

**Capital Works Management Framework**  
***Guidance Note***

**Planning and Control of Capital Costs**

**GN 2.2**

Planning and Control of Capital Costs

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## Foreword

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### Purpose of this document

This document deals with the planning and control of capital budgets for public works projects, both building and civil engineering, through all stages in the design process. It is one of a number of guidance notes aimed at facilitating the implementation of the measures in the Capital Works Management Framework (CWMF) introduced to achieve greater cost certainty and better value for money on publicly funded projects.

See *Design Development Process* (GN 2.1) for more information on how design is progressed.

#### **Traditional and design-and-build projects**

This guidance note deals with design conducted by Clients in both traditional (Employer-designed) projects and in design-and-build (Contractor-designed) projects. In the case of the latter, however, much or all of the design and the accompanying cost control is carried out by the Contractor; so for that reason, this guidance note is only relevant to cost management and design work carried out by the Client before the design risk is transferred to the Contractor under a design and build contract.

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### Audience

This document is intended primarily for the guidance of Sponsoring Agencies embarking on capital works projects. However, the role of the Sanctioning Authorities and any external consultants appointed in relation to the capital works projects is also considered.

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### Terminology in this guidance note

The **Sponsoring Agency** becomes the **Contracting Authority** for a project once it becomes a party to any contract relating to the project. And from the time the Works Contract is signed, the Sponsoring Agency is referred to as the **Employer**. The term **Client** is used throughout this guidance note as a generic term to cover the Sponsoring Agency / Contracting Authority / Employer.

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### References in this document

Throughout this document references are made to other documents, including other guidance notes. These references should be understood as referring to the most up to date version in each case.

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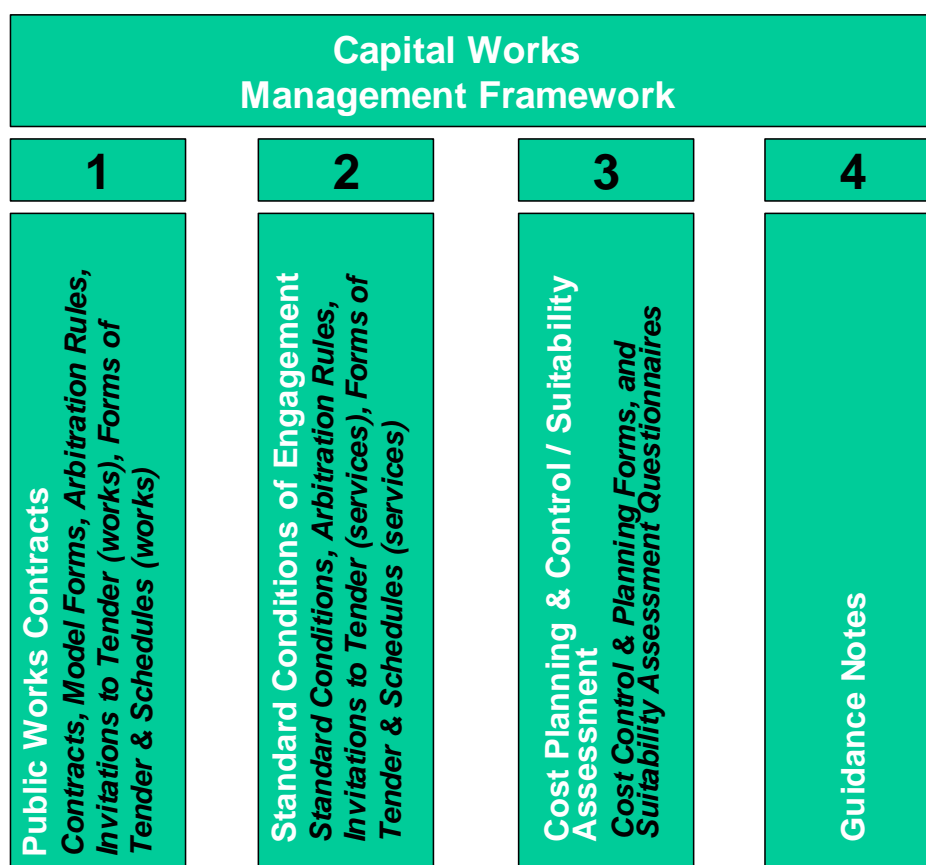
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## Foreword, Continued

### What is the Capital Works Framework

The Capital Works Management Framework (CWMF) is a structure that has been developed to deliver the Government's objectives in relation to public sector construction procurement reform. It consists of a suite of best practice guidance, standard contracts and generic template documents that form four pillars that support the Framework; the pillars are:

1. A suite of standard forms of construction contracts and associated model forms, dispute resolution rules, model invitations to tender, forms of tender and schedules;
2. The standard conditions of engagement for consultants, dispute resolution rules, model invitations to tender, forms of tender and schedules;
3. Standard templates to record cost planning and control information; and for suitability assessment; and
4. Extensive guidance notes covering the various activities in a project delivery process.



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## Foreword, Continued

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### What is the Capital Works Framework (continued)

The content of the four pillars is outlined below. The constituent documents are coded according to the following scheme:

<b>Code</b>	<b>Description</b>	<b>Code</b>	<b>Description</b>
PW-CF	Public Works Contract Form	COE	Standard Conditions of Engagement
MF	Model Form	GN	Guidance Note
AR	Arbitration Rules	CO	Cost Planning / Control Form
ITTS	Invitation To Tender, Services	ITTW	Invitation To Tender, Works
QC	Questionnaire: Suitability Assessment for Service Provider	QW	Questionnaire: Suitability Assessment for Works Contractor
FTS	Form of Tender and Schedule	GL	Glossary
WE	Data on Weather Events		

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### CWMF Pillar 1 **Public Works Contracts**

Contracts, Model Forms, Arbitration Rules, Invitations to Tender (works), and Forms of Tender & Schedules (works)

<b>Contracts</b>	
PW-CF1	Public Works Contract for Building Works designed by the Employer
PW-CF2	Public Works Contract for Building Works designed by the Contractor
PW-CF3	Public Works Contract for Civil Engineering Works designed by the Employer
PW-CF4	Public Works Contract for Civil Engineering Works designed by the Contractor
PW-CF5	Public Works Contract for Minor Building and Civil Engineering works designed by the Employer
PW-CF6	Public Works Short Form of Contract
PW-CF7	Public Works Investigation Contract
PW-CF8	Public Works Short Form of Investigation Contract
PW-CF9	Public Works Framework Agreement
<b>Weather Events</b>	
WE 1.0	Met Éireann's calculations of Weather Events

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## Foreword, Continued

### CWMF Pillar 1 (continued)

<b>Model Forms</b>	
MF 1.0	<i>Model Forms (compendium of all model forms)</i>
MF 1.1	<i>Bid Bond</i>
MF 1.2	<i>Letter to Apparently Unsuccessful Tenderer</i>
MF 1.3	<i>Letter of Intent</i>
MF 1.4	<i>Letter of Acceptance</i>
MF 1.5	<i>Letter to Tenderers Notifying Award</i>
MF 1.6	<i>Performance Bond</i>
MF 1.7	<i>Parent Company Guarantee</i>
MF 1.8	<i>Novation and Guarantee Agreement</i>
MF 1.9	<i>Novation Agreement</i>
MF 1.10	<i>Appointment of Project Supervisor</i>
MF 1.11	<i>Professional Indemnity Insurance Certificate</i>
MF 1.12	<i>Collateral Warranty</i>
MF 1.13	<i>Rates of Pay and Conditions of Employment Certificate</i>
MF 1.14	<i>Bond – Unfixed Works Items</i>
MF 1.15	<i>Retention Bond</i>
MF 1.16	<i>Appointment of Conciliator</i>
MF 1.17	<i>Bond – Conciliator's Recommendation</i>
<b>Arbitration Rules</b>	
AR 1.0	<i>Arbitration Rules</i>
<b>Invitations to Tender (works)</b>	
ITTW 1	<i>Invitation to Tender for Works, Restricted Procedure</i>
ITTW 2	<i>Invitation to Tender for Works, Open Procedure</i>
ITTW 3	<i>Invitation to Tender, Investigation Contract under an Open Procedure</i>
<b>Forms of Tender and Schedules</b>	
FTS 1	<i>Form of Tender and Schedule: Public Works Contract for Building Works designed by the Employer</i>
FTS 2	<i>Form of Tender and Schedule: Public Works Contract for Building Works designed by the Contractor</i>
FTS 3	<i>Form of Tender and Schedule: Public Works Contract for Civil Engineering Works designed by the Employer</i>
FTS 4	<i>Form of Tender and Schedule: Public Works Contract for Civil Engineering Works designed by the Contractor</i>
FTS 5	<i>Form of Tender and Schedule: Public Works Contract for Minor Building and Civil Engineering Works designed by the Employer</i>
FTS 6	<i>Form of Tender and Schedule: Public Works Short Form of Contract</i>
FTS 7	<i>Form of Tender and Schedule: Public Works Investigation Contract</i>
FTS 8	<i>Form of Tender and Schedule: Public Works Short Form of Investigation Contract</i>

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# Foreword, Continued

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## CWMF Pillar 2 **Standard Conditions**

Standard Conditions of Engagement, Arbitration Rules, Invitations to Tender (services), and Forms of Tender & Schedules (services).

<i>Standard Conditions</i>	
COE 1	<i>Standard Conditions of Engagement for Consultancy Services (Technical)</i>
COE 2	<i>Standard Conditions of Engagement for Archaeology Services</i>
<i>Arbitration Rules</i>	
AR 1.0	<i>Arbitration Rules</i>
<i>Invitations to Tender (services)</i>	
ITTS 1	<i>Invitation to Tender for Services, Restricted Procedure</i>
ITTS 2	<i>Invitation to Tender for Services, Open Procedure</i>
<i>Forms of Tender &amp; Schedule (services)</i>	
FTS 9	<i>Form of Tender and Schedule, Consultancy Services (Technical)</i>
FTS 10	<i>Form of Tender and Schedule, Archaeology Services</i>

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## Foreword, Continued

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### CWMF Pillar 3 **Cost Planning & Control/ Suitability Assessment**

Cost Control & Planning Forms; and Suitability Assessment Forms for works and services.

<b>Cost Planning &amp; Control Forms</b>	
CO 1	<i>How to Use the Costing Document (Building Works) Template</i>
CO 1.1	<i>Costing Document (Building Works)</i>
CO 2	<i>How to Use the Costing Document (Civil Engineering Works) Template</i>
CO 2.1	<i>Costing Document (Civil Engineering Works, Roads)</i>
CO 2.2	<i>Costing Document (Civil Engineering Works, Water Sector)</i>
CO 2.3	<i>Costing Document (Civil Engineering Works, Marine)</i>
<b>Suitability Questionnaires (works)</b>	
QW 1	<i>Questionnaire: Suitability Assessment for Works Contractor, Restricted Procedure</i>
QW 2	<i>Questionnaire: Suitability Assessment for Works Contractor, Open Procedure</i>
QW 3	<i>Questionnaire: Suitability Assessment for Works Specialist for specialist area</i>
<b>Suitability Questionnaires (services)</b>	
QC 1	<i>Questionnaire: Suitability Assessment for Service Provider, Restricted Procedure</i>
QC 2	<i>Questionnaire: Suitability Assessment for Service Provider, Open Procedure</i>
QC 3	<i>Questionnaire: Suitability Assessment for Service Provider, Independent PSDP</i>
QC 4	<i>Questionnaire: Suitability Assessment for Service Provider, Independent PSCS</i>

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## Foreword, Continued

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### CWMF Pillar 4 **Guidance Notes**

<b>Guidance Notes</b>	
GN 1.0	<i>Introduction to the Capital Works Management Framework</i>
<b>GN 1.1</b>	<b>Project Management</b>
GN 1.2	<i>Project Definition and Development of the Definitive Project Brief</i>
GN 1.3	<i>Budget Development</i>
GN 1.4	<i>Procurement and Contract Strategy for Public Works Contracts</i>
GN 1.5	<i>Public Works Contracts</i>
GN 1.6	<i>Procurement Strategy for Consultancy Services (Technical)</i>
GN 1.6.1	<i>Assessment of Construction Service Providers, Restricted Procedure</i>
GN 1.6.2	<i>Assessment of Construction Service Providers, Open Procedure</i>
GN 1.7	<i>Standard Conditions of Engagement, Guidance Note and Sample Schedules</i>
GN 2.1	<i>Design Development Process</i>
<b>GN 2.2</b>	<b>Planning and Control of Capital Costs <sup>1</sup></b>
GN 2.3	<i>Procurement of Works Contractors</i>
GN 2.3.1	<i>Assessment of Works Contractors, Restricted Procedure</i>
GN 2.3.2	<i>Assessment of Works Contractors, Open Procedure</i>
GN 2.4	<i>Tender Process</i>
GN 3.1	<i>Implementation Process</i>
GN 4.1	<i>Project Review</i>
<b>Glossary</b>	
GL 1.0	<i>Glossary</i>

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<sup>1</sup> The current guidance note.

## Foreword, Continued

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### Strategic Objectives of the CWMF

The strategic objectives of the Government's Capital Works Management Framework are to ensure:

- Greater cost certainty at contract award stage;
- Better value for money at all stages during project delivery, particularly at handover stage; and
- More efficient end-user delivery.

Provided there is a comprehensive definition of the Client's requirements in terms of output specifications, and adequate pre-tender detail design input (in the cast of traditional contracts), the new public works contracts will enable the key objectives outlined above be achieved. The degree to which output specifications and the pre-tender detailed design input is developed is determined by the following guiding principles which underpin the new contracts:

- To ensure as far as practicable that the accepted tender prices and the final outturn costs are the same; and
- To allocate risk so that there is optimal transfer of risk to the Contractor.

The public sector Client or is called 'the Employer' in the new public works contracts. The achievement of optimal risk transfer is dependent on the Employer providing complete and detailed information in the tender documentation:

- For design-and-build projects, the Employer must provide detailed output specifications; and
- For traditional projects, the Employer must provide comprehensive input designs and specifications

Then in responding to an invitation to tender, prospective contractors can assess the impact of the risks being transferred and build the costs of such risks into their tender price.

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### Content

The topics dealt with in this document are as follows:

Chapter	See Page
<b>1: Introduction to Cost Control</b> Deals with principles of capital cost planning and controlling costs.	14
<b>2: Cost Control in Design Development</b> Deals with capital cost planning and control in the design development phase	34

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## Foreword, Continued

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### Content (continued)

Chapter	See Page
<b>3. Whole Life Cost Appraisal</b> Deals with tasks in whole life cost appraisal	54
<b>4. Managing Corrective Action and Change Control</b> Deals with procedure for budget change	56
<b>5. Risk Management Tasks</b> Deals with risk management tasks relating to cost control	60
<b>Appendix: Standard Templates for Cost Planning and Control</b> Deals with the use of standard templates for the main cost report activities and their output documents.	64

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# Project Stages

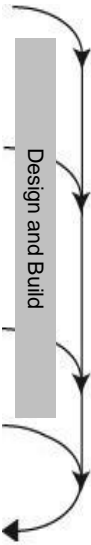
# Capital Works Management Framework

## Main Project Processes

Project Stages		Project Management	Design Activities (Building)	Design Activities (Civil Eng.)	Cost Control Activities	Risk and Value Management	Documents for Approval	
Appraisal								
Approval in Principle								
Stage 1 <i>Initial</i>	Stage I <i>Feasibility Study / Preliminary Report</i>	Manage outputs: Project Definition (through 16 N° overall parameters)	Conduct Feasibility Studies Develop <i>Definitive Project Brief</i>	Conduct Preliminary Report Conduct design studies Develop <i>Definitive Project Brief</i>	Conduct cost assessment of Feasibility Studies / Preliminary Report (capital and maintenance costs)	VM: Confirm strategic functional performance Review Feasibility Studies / Preliminary Report options Identify VM strategies Develop functional performance model RM: Identify and assess risk relating to the <i>Project Execution Plan</i> Develop high-level <i>Risk Management Plan</i>	<i>Project Management Structure</i> <i>Preliminary Project Brief</i> <i>Preliminary Output Specification</i> <i>Feasibility Study and Cost Plan</i> <i>Design Brief</i> <i>Final Output Specification</i> <i>Definitive Project Brief</i> <i>Project Execution Plan</i> <i>Risk Management Plan</i>	
		Manage technical experts' appointment (if required)	Appoint technical experts (if required) Appoint PSDP (if required)	Appoint technical experts (if required) Appoint PSDP (if required)				
	Stage II <i>Design</i>	<b>Project Review 1: Confirm approval for design expenditure</b> (Report to Sanctioning Authority and await approval prior to proceeding)						
		Manage procurement strategy Manage design consultant appointment Manage assessment of output requirements	Appoint Design Team / Design Team Leader Assess output requirements	Appoint Design Team / Lead Consultant Develop design standards Assess output requirements	Check / assess budget	VM: Consider VM in relation to procurement strategy RM: Identify risk in relation to procurement Agree risk allocation	<i>Definitive Procurement Strategy</i> <i>Contract Type Proposal</i> <i>Project Team Selection Report</i>	
		<b>Project Review 2: Confirm requirements; review procurement strategy</b> ( Certify compliance to Sanctioning Authority; and proceed after agreed period provided no queries / hold from Sanctioning Authority)						
		Manage Outline Design process	Develop <i>Outline Sketch Scheme</i> Appoint PSDP (if not appointed earlier)	Develop Preliminary Planning Appoint PSDP (if not appointed earlier)	Develop <i>Outline Cost Plan</i>	VM: Consider VM in relation to Outline Sketch Scheme / Preliminary Planning RM: Consider RM in relation to Outline Sketch Scheme	<i>Outline Sketch Scheme (Building)</i> <i>Preliminary Planning drawings (C. Eng.)</i> <i>Outline Cost Plan</i>	
		<b>Project Review 3: Assess project design and Outline Cost Plan</b> ( Certify compliance to Sanctioning Authority; and proceed after agreed period provided no queries / hold from Sanctioning Authority)						
		Manage Developed Design process Manage procurement process	Develop <i>Developed Sketch Scheme</i> Prepare submission for statutory approval	Continue Preliminary Planning Prepare submission for statutory approval	Develop <i>Developed Cost Plan</i> Develop <i>Whole Life Cost Appraisal</i>	VM: Carry out value engineering Assess buildability of the design Consider VM in relation to <i>Detailed Sketch Scheme</i> RM: Identify residual risks Consider RM in relation to <i>Detailed Sketch Scheme</i> Suitability assessment of contractors	<i>Developed Sketch Scheme</i> <i>Developed Cost Plan</i> <i>Statutory Approval Submission</i>	
		<b>Project Review 4: Assess project prior to statutory approval</b> (Report to Sanctioning Authority and await approval prior to proceeding)						
		Manage statutory submission process	Submit for statutory approval Review statutory approval outcome	Submit for statutory approval Review statutory approval outcome	Review <i>Developed Cost Plan</i>	VM: Review any planning conditions for value management impact. RM: Review any planning conditions for risk impact.	<i>Developed Cost Plan (reviewed)</i>	
<b>Project Review 5: Assess outcome from statutory approval</b> ( Certify compliance to Sanctioning Authority; and proceed after agreed period provided no queries / hold from Sanctioning Authority)								
Stage 2 <i>Planning Developed</i>	Stage III <i>Tender</i>	Manage the Detailed Design Process	Develop Detailed Design (not design-and-build) Prepare tender documents	Develop Detailed Planning (Design) (not design-and-build) Prepare tender documents	Conduct <i>Detailed and Pre-Tender Cost Checks</i> and <i>Whole Life Cost Update</i> in advance of preparing tender documents	VM: Review suitability assessment of contractors for VM potential RM: Review suitability assessment of contractors for risk impact	<i>Tender Documentation</i> <i>Detailed Pre-tender Cost Check</i> <i>Whole Life Cost Update</i> <i>Contractor List Selection</i>	
		<b>Project Review 6: Approve detailed design solution; review pre-tender cost check; review risk</b> (Report to Sanctioning Authority and await approval prior to proceeding)						
	Manage the Tender Process	Issue tender documents Assess tender returns Recommend successful tenderer	Issue tender documents Assess tender returns Recommend successful tenderer	Develop <i>Tender Cost Analysis</i> Develop <i>Tender Report</i>	VM: Assess tender returns for VM potential RM: Assess tender returns for risk impact	<i>Tender Assessment Criteria</i> <i>Tender Analysis And Report</i> <i>Contractor Recommendation</i>		
	<b>Project Review 7: Review tender returns in advance of awarding the contract</b> (Report to Sanctioning Authority and await approval prior to proceeding)							
Stage 3 <i>Implementation</i>	Stages IV and V <i>Construction and Handover</i>	Manage the implementation / construction process Manage change control Manage contract	Develop Detailed Design (Design and Build) Implement design	Develop Detailed Planning (Design and Build) Implement design	Manage change control for costs Prepare final account	VM: Carry out value engineering (for design and build projects only) RM: Manage residual risk Manage construction risk	Various contract management reports	
Stage 4 <i>Review</i>		Manage th Project Review	Conduct design review	Conduct design review	Develop <i>Analysis of Outturn Cost</i>	VM: Evaluate value achieved RM: Evaluate the risk management and risk mitigation process Consider operational risk reviews	<i>Project Outturn Review</i>	

Capital Appraisal

Standard Conditions of Engagement



# 1: Introduction to Cost Control

## 1.1 Overview

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### Stages in capital works management

The four major stages in the delivery life cycle of a public works project are set out in the Department of Finance's *Guidelines for the Appraisal and Management of Capital Expenditure Proposals in the Public Sector* (February 2005). The four stages are:

	Stage	What happens
Capital Works Management	<b>1. Appraisal</b>	The needs are identified, the broad parameters of a solution are agreed, and a decision-in-principle is made to proceed.
	<b>2. Planning</b>	The needs are quantified and assumptions verified, the desired outputs are specified, and the solution is designed.
	<b>3. Implementation</b>	The solution is constructed.
	<b>4. Post-project review</b>	An assessment is carried out of how successfully the delivered solution addresses the needs.

The planning and control of capital costs activities described in this guidance note take place during the Planning stage.

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### Purpose of capital cost planning and control

The planning and control of capital costs is a key requirement of good governance and should be a priority for all capital works projects.

The primary aim of implementing cost planning and cost control procedures in the management of capital projects is to ensure that cost certainty and value for money are achieved.

By adopting best practice procedures in the management of capital expenditure through the use of cost planning and cost control, the Project Coordinator can minimise the financial risks involved in undertaking capital works projects.

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## 1.1 Overview, Continued

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### Definitions of 'cost control' and 'cost planning'

#### **Cost planning**

For the purposes of this document, the planning of capital costs or 'cost planning' as it is more commonly known can be defined as *a system of integrating cost-based intelligence into the design process.*

To maximise its value, cost planning should be based on a series of cost holding categories appropriate for a particular project design. Each cost holding category should be allocated a value (a target cost) that represents a reasonable proportion of the budget and also represents value for money. The aggregate value of the target costs should not exceed the overall approved budget for the project. Once an Outline Cost Plan is established, the cost holding categories should be continually assessed to ensure that the integrity of the project budget continues to hold true.

#### **Cost control**

For the purposes of this document 'cost control' can be defined as *the management of the costs associated with the design process (in each cost holding category) to achieve a predefined approved capital budget.*

Continuous assessment of the cost holding categories during the Planning Developed stage (including preparation of tender documentation) will test the robustness of the costs in these categories that make up the approved budget.

Cost control is dependent on two key factors: information and action. In order to have successful cost control, it is essential to have the necessary information and to take appropriate action based on that information. If the relevant information is not available or if the required action is inefficiently executed, then the risk to cost control on a project is raised considerably.

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## 1.1 Overview, Continued

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### Scope of costs for inclusion

The costs covered by this guidance document are those capital costs properly accruing to the Sponsoring Agency and /or the Sanctioning Authority in connection with public works projects. The costs can be divided into two distinct categories:

Category	Description
<b>1. Capital costs</b>	Capital costs are those costs that are necessarily incurred in providing and equipping a construction facility. They do <i>not</i> include any costs properly chargeable to current expenditure – for example, expense costs such as rent for temporary accommodation.  For a more detailed, although not exhaustive, listing of project costs, see <i>Budget Development</i> (GN 1.3).
<b>2. Whole life costs</b>	In addition to all capital costs as outlined above, whole life cost includes all costs incurred with a planned maintenance programme and operational costs over the functional life of a facility. Whole life cost is expressed in terms of net present value.  See Chapter 3 below for more information on whole life costs.

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### Contents

This chapter covers four topics as follows:

Topic	See Page
<b>1.2 Project Reviews and Capital Cost Planning and Control</b> Describes how capital cost planning and control integrates with the project review cycle.	17
<b>1.3 Critical Success Factors</b> Outlines some of the critical success factors relating to cost planning and control on a project.	21
<b>1.4 Managing Value and Complexity</b> Deals with managing projects with different profiles in relation to risk, value and whole life cost.	25
<b>1.5 Cost Control in Design Development – Roles and Responsibilities</b> Outlines the roles and responsibilities of the Sanctioning Authority, the Sponsoring Agency and the Design Team in relation to cost planning and control.	28

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## 1.2 Project Reviews and Capital Cost Planning and Control

### Overview

Project Reviews are a means to allow Sponsoring Agencies ensure their projects remain on track to deliver their objectives (see Process Map). There is a direct correlation between Project Reviews 3 to 7 and the cost planning and cost control activities that are carried out in the Planning Initial and Developed stages in the delivery life cycle of a public works project. Cost planning and control is an activity that takes place between project reviews, and its overall output is a key determining factor at review stage in deciding whether or not a project proceeds to the next stage or is sent back for reassessment.

The Cost Planning and Control Activity ...		.. is aligned with:
Outline Cost Plan		Project Review 3
Developed Cost Plan/Outline Cost Plan (revised)		Project Review 4
<i>Building:</i> Developed Cost Plan	<i>Civil Engineering:</i> Outline Cost Plan (revised) – amended following statutory approval	Project Review 5
<i>Building:</i> Pre-Tender Cost Check Price Pricing Document and update Developed Cost Plan [revised]	<i>Civil Engineering:</i> Pre-Tender Cost Check Price Pricing Document and update Outline Cost Plan [revised]	Project Review 6
Tender Cost Analysis		Project Review 7

### Project reviews and procurement strategy

Project reviews 1 to 7 are all appropriate to traditional, Employer-designed projects. For design-and-build projects, Project reviews 1, 2 and 7 are always appropriate. Project Reviews 3, 4, 5 and 6 are appropriate only while the Client continues to retain the design risk.

	Traditional / Employer-designed	Design and-build / Contractor-designed
Project Review 1	✓	✓
Project Review 2	✓	✓
Project Review 3	✓	Appropriate only while the Client retains the design risk.
Project Review 4	✓	
Project Review 5	✓	
Project Review 6	✓	
Project Review 7	✓	✓

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## 1.2 Project Reviews and Capital Cost Planning and Control, Continued

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### Project Review 1

Project Review 1 is a mandatory **red light review** that takes place after the Definitive Project Brief (and design standards, in the case of civil engineering projects) has been developed when approval for design expenditure is needed. Its function is to confirm that the project is in line with the Approval in Principle, that the preferred design option is capable of being further developed through the design and statutory process, and that delivery of the project is realistic relative to the detailed budget set when the Approval in principle was granted.

If Project Review 1 reveals a conflict with the project appraisal or the assumptions underlying the Approval in Principle, or if support for the preferred project solution cannot be obtained, then project work should be suspended and the project should be referred back to the Appraisal stage for reassessment..

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### Project Review 2

Project review 2 is an **amber light review** which takes place after the procurement strategy is agreed and the Design Team has been appointed.

The purpose of this review is for the Design Team to check that the requirements (as specified in the Definitive Project Brief and after design standards have been established [civil engineering]) and the approved budget are adequate and to review the procurement strategy.

Conducting Project Review 2 is one of the first tasks undertaken by the Design Team after their appointment. It takes place before the commencement of any design work and before any formal planning and cost control activities associated with such work are initiated. During the review, the budget might be found to be inadequate or excessive:

<b>Inadequate budget</b>	If the Design Team finds that the budget is inadequate, they should quantify the deficit and seek an increase in the budget from any contingency monies that the Sponsoring Agency might have. (See Chapter 4 for details of the change control mechanisms that are appropriate in such a situation.) Alternatively, the project should be referred back to the Appraisal stage for reassessment.
<b>Excessive budget</b>	If the Design Team finds that the capital budget is in excess of what is required, they should quantify and report the excess to the Sponsoring Agency who should remove it from the budget.

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## 1.2 Project Reviews and Capital Cost Planning and Control, Continued

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### Start of Cost Planning and Cost Control Activities

Following a positive outcome to Project Review 2, the Sponsoring Agency certifies compliance to the Sanctioning Authority. After a period of time (agreed beforehand with the Sanctioning Authority), the Sponsoring Agency instructs the Design Team Leader / Lead Consultant in writing to proceed with the project in accordance with Stage (ii) Design in Schedule B of the Conditions of Engagement, (including cost planning and control activities) – provided the Sanctioning Authority has no queries and does not issue an instruction to put the project on hold.

The detailed project budget has already been developed, checked and verified by the Design Team as part of Project Review 2, and a framework for cost planning and control can now be established – this is the first formal step in cost planning and control activities as described in this guidance note. The framework is based on best practice, as outlined in the guidance note *Budget Development* (GN 1.3) and extends to the start of the tendering process.

**Note:** In some projects the detailed budget may have been developed to an advanced stage earlier during the Appraisal stage – this is to facilitate the making of the approval in principal decision.

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### Project Reviews 3 – 6

The Cost Planning and Control elements of Project Reviews 3 – 6 are described in more detail below:

- For Project Review 3, see 2.3 The Outline Cost Plan and Related Activities on page 36;
- For Project Review 4, see 2.4 Developed Cost Plan / Outline Cost Plan (revised) and Related Activities on page 42;
- For Project Review 5, see 2.5 Review of Developed Cost Plan / Outline Cost Plan (revised) on page 46; and
- For Project Review 6, see 2.6 Detailed Cost Check and Pre-Tender Cost Check on page 48.

Project Review 7 takes place after the tender returns have been reviewed and in advance of the contract award. Discussion of Project Review 7 is not germane to this guidance note. For more information, see *Tender Process* (GN 2.4).

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## 1.2 Project Reviews and Capital Cost Planning and Control, Continued

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### **Design-and-build: transferring risk to the Contractor**

For design-and-build projects, the Sponsoring Agency may decide to cease design work after Project Review 2 and to transfer complete design and statutory approval risk to the successful design-and-build Contractor who emerges from the tender process. In this case, the management and establishment of project costs transfer initially to the design-and-build tenderers and ultimately to the successful Contractor that emerges at the end of the tender process. The Design Team will continue to remain in place to:

- Prepare tender documents (based on the Sponsoring Agency's output requirements, and pricing templates) for design-and-build tenderers;
- Evaluate tender designs and prices when they come in; and
- Monitor construction, administer the contract and settle the final account (where they have not been novated to the design and build contractor).

The Sponsoring Agency will also be required to appoint a Project Supervisor for the Design Process (PSDP) to address Health and Safety design issues in the tender documents for more information see *Design Development Process* (GN 2.2).

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## 1.3 Critical Success Factors

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### Introduction

Robust cost planning and strong cost control are dependent on a wide range of factors that can change in importance throughout the design life cycle of a project. However, there are a number of critical success factors that have a determining role; these include:

- The quality of the Definitive Project Brief and the detailed budget;
- Deciding on a clear procurement strategy;
- Appointing skilled Cost Advisers;
- Identifying a detailed and clear list of assumptions and exclusions;
- Clear procedures for risk management and change management
- Project Programme (design and tender process stages)

Each of these factors is described below.

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### Detailed budget and Definitive Project Brief

The detailed budget is formulated at Definitive Project Brief stage within the approved budget limits for which the approval in principle was granted. If the budget has already been broken down to a level of detail at Appraisal stage (in advance of the approval in principle), then it must be reassessed at the Definitive Project Brief stage to confirm that all cost conclusions arrived at earlier continue to hold true.

The detailed budget acts as the foundation stone for costs on a capital project. For a number of reasons, it is very important to get the detailed budget right before design work starts.

- To avoid project delays / abandonment that might arise from lack of funding
- To preempt the risk of good value for money not being achieved; and
- To ensure that quality standards do not suffer.

The guidance document *Budget Development* (GN 1.3) sets out procedures for establishing the overall budget.

In addition to establishing a detailed budget, the Definitive Project Brief should also be a clear, comprehensive and explicit statement of the user requirements, function, specification and physical output which form the basis of a project design.

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## 1.3 Critical Success Factors, Continued

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### Procurement Strategy

The procurement strategy appropriate to a project is decided after Project Review 1, during the Planning Initial stage. The choice of procurement strategy is the key determinant of who is to be responsible for design:

<b>Employer</b>	An <i>Employer-designed</i> (or ‘ <i>traditional</i> ’) project is one where the Contractor is responsible for providing the construction services to deliver a facility designed by (or on behalf of) the Client (Employer).
<b>Contractor</b>	A <i>Contractor-designed</i> (or ‘ <i>design-and-build</i> ’) project is one where the Contractor is responsible (subject to the terms of contract) for the design, management and delivery of the project, on time and within the contract sum, taking into account whole-life costs and fitness for purpose in accordance with a predefined output specification provided by the Client (Employer)

The Definitive Project Brief (and design standards, in the case of civil engineering projects) is the basis for project design – irrespective of whether the design is to be performed by the Employer or by the successful Contractor who emerges from the tender process.

For more information on the criteria on which the choice of procurement strategy for a particular project might be based, see *Procurement Strategy for Public Works Contracts* (GN 1.4).

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### Skill base of Cost Advisers

To carry out proper cost planning and cost control on a project it is essential that expert Cost Advisers are appointed to carry out this work – either from within the Client body or externally. These advisers should be appointed at the earliest possible stage (preferably at the same time as the appointment of the Design Team) and their responsibilities should be clearly assigned.

Cost Advisers must be skilled in the areas of cost management; value management; and risk management, including whole life cost analysis. Ideally, they should have experience of projects of a similar size, nature and complexity to that proposed.

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### Assumptions and exclusions

At all stages in the design process it is essential that costs are reported comprehensively, with a clear list of assumptions on which the budgetary figures are based, and any items that are excluded. Such assumptions and exclusions should normally be standard for the project type and they should be acceptable in relation to the context of the project.

Sanctioning Authorities and Sponsoring Agencies should maintain a central list of acceptable items that may be excluded from cost reports.

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## 1.3 Critical Success Factors, Continued

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### Risk and contingency management

The management of risk is critical to the success of any cost planning and control exercise. Risk management requires a high level of skill in the identification, quantification, mitigation and financial assessment of project risks. In the case of traditional contracts, the combination of mitigation measures and financial assessment will play an important management role throughout the life cycle of the project design.

Contingency management and risk management on a traditional project are inextricably linked to each other and the refinement and resolution of both these elements is also linked to the Project Programme (design and tender processes). Both contingency and risk must be managed in tandem to ensure the smooth and orderly transition of a project through its various design stages.

See chapter 6 of *Project Management* (GN 1.1) for details of the role of risk management in the life cycle of a project.

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### Change management

There should be no major change in scope to a project once the user requirements, function, specification and physical output which forms the basis of a project design are established in the Definitive Project Brief.

In a situation where a necessary change in project scope is identified during the design process, it should first be approved by the Sanctioning Authority and then managed in such a way so as to minimise the extent of the design work that has to be redone.

If a change in project scope becomes necessary during the construction stage, it is essential that this is managed within a rigorous verification procedure that is fully compliant with the contract conditions. Any major changes to a project must be approved by the Sanctioning Authority before the project may proceed.

See Chapter 4 for details relating to change management.

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## 1.3 Critical Success Factors, Continued

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### Project Programme

There are two factors that require consideration in relation to cost and time during the design and tender processes. The first is the ongoing refinement of the design and specifications leading to greater cost certainty and less reliance on the contingency allowance as the project moves through the design process. The second is the clear correlation between the cost of a project and the time it takes to complete the design and tender processes. For that reason it is essential that the Project Programme for the design and tender processes is properly managed with appropriate project management tools to ensure that deadlines are strictly adhered to.

The total performance period for the project is established at the time the Design Team is appointed, along with the individual performance periods for each service stage of the project (including the design and tender processes). For each project, these are set out in Schedules A and B of the *Standard Conditions of Engagement for Consultancy Services (Technical)* (COE 1).

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## 1.4 Managing Value and Complexity

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### Appropriate measures

It is important to recognise that the time and money invested in cost planning and control exercises should be appropriate to the value and complexity of the project. Projects with a high value and a high complexity require different procedures to those with low value or low complexity.

#### **Value threshold**

For the purposes of this guidance note, the low value threshold is €5 million (ex. VAT) in line with the threshold for the use of the Public Works Contract for Minor Building and Civil Engineering works designed by the Employer (PW-CF 5) and the Public Works Short Form of Contract (PW-CF 6) – see 1.2.2 Traditional Contracts in *Public Works Contracts* (GN 1.5).

#### **Measuring complexity**

Project complexity is more difficult to quantify and differs from sector to sector. For this reason the general guidance would be that low complexity would involve a project with a simple low level design requirement and a clear, accessible, independent and vacant site whereas high complexity could involve intricate high level design input and/or a difficult site and/or interfacing with existing live facilities. It is envisaged that, other than in exceptional cases, projects under €1 million will fall into Category 1 – Low Value / Low Complexity.

Each Sanctioning Authority should set specific guidelines on project complexity within their sector as guidance to Sponsoring Agencies.

**Note:** As with the forms of contract it is open to Sponsoring Agencies to adopt the procedures for high-value projects or low-value projects as they consider appropriate.

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## 1.4 Managing Value and Complexity, Continued

### Value / complexity threshold

The following diagram presents a value/complexity matrix, with indications of the different management levels that apply to each.

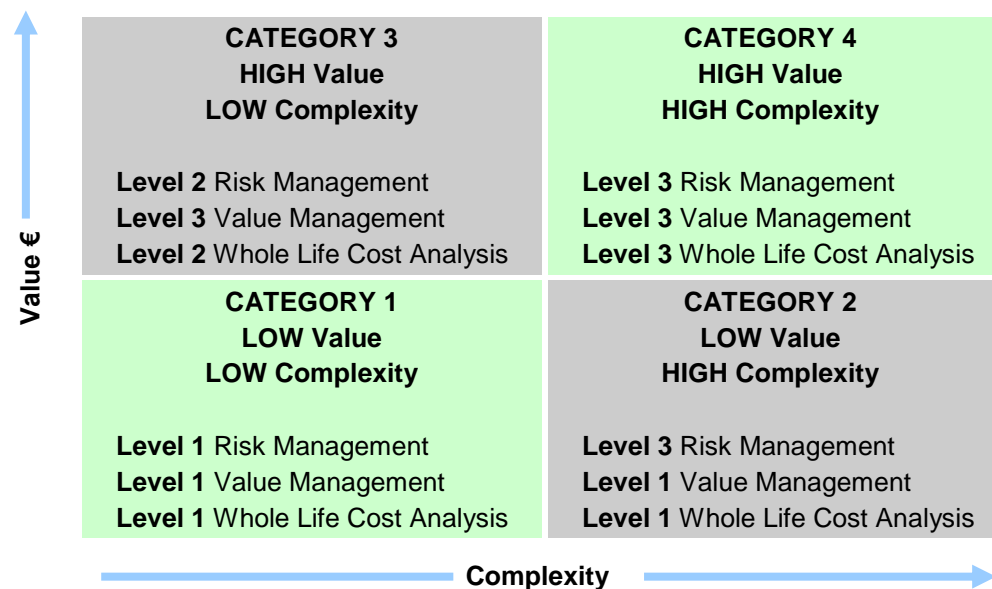


Figure 1: Value / complexity matrix

Details of levels that apply to risk management, value management and whole life costs analysis are listed below.

### Risk management levels

The following is a summary of the levels appropriate for risk management.

Level 1	Level 2	Level 3
Risk Management should be a constant agenda item at Design Team meetings. With the cooperation of the Design Team, the risks should be identified and discussed, and strategies should be developed to minimise, mitigate or manage the risk	Level 1 procedures – plus – Establish a formal Risk Register with the nature of each risk defined, quantified and valued, and a strategy for dealing with each of them should be developed.	Level 1 and 2 procedures – plus – Run Risk Workshops using an experienced risk management expert not directly involved in the project.

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## 1.4 Managing Value and Complexity, Continued

### Value management levels

The following is a summary of the levels appropriate for value management.

Level 1	Level 2	Level 3
In addition to the cost/m <sup>2</sup> , cost/km, unit cost etc., benchmarks as a basis for estimation the benchmark should also be used as a tool for reviewing value for money compared to other updated similar projects.	Level 1 procedures – <i>plus</i> – Other benchmarking tools should be used including Functional Analysis to understand the Sponsoring Agency's interpretation of Value. Value engineering option appraisal should also be carried out.	Level 1 and 2 procedures – <i>plus</i> – Run Value Management Workshops that focus on value for money as part of an ongoing process. This involves a review of the design to identify areas of improvements.

### Whole life costs analysis levels

The following is a summary of the levels appropriate for whole life costs analysis.

Level 1	Level 2	Level 3
As a matter of best practice, ensure that affordable, sustainable design solutions are included.	Level 1 procedures – <i>plus</i> – Develop a Schedule of Whole Life Cost options with indicative orders of costs and payback terms for review with the Sponsoring Agency.	As Level 2 procedures with increased analysis proportionate to the project size..

## 1.5 Cost Control in Design Development – Roles and Responsibilities

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### Overview

The roles and responsibilities of the Sanctioning Authority, the Sponsoring Agency (including the Project Coordinator) and the Design Team in relation to cost control during the design development process are detailed below.

See *Design Process* (GN 2.1) for details of roles and responsibilities in relation to design development.

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### Sanctioning Authority: roles and responsibilities

It is the Sanctioning Authority's role to determine the outcome of any issue which impacts on a project arising out of a change in any of the components or circumstances on which the Approval in Principle was based. The Sanctioning Authority's particular responsibilities in relation to Project Reviews are outlined below.

#### **Project Reviews and the Sanctioning Authority**

Project Reviews 1, 4, 6 and 7 are red reviews **red light reviews**. These require the Sponsoring Agency to prepare a report for the Sanctioning Authority to approve in order for the project to proceed further. The report enables the Sanctioning Authority to evaluate the business case and the project parameters, to confirm the budget, and to determine whether or not the project should proceed.

Project Reviews 2, 3 and 5 are **amber light reviews**. These require formal collection and reporting of evidence within the Sponsoring Agency and the Design Team to confirm that the project is on track. At each amber light review, the Sponsoring Agency should provide the Sanctioning Authority with verification that the project continues to be achievable within the budget, programme and scope constraints previously approved.

The Sanctioning Authority retains the right to request additional information from the Sponsoring Agency at any project review. In this regard, Sanctioning Authorities should give particular consideration to the submission prior to the application for statutory planning approvals. This is an important stage because once a project passes into the statutory planning process it becomes more difficult to make changes to the scheme and details of the project are made public.

The Sanctioning Authority's assessment can include an examination of the Design Team's report and the Sponsoring Agency's review of that report. The assessment should focus on the key requirements in terms of quality (including function), programme and cost.

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## 1.5 Cost Control in Design Development – Roles and Responsibilities, Continued

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### Sanctioning Authority: roles and responsibilities (continued)

#### ***Due diligence on large projects***

For large projects (greater than €30m) a more formal due diligence assessment should be carried out, which should include the following:

- Cost–Benefit analysis;
- Assessment of the achievement of the Definitive Project Brief objectives (and design standards in the case of civil engineering projects);
- Assessment of the completeness of the tender documentation; and
- Assessment of the project’s risk profile.

#### ***Risk Assessment: the role of the Sanctioning Authority***

The Sanctioning Authority should periodically assess the Sponsoring Agency’s risk management approach and the sufficiency of any mitigation measures it has adopted. The Sanctioning Authority should also periodically assess the adequacy of the ongoing contingency.

Arising from such assessment by the Sanctioning Authority, there may be a requirement to put in place change control systems and other procedures. When this occurs, it must be recorded using an agreed documentation and recording procedure.

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### Sponsoring Agency: roles and responsibilities

The Sponsoring Agency is the key Client body with responsibility for initiating and monitoring the delivery of a capital project. In fulfilling this function the Sponsoring Agency, and in particular the Project Coordinator (the person charged with the day-to-day monitoring and approvals) must have appropriate systems and procedures in place to monitor and approve designs and costs. See the Budget Template in Appendices A and B of the guidance note *Budget Development* (GN1.3) for a non-exhaustive list of the costs to be monitored.

It is also the Sponsoring Agency’s responsibility to seek the approval of the Sanctioning Authority for any material change or change in circumstance which impact on the project for which Approval in Principle was granted.

#### ***Communications***

In relation to communications it is important to note the provisions in clause 7, [7] to [10] of the *Standard Conditions of Engagement for Consultancy Services (Technical)* (COE 1) which states:

*‘The Client may respond to Consultant’s communications with comments, questions, objections, to which the Consultant shall reply. A Client’s response or failure to respond to any communication from the Consultant does not constitute or imply any review or verification by the Client, or relieve the Consultant from any responsibility or liability.’*

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## 1.5 Cost Control in Design Development – Roles and Responsibilities, Continued

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**Sponsoring Agency: roles and responsibilities (continued)**

### **Progressing a project**

The way the project progresses will depend on when the Client gives permission for a stage to start. Clause 4 [1] of the *Standard Conditions of Engagement for Consultancy Services (Technical)* (COE 1) states:

*‘The Consultant shall start its Services for each Stage when the Client gives permission, perform them regularly, meet each milestone within the Stage, and complete the Services for the Stage with the Performance Period scheduled for it. The timing of each permission to start is the Client’s choice [but clause 5 gives the Consultant rights in respect of the Scheduled Total Performance Period].’*

### **Systems and procedures**

The Sponsoring Agency in fulfilling its responsibility during the design process should have systems and procedures that include the following steps:

Steps	Systems and procedures
<b>1 Cost Planning and Cost Control</b>	<p>This step follows confirmation by the Design Team that the key deliverables of Quality (including function), Programme and Cost are realistic and capable of delivery.</p> <p>The Sponsoring Agency should have decided the extent of cost planning and cost control it requires on a project before it appoints the Design Team. It is critical that the Cost Plans and Cost Check reports are reviewed at the appropriate time to confirm that the project is within budget.</p> <p>The Cost Plans and Cost Checks should state that they are based on the drawings and information issued by the Design Team and that the notes and exclusions are not lengthy, exclude too much or are unacceptably onerous for a Sponsoring Agency to accept.</p>
<b>2 Programme confirmation</b>	<p>The Sponsoring Agency should regularly review project progress against the project master programme and identify any time lost or gained since the previous stage.</p> <p>In reviewing the programme the Design Team should offer practical suggestions as to how lost time might be made up in order to bring the project back on track. The Sponsoring Agency should include in their formal approval any programme adjustments necessary (accelerations / overlapping of tasks and so on) to maintain the master programme end date.</p>

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## 1.5 Cost Control in Design Development – Roles and Responsibilities, Continued

### Sponsoring Agency: roles and responsibilities (continued)

Steps	Systems and Procedures
<b>3 Update and review of Risk Register</b>	<p>As projects progress through the stages the Sponsoring Agency should maintain a master Risk Register, which should be updated to reflect changes to risk as a result of:</p> <ul style="list-style-type: none"> <li>▪ Risks that have been eliminated;</li> <li>▪ Mitigation measures taken;</li> <li>▪ Investigations to determine the extent of risks; and</li> <li>▪ The emergence of new risks etc.</li> </ul> <p>Management of risk is designed to reduce the exposure as the project progresses through the design process. Appendix B of <i>Project Management</i> (GN 1.1) includes a sample Risk Register.</p>
<b>4 Contingency management</b>	<p>Linked to the Risk Register is the practice of contingency management, or management of the project contingency fund. The project contingency fund that the Sponsoring Agency retains and manages should reflect the level of risk exposure expected.</p> <p>See <i>Budget Development</i> (GN 1.3), chapter 2.2 for details of the contingency permissible at different stages of a project.</p>
<b>5 Review of ‘Other Costs’</b>	<p>In addition to the construction cost reported by the Design Team, the budget contains provision for a series of ‘Other Costs’, which are managed directly by the Sponsoring Agency.</p> <p>The Project Coordinator should update the ‘Other Costs’ whenever new factual information is made available, particularly from the previous stage where items may have been further refined or confirmed. For example where external consultants are appointed to the Design Team, the Fees section should be updated to reflect the agreed fees from the consultant appointment process.</p> <p>‘Other Costs’ also need contingency management in the context of the contingency fund (which includes any project contingency that has been set aside).</p>

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## 1.5 Cost Control in Design Development – Roles and Responsibilities, Continued

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### Sponsoring Agency: roles and responsibilities (continued)

Steps	Systems and Procedures
<b>6 Corrective action and change control procedures</b>	<p>Following a review of the design and ‘Other Costs’ during design development, the Sponsoring Agency may need to implement corrective actions. In exceptional circumstances, it may also seek to change the Definitive Project Brief. It is essential that the Sponsoring Agency has procedures in place for corrective action and change control. Where such procedures become necessary they must be recorded using an agreed documentation and recording procedure.</p> <p>See Chapter 4 below for details of change management and corrective action procedures.</p>

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### Design Team: roles and responsibilities

The Design Team members have an individual and collective responsibility to assist in the delivery of the project on budget. The lead member of the Design Team assists the other members to coordinate their services where they are related in content and timing. If necessary the Design Team Leader / Lead Consultant resolves conflicts in coordination. See the *Standard Conditions of Engagement for Consultancy Services (Technical)* (COE 1).

#### **The Cost Adviser**

The Cost Adviser takes responsibility for managing the project capital costs during the design development process. This usually involves the following:

- Preparing estimates and quantifying risks;
  - Cost planning, cost management and reporting, and working with other Design Team members in the production of tender documents; and
  - Whole life costing.
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## 1.5 Cost Control in Design Development – Roles and Responsibilities, Continued

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### Responsibility for managing change

Change request forms should be used as an integral part of the change management process. The requests for change by individual Design Team members or by the Design Team as a whole should be made to the appropriate decision making point as defined in the project structure. The issues of threshold limits should also be built into the request form and this should determine the route for decision making to either the Sponsoring Agency or Sanctioning Authority as appropriate.

The Sponsoring Agency should verify that the procedures for change control have been followed by the Project Coordinator and/or Design Team. Change request forms should be reviewed as an audit function of the change management process.

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### Responsibility for contingency management

Contingency management can deal with changing project circumstances (such as changes within the approved scope of the works) through a variety of processes, including:

- Corrective action;
- Value management;
- Additional capital provision from a contingency fund, or from the Sanctioning Authority; and from
- Flexibility in the delivery – for example, through phased delivery.

The risk management strategy should be used to identify the most appropriate method of dealing with risk and where appropriate addressing that strategy through the use of the contingency fund. The option of increasing the capital expenditure outside the contingency fund for the project should only be considered if all the other options are unworkable and the facility continues to be a priority. Such consideration will require the Sanctioning Authority's approval before it is undertaken.

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## 2: Cost Control in Design Development

### 2.1 Overview

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#### Design Development Process

This document sets out the key actions that need to be taken to control capital costs during the design development process.

Read this document in conjunction with the guidance note *Design Process* (GN 2.1) which focuses on the stages and procedures in the design development process.

The CWMF provides standard templates for different cost planning and control functions. The use of templates at different stages in the delivery lifecycle of a project is detailed in an appendix to this guidance note.

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#### Project Review

Under a traditional project the Design Team is responsible for the planning, preparation, development and delivery of the complete design and tender documentation through at most four phases each with a project review.

Information provided at these project reviews, plus ongoing liaison enables the Sponsoring Agency and in particular the Project Coordinator to monitor and approve the project delivery and where necessary implement the appropriate actions to ensure the project budget is maintained.

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#### Contents

This chapter covers five design phases as follows:

Topic	See Page
<b>2.2 Cost Control in Design Development – Roles and Responsibilities</b> Summarises roles and responsibilities in relation to cost control during the design process.	35
<b>2.3 The Outline Cost Plan and Related Activities</b> Describes the Outline Cost Plan and other cost planning and control activities in relation to Project Reviews 2 and 3.	36
<b>2.4 Developed Cost Plan / Outline Cost Plan (revised) and Related Activities</b> Describes the Developed Cost Plan / Outline Cost Plan (revised) and other cost planning and control activities in relation to Project Review 4.	27
<b>2.5 Review of Developed Cost Plan / Outline Cost Plan (revised)</b> Describes the review of the Developed Cost Plan / Outline Cost Plan (revised) in advance of Project Review 5.	42
<b>2.6 Detailed Cost Check and Pre-Tender Cost Check</b> Describes the Detailed Cost Check and Pre-Tender Cost Check taking place in advance of tender documents issue.	46

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## 2.2 Cost Control in Design Development – Roles and Responsibilities

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**Cost control in design process: summary** The following table summarises roles and responsibilities in relation to cost control during the design process:

<b>Sanctioning Authority</b>	It is the Sanctioning Authority's role to determine the outcome of any issue which impacts on a project arising out of a change in any of the components or circumstances on which the Approval in Principle was based.
<b>Sponsoring Agency</b>	It is the Sponsoring Agency's role to monitor and approve designs and costs. It is also its responsibility to seek the approval of the Sanctioning Authority for any material change or change in circumstance which impact on the project for which Approval in Principle was granted.
<b>Project Coordinator</b>	It is the Project Coordinator's role to monitor and approve costs in the design process. This includes the capital costs and all other costs properly accruing to the project. These costs are typically those indicated (not an exhaustive list) in the Budget Template in Appendices A and B of <i>Budget Development</i> (GN1.3).
<b>Cost Adviser</b>	The Cost Adviser's role is to manage the project capital costs during the design development process.
<b>Design Team</b>	The Design Team members have an individual and collective responsibility to assist in the delivery of the project on budget. The Design Team Leader / Lead Consultant assists the other members to coordinate their services where they are related in contents and timing. If necessary the Design Team Leader / Lead Consultant resolves conflicts in coordination. See Clause 7.12 of the <i>Standard Conditions of Engagement for Consultancy Services (Technical)</i> (COE 1).

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## 2.3 The Outline Cost Plan and Related Activities

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### Project Review 2

The first Budget Check takes place just after the Cost Adviser and other Design Team members are appointed. Its purpose is to test the feasibility of the preferred project option selected at the Appraisal stage.

Where the results of the check are positive, and the budget is confirmed as being adequate, the Sponsoring Agency certifies this to the Sanctioning Authority as part of the output from Project Review 2.

After a period of time (agreed beforehand with the Sponsoring Authority), the Sponsoring Agency instructs the Design Team Leader / Lead Consultant in writing to proceed to the next stage – provided the Sanctioning Authority has no queries and does not issue an instruction to put the project on hold. **This is a necessary step before the commencement of the Planning Developed stage.**

See *Design Development Process* (GN 2.1) for more information on the project reviews and their impact on design.

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### Design-and-build: transferring risk to the Contractor after a Project Review

For design-and-build projects, the Sponsoring Agency may decide to cease design work at the conclusion of any one of the project reviews (up to and including Project Review 6, but preferably earlier), and to transfer complete design and statutory approval risk from that point on to the successful design-and-build Contractor who emerges from the tender process.

**In this case, all formal cost planning and cost control procedures relating to design are no longer relevant as the design risk is transferred to the Contractor who tenders for the project on the basis of market conditions**

For design-and-build projects, the Sponsoring Agency will require the Design Team it has appointed to remain in place to:

- Prepare tender documents (based on the Sponsoring Agency's output requirements, and pricing templates) for design-and-build tenderers;
- Evaluate tender designs and prices; and
- Monitor construction, administer the contract and settle the final account.

The Sponsoring Agency will also be required to appoint a Project Supervisor for the Design Process (PSDP) to address Health and Safety design issues in the tender documents.

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## 2.3 The Outline Cost Plan and Related Activities, Continued

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### Cost control activities in advance of Project Review 3

The Outline Cost Plan is developed in parallel with the Outline Sketch Scheme (building) / Preliminary Planning (civil engineering), in preparation for Project Review 3. This is the first cost control activity in the Planning Developed stage. The following activities are carried out in the preparation of the Outline Cost Plan:

- Assessment of design options, including cost assessment; and
- Examination of a range of cost measures.

Each of these activities and the development of the Cost Plan itself are described in turn.

**Note:** In the case of civil engineering projects, the Sponsoring Agency may (with the agreement of the Sanctioning Authority) authorise the combination of Project Reviews 3 and 4 into a single review.

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### Assessment of design options

The preferred strategic option selected at Appraisal stage should be reassessed during the Feasibility Study (building) or Preliminary Report (civil engineering) in advance of the preparation of the Definitive Project Brief. A further reassessment should be undertaken by the Design Team on its appointment, and it should seek to verify the continuing validity of the chosen option.

At this stage, the Design Team should also determine if the preferred option needs to be developed further. It does this by exploring various design choices within the framework of the strategic option.

#### **Example of option assessment**

An example of the strategic option is to provide public services from a location where there is an existing city centre public building and there is a decision to retain that building. Design studies within the strategic option could address questions such as:

- Should it be refurbished?
- Should it be refurbished with an extra floor added to provide the necessary accommodation? or
- Should it be refurbished and the building be extended?

A decision to demolish the entire building and build a new facility is a strategic decision and should have been considered and ruled out when the strategic option to retain the building was taken.

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## 2.3 The Outline Cost Plan and Related Activities, Continued

**Assessment of design options (continued)**

**Aim of option assessment**

The aim of the design option study is to compare the various solutions to see which option best meets the Client’s budget and Definitive Project Brief. This facilitates the selection of the most appropriate design option. It should not be the intention to develop detail costing based on actual measurement at this stage but rather to identify cost holding categories with realistic target costs (in place holders) so that the order of costs can be compared with the alternatives in the context of the approved budget.

**Cost Assessment**

The cost assessment of the preferred design option should include the following:

Exercise	Assessment
1 Benchmark Costs	In the assessment of the design options, benchmark costs should be utilised for the various cost holding categories based on costs per unit of measure (m <sup>2</sup> , %, kilometre, and so on) to develop the Outline Cost Plans for the options being considered. In addition costs should be benchmarked against functional unit costs as a cross-checking mechanism.
2 Assessment of site-specific and abnormal costs	In addition to the benchmark functional unit costs discussed above, orders of costs need to be established for site-specific and abnormal costs for each of the options being considered. These costs need to be separately identified (for example, lump sum allowance based on historic information) and any assumptions relating to these must be stated explicitly.

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## 2.3 The Outline Cost Plan and Related Activities, Continued

**Cost Measures** The following cost measures should be considered separately during the preparation of the Outline Cost Plan.

Cost Measure	Assessment
<b>Key ratio analysis</b>	<p>As the design is developed, key ratio analyses should be examined to help identify cost-efficient solutions. It is crucial to do this early in the design process, as decisions taken early have the greatest impact on cost. Attempts to rectify incorrect or poor decisions later in the process can be very difficult, if not impossible.</p> <p>An example of a key ratio analysis in the building context would involve obtaining the <i>net to gross floor area ratio</i> in order to assess the proportion of circulation required, which could then be compared to sector norms.</p> <p>An engineering example might involve looking at the <i>cut and fill ratio</i> required and thus determine the cost effectiveness of a particular solution.</p> <p>Key ratio analysis will have to be balanced with other factors such as quality and functionality in determining the final solution.</p>
<b>Site arrangement cost assessment</b>	<p>A cost assessment should be carried out on the facilities' footprint on the site. Careful consideration should be given to any abnormal factors (uneven topography, crossing services, tidal influences, rivers, wells, and so on); and plans should be outlined as to how these issues might be addressed.</p>
<b>Risk management</b>	<p>It is important to see the management of risk as a key tool in the planning and control of costs. Information and action are essential in any formal risk management strategy, and this should ensure that procedures are put in place to supply the Design Team members with relevant information so that they can take appropriate action to identify, assess, eliminate, and mitigate risks.</p> <p>See chapter 6 of <i>Project Management</i> (GN 1.1) for more information on risk management.</p>
<b>Value management</b>	<p>Value for money is the optimum balance between the benefits gained from a facility and the investment made to acquire it. Value management is a set of structured activities that are carried out throughout the project delivery life cycle aimed at maximising value for money.</p> <p>See chapter 7 of <i>Project Management</i> (GN 1.1) for more information on value management.</p>

*Continued on next page*

## 2.3 The Outline Cost Plan and Related Activities, Continued

### Cost Measures (continued)

Cost Measure	Assessment
<b>Whole life cost appraisal</b>	<p>Whole life costs are an important consideration during the design process. The Design Team should strive to design a solution that is affordable, cost-effective and that achieves value for money, both in capital and whole life cost terms. In this regard the Cost Adviser should identify the key whole life cost issues that require strategic decision-making early in the design process. A balance should be struck between what is desirable and what is affordable.</p> <p>See Chapter 3 for details of whole life cost appraisal tasks.</p>

### Outline Cost Plan

The Outline Cost Plan is a schedule of high level cost holding categories that are established at the start of the design process and remain constant up to the Analysis Of Outturn Costs stage. However, the values of each cost holding category will be subject to change during the delivery life cycle process of a project, ranging from realistic target costs in the Outline Cost Plan to actual incurred costs at the Analysis of Outturn Costs. In determining target construction costs, issues such as risks, value for money and whole life cost should also to be considered.

In summary the Outline Cost Plan should be based on:

- The Outline Sketch Scheme (design) / Preliminary Planning (design) developed for the most realistic cost effective option in a range of options for a project;
- Benchmark cost data adjusted to establish realistic targets for each cost-holding category;
- Costs associated with the assessment of site / ground conditions – using updated historical cost data where appropriate; and

In addition, it should not have a separate sum included for design contingencies, and it should be VAT-inclusive.

It is acknowledged that every project is different and cost advisers should use their professional judgement to decide if additional levels of investigation and reporting requirements are needed for a particular project – including additional investigation into market behavior and prices.



## 2.3 The Outline Cost Plan and Related Activities, Continued

### Review 3 Checklist

The following table is a checklist of cost control activities and outcomes that take place at Project Review 3.

		Check
	Activities	
<b>Option assessment</b>	1. Benchmarking of the cost holding categories	<input type="checkbox"/>
	2. Assessment of site-specific and abnormal costs	<input type="checkbox"/>
<b>Cost measures</b>	3. Key ratio analysis	<input type="checkbox"/>
	4. Site arrangement cost assessment	<input type="checkbox"/>
	5. Risk management	<input type="checkbox"/>
	6. Value management	<input type="checkbox"/>
	7. Whole life cost appraisal	<input type="checkbox"/>
<b>Outline Cost Plan</b>	Completed	<input type="checkbox"/>
<b>Submit certification</b>	Certified to the Sanctioning Authority that a design has been selected based on the approved outputs and within the approved budget.	<input type="checkbox"/>
<b>Submit referral</b>	Referred to the Sanctioning Authority: design costs in excess of the budget, or questions relating to the need for the facility, or funding difficulties.	<input type="checkbox"/>
	Outcomes	
<b>Successful outcome</b>	Proceed to next phase provided no outstanding queries or hold requests from the Sanctioning Authority after the time period (agreed beforehand with the Sanctioning Authority) has expired.	<input type="checkbox"/>
<b>Project on hold</b>	The project is on hold due to query or request from Sanctioning Authority.	<input type="checkbox"/>
<b>Project cancelled</b>	The project is cancelled by the Sanctioning Authority.	<input type="checkbox"/>

## 2.4 Developed Cost Plan / Outline Cost Plan (revised) and Related Activities

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### Cost control activities at Project Review 4

At Project Review 4, cost control consists of the management and containment of the overall approved capital budget and the realistic costs identified for the cost-holding categories in the Outline Cost Plan.

The outputs from the cost control activities in advance of Project Review 4 are:

- For building projects: the **Developed Cost Plan**; or
- For civil engineering projects: the **Outline Cost Plan (revised)**

### **Cost control and statutory planning**

This stage also involves preparation of the submission for statutory planning approval, and the Developed Cost Plan / Outline Cost Plan (revised), together with the Whole Life Cost Appraisal, are key documents in this regard.

The cost control function at this stage in the project is very important in terms of determining the project outturn cost. This is because it verifies the cost prior to application for statutory approval. Once planning permission / statutory approval is granted this represents a major constraint in making any further significant design/scope changes to the project. For example, in the case of a building this would constrain changes to the footprint, shape, height and appearance.

See *Design Development Process* (GN 2.1) for a more detailed description of what is required at this stage in the design process (Developed Sketch Scheme / Preliminary Planning).

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### Design-and-build: transferring risk to the Contractor after a Project Review

For design-and-build projects, the Sponsoring Agency may decide to cease design work at the conclusion of any one of the project reviews (up to and including Project Review 6, but preferably earlier), and to transfer complete design and statutory approval risk from that point on to the successful design-and-build Contractor who will emerge from the tender process.

**In this case, all cost planning and control procedures relating to design ceases once the design and statutory approval risk are transferred to the Contractor.**

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## 2.4 Developed Cost Plan / Outline Cost Plan (revised) and Related Activities, Continued

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**Developed Cost Plan / Outline Cost Plan (revised)**

The Developed Cost Plan / Outline Cost Plan (revised) is the key cost control document developed at this stage of the design process. The high level cost holding categories listed in the Outline Cost Plan are developed and adjusted in line with design developments and set out in greater detail in the Developed Cost Plan / Outline Cost Plan (revised).

The only exceptions where approved increases may be permitted (on the costs contained in the Outline Cost Plan) are in relation to:

- Construction inflation;
- Appropriate design improvements linked to life cycle costs which were initially proposed but not approved and are now considered acceptable; and
- Quantification of risks where allowances are justifiably insufficient and after credits elsewhere on the project have been taken into account.

The costs of any of these items once approved are funded from a design and inflation contingency which a client should make provision for in the budget that forms part of the Definitive Project Brief.

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**Cost Measures**

The following cost measures should be considered separately during the preparation of the Developed Cost Plan / Outline Cost Plan (revised).

Cost Measure	Assessment
<b>Key ratio analysis</b>	The review of key ratio analysis against benchmark data can greatly assist in understanding the distribution of costs and the efficiency of the project. These should have been established already at the Outline Cost Plan.
<b>Cost holding category balance appraisal</b>	<p>The apportionment of costs to the cost-holding category should have been done at Outline Cost Plan stage. These costs should have been distributed in a balanced way that reflects sector norms. The valuation of the design using measurement and prices should identify any movement in cost and significant imbalances that the particular design throws up.</p> <p>There may be project-specific factors which account for the divergence from the sector norms. This appraisal can assist the Design Team review its Developed Sketch Scheme / Preliminary Planning and the Sponsoring Agency can consider the value for money offered by a particular solution.</p>

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*Continued on next page*

## 2.4 Developed Cost Plan / Outline Cost Plan (revised) and Related Activities, Continued

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### Cost Measures (continued)

Cost Measure	Assessment
<b>Risk management</b>	<p>It is essential that the risk management process identifies, investigates, eliminates and mitigates risk, and makes financial provision in the form of an appropriate contingency.</p> <p>See chapter 6 of <i>Project Management</i> (GN 1.1) for more information on risk management.</p>
<b>Value management</b>	<p>It is important that value management remains an active process during design development.</p> <p>See chapter 7 of <i>Project Management</i> (GN 1.1) for more information on value management.</p>
<b>Whole life cost appraisal</b>	<p>In addition to the capital expenditure set aside for each cost holding category for project construction, it is important to review these categories in relation to whole life costs. To the extent to which the Sponsoring Agency's budget (including the contingency fund) permits and with the approval of the Sponsoring Agency, the design should be upgraded in order to achieve long-term savings.</p> <p>Depending on the project type investment in whole life costs can be significant and must be balanced over different options in terms of project affordability.</p> <p>See chapter 3 below for more information on whole life cost appraisal.</p>
<b>Cashflow Forecast</b>	<p>In order to help the Sponsoring Agency review the overall project budget in tandem with the master schedule, the Developed Cost Plan / Outline Cost Plan (revised) should contain a draft Cashflow Forecast.</p>

*Continued on next page*

## 2.4 Developed Cost Plan / Outline Cost Plan (revised) and Related Activities, Continued

### Review 4 checklist

The following table is a checklist of cost control activities and outcomes that take place at Project Review 4.

		Check
	Activities	
<b>Cost Measures (all projects)</b>	1. Key Ratio Analysis	<input type="checkbox"/>
	2. Cost Holding Category Balance Appraisal	<input type="checkbox"/>
	3. Risk Management	<input type="checkbox"/>
	4. Value Management	<input type="checkbox"/>
	5. Whole Life Cost Appraisal	<input type="checkbox"/>
	6. Cash Flow Forecast	<input type="checkbox"/>
<b>Developed Cost Plan</b>	Completed	<input type="checkbox"/>
<b>Outline Cost Plan (revised)</b>	Completed	<input type="checkbox"/>
<b>Submit Certification</b>	Certified to the Sanctioning Authority that the Developed Sketch Scheme / Preliminary Planning is complete and is within the approved budget.	<input type="checkbox"/>
<b>Submit Referral</b>	Referred to the Sanctioning Authority design costs in excess of the approved budget, a question over the need for the facility, or a funding difficulty.	<input type="checkbox"/>
	Outcomes	
<b>Successful Outcome</b>	Proceed to next stage provided there are no outstanding queries or hold requests from the Sanctioning Authority after the a time period (agreed beforehand with the Sanctioning Authority) has expired.	<input type="checkbox"/>
<b>Project on hold</b>	The project is on hold due to query or request from Sanctioning Authority.	<input type="checkbox"/>
<b>Project cancelled</b>	The project is cancelled by the Sanctioning Authority.	<input type="checkbox"/>

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## 2.5 Review of Developed Cost Plan / Outline Cost Plan (revised)

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### Cost control activities at Project Review 5

At Project Review 5, cost control consists of the management of the impact on the project budget of the costs associated with statutory approvals.

The costs associated with any conditions attached to a statutory approval (including any conditions in relation to fire safety imposed by the Fire Officer which have cost implications) should be quantified and valued as part of the cost check at this stage.

Risk of such costs should have been identified through informal discussions with the statutory authority and considered when the Outline Cost Plan was being developed and an allowance included in the approved budget. If such an allowance proves to be insufficient at quantification stage, the extra cost should be balanced against the costs of other risks not yet quantified (and for which surpluses are expected) to see if it can be offset by credits elsewhere so that the approved budget is not exceeded. The allowances should initially be based on updated historical cost data for similar projects adjusted as appropriately.

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### Project Review 5

If the approved budget in the Developed Cost Plan / Outline Cost Plan (revised) does not require an increase following consideration of the statutory approval conditions (if any) the Sponsoring Agency should certify to the Sanctioning Authority that statutory approval has been obtained and the project remains within budget. The opportunity for adjustment within the cost holding categories (where additional information comes to light after Project Review 4) to contain the cost of the project within the approved budget is permissible at this stage.

If the need for the facility continues to exist and there is funding, the Sponsoring Agency may proceed to the next stage of the design process after an a waiting period (agreed beforehand with the Sanctioning Authority), unless instructed otherwise.

If, however, the cost of the statutory approval conditions cannot be contained within the approved budget or if there is a question over the need for the facility, or there is a funding problem, the project should be referred back to the Sanctioning Authority for a decision.

See *Design Development Process* (GN 2.1) for more information.

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## 2.5 Review of Developed Cost Plan / Outline Cost Plan (revised), Continued

### Review 5 Checklist

The following table is a checklist of cost control activities and outcomes that take place following statutory approval at Project Review 5.

		Check
	Activities	
<b>Statutory Conditions Review</b>	Statutory condition 1	<input type="checkbox"/>
	Statutory condition 2	<input type="checkbox"/>
	Statutory condition 3 etc...	<input type="checkbox"/>
<b>Developed Cost Plan / Outline Cost Plan (revised)</b>	Cost check of statutory conditions against allowances provided for including allowances for Fire Officer requirements,	<input type="checkbox"/>
<b>Submit certification</b>	Certified to the Sanctioning Authority that statutory approval has been obtained and is within the approved budget.	<input type="checkbox"/>
<b>Submit referral</b>	Referred to the Sanctioning Authority design costs in excess of the budget, a question over the need for the facility, or a funding difficulty.	<input type="checkbox"/>
	Outcomes	
<b>Successful outcome</b>	Proceed to next stage provided there are no outstanding queries or hold requests from the Sanctioning Authority after the time period (agreed beforehand with the Sanctioning Authority) has expired.	<input type="checkbox"/>
<b>Project on hold</b>	The project is on hold due to query or request from Sanctioning Authority.	<input type="checkbox"/>
<b>Project cancelled</b>	The project is cancelled by the Sanctioning Authority.	<input type="checkbox"/>

## 2.6 Detailed Cost Check and Pre-Tender Cost Check

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### Cost control activities in advance of Project Review 6

At Project Review 6, cost control involves ensuring that the Detailed Design / Detailed Planning (Design) can be delivered within the budget set for the project. This is the last cost check that is conducted in advance of the issuing of the tender documents.

- **The Detailed Cost Check** should be based on measurements taken from the working drawings, detailed specifications, rebar schedules and other relevant tender documentation and priced at current prices. This check involves pricing the Pricing document referenced in section 1B of the Schedule to the main contract (PW-CF1 – PW-CF5) and updating the Developed Cost Plan [revised] / Outline Cost Plan [revised]).
- **The Pre-Tender Cost Check** is an additional check that takes place if a significant period of time elapses between the Detailed Cost Check and the issue of tender documents to the market. This is essential to ensure that the pricing information is up to date when tenders are being sought. The prices in the Cost Check should not be more than one month old prior to tenders being sought. If the Pre-Tender Cost Check does not reveal differences in pricing, the Sponsoring Agency should inform the Sanctioning Authority and seek formal permission to issue the tender documents.

The structure of the Detailed Cost Check should be on the basis of the schedule of the cost holding categories for the project established at the start of the design process. Even at this stage, there is still some very limited opportunity for making adjustments in the cost holding categories to contain the cost of the project within budget

If the project meets the requirements set in the Definitive Project Brief and the Pre-Tender Cost Check confirms that it is within the approved budget, the Sanctioning Authority should be formally notified of compliance by the Sponsoring Agency.

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### Detailed Design Review

During the progression of the detailed design in the Detailed Design / Detailed Planning (Design) stage the emphasis in cost terms changes from primarily cost planning at the earlier design stages to cost control during the developed sketch design and the detail design stage.

To optimise the level of cost control during this period the Cost Adviser should regularly carry out cost checks on the cost holding categories that go to make up the approved budget. This is to verify that the design and elements of the design are in line with the costs included at the Developed Cost Plan / Outline Cost Plan (revised) stage.

#### **Change Control**

If changes arise at Detailed Design / Detailed Planning, it is important that change management controls are in place to ensure the Design Team seeks appropriate approvals, particularly where a budget adjustment is required. Changes in project scope should not be permitted at this late stage in the design process.

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## 2.6 Detailed Cost Check and Pre-Tender Cost Check, Continued

### Detailed Design Review: cost checking

The cost checking of the cost holding categories at this stage will have the benefit of additional design and project information that may not have been available up to this point to be firmly valued; this information is summarised in the following table:

Information Type	Description
<b>Specialist works</b>	<p>Any outstanding detailed design for specialist works should be developed during this stage, including any design work associated with the main contractor's requirements.</p> <p>The Cost Adviser should review and verify that the detailed design is within the sum allocated for that work in the Developed Cost Plan / Outline Cost Plan (revised) adjusted for any statutory approval conditions.</p>
<b>Design coordination</b>	<p>Design coordination under the supervision of the Design Team Leader / Lead Consultant is critical at this stage to ensure that clashes do not occur on site with potentially expensive remedial works – see Clause 7, Cooperation, of the <i>Standard Conditions of Engagement for Consultancy Services (Technical)</i>. This is particularly important with regard to the routing of services.</p>
<b>Risk management</b>	<p>A Risk Management workshop should be conducted by the Design Team Leader / Lead Consultant near the end of the Detail Design / Detailed Planning stage in order to identify outstanding risks, contract strategy (i.e. optimal risk transfer) and any associated mitigation measures needed. Refer to guidance note <i>Project Management</i> (GN 1.1) on Risk Management.</p>
<b>Programme management</b>	<p>The design production programme should be controlled throughout the Detail Design / Detailed Planning (Design) stage in order to ensure the project goals can be achieved as the design evolves. The programme for the design process is established when the Design Team is appointed. See the time periods specified in Schedule B of the <i>Standard Conditions of Engagement for Consultancy Services (Technical)</i>. A final review of the production programme should confirm the status of the project.</p>

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## 2.6 Detailed Cost Check and Pre-Tender Cost Check, Continued

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### Independent scrutiny at Review 6

Construction consultants or in-house design teams' estimates for project designs should be subject to independent scrutiny to determine if:

- (i) The estimates are within accuracy margins acceptable to contracting authorities (e.g. as set out in Schedule under Clause 12 of the Conditions of Engagement for Consultancy Services [Technical] ), and
- (ii) that the projects represent value for money.

The independent scrutiny should also examine the design information for completeness and if gaps are discovered they should be filled in before tenders are sought.

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### Tender Documentation

It is a prerequisite of good cost control that complete and accurate tender documentation is prepared. This is essential in terms of minimising the risk of changes being made at the Implementation stage. The key elements in ensuring that tender documentation is complete are;

- Design completeness;
- Design coordination;
- Contract and site arrangement; and
- The Pricing Document (e.g. Bill of Quantities).

The Bill of Quantities should comprehensively quantify the works in accordance with the Agreed Rules of Measurement (or the Civil Engineering Standard Method of Measurement or the Method of Measurement for Highway Works as appropriate) provided that their use is made consistent with the Department of Finance approved amendments.

#### **Designers of specialist works**

On traditional, Employer-designed projects, the full design should be prepared for the project (including all specialist works) and included with the tender documents – this is necessary to enable tenderers to competitively tender a fixed-price, lump sum for the project in the context of the new public works contracts. It should be noted that the new public works contracts do not allow for Prime Cost Sums and Provisional Sums.

Designers of specialist works (e.g. mechanical and electrical services) must work in coordination with the designers of the main works in accordance with Clause 7.14 of the *Standard Conditions of Engagement for Consultancy Services (Technical)* which states

*' ... [the Consultant] ... shall comply with coordination decisions of any leader of the team appointed by the Client.'*

This is to avoid costly deficiencies, inconsistencies or clashes during Implementation; and not to so comply would be a breach of contract.

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## 2.6 Detailed Cost Check and Pre-Tender Cost Check, Continued

**Project Review Report**

The Sponsoring Agency must receive formal written approval from the Sanctioning Authority prior to proceeding to the Tender stage.

If the Detailed Cost Check or the Pre-Tender Cost Check reveal that the costs are in excess of the budget, or if there is a question over the need for the facility, or if there is a funding problem, the project should be referred back to the Sanctioning Authority for a decision. See the guidance notes *Design Development Process* (GN 2.1).and *Project Management* (GN1.1).

On completion of the tender documentation the Design Team should prepare a Project Review Report to summarise the cost considerations, including:

Pre-Tender Review	Description
<b>Detailed Cost Check and Pre-Tender Cost Check</b>	<p>On completion of the tender documentation, the Cost Adviser should prepare a Detailed Cost Check using all relevant tender documents including the Pricing Document. This Detailed Cost Check should be based on prices current at the time of preparation and based on the proposed conditions of contract.</p> <p>It should also highlight any approved exclusions from the Detailed Cost Check.</p> <p>If a significant period of time elapses from when the tender documents were prepared, the budget will need to be refreshed. In such circumstances the Pricing Document should be priced at current prices and a short supplementary Project Review Report prepared.</p> <p>This is essential to ensure that the pricing information is up to date when tenders are being sought. The prices in the Cost Check should not be more than one month old prior to tenders being sought.</p> <p>If construction inflation needs to be included in the tender price, a separate figure for construction inflation should be identified in the Detailed Cost Check.</p>
<b>Whole Life Cost Update</b>	<p>The whole life cost analysis developed at the Developed Sketch Scheme / Preliminary Planning (Design) stage should be reviewed to take account of any adjustments during Detailed Design / Detailed Planning (Design) and summarised in this report.</p>

*Continued on next page*

## 2.6 Detailed Cost Check and Pre-Tender Cost Check, Continued

### Project Review Report (continued)

Pre-Tender Review	Description
<b>Risk Register</b>	The Project Review Report should include the up-to-date statement on risk strategy and a project Risk Register. At this stage of the project the risks identified should be managed or mitigated to acceptable levels to allow the project to proceed to tender.  See Chapter 6 of <i>Project Management</i> (GN 1.1) for more information on risk management.
<b>Cash Flow Forecast</b>	A Cashflow Forecast should be included for the construction costs over the implementation stage and the defects liability period.

### Review 6 checklist

The following table is a checklist of cost control activities and outcomes that take place in advance of Project Review 6.

	Activities	Check
<b>Detailed Cost Checks</b>	Detailed Cost Check of all the cost holding categories for the project.	<input type="checkbox"/>
Price Pricing Document and update Developed Cost Plan / Outline Cost Plan (revised)	Pre-Tender Cost Check by pricing the Pricing Document and distributing the overall amount over all the cost holding categories for the project.	<input type="checkbox"/>
<b>Detailed Design / Detailed Planning (Design) Review</b>	Specialist Works	<input type="checkbox"/>
	Design Coordination	<input type="checkbox"/>
	Risk Management	<input type="checkbox"/>
	Programme	<input type="checkbox"/>
<b>Pre-tender Value Engineering exercises</b>	Completed	<input type="checkbox"/>

Continued on next page

## 2.6 Detailed Cost Check and Pre-Tender Cost Check, Continued

### Review 6 Checklist (continued)

		Check
<b>Tender Checklist</b>	Design Completeness	<input type="checkbox"/>
	Contact and Site Arrangements	<input type="checkbox"/>
	Pricing Document (Bill of Quantities)	<input type="checkbox"/>
<b>Tender Documentation</b>	Completed	<input type="checkbox"/>
<b>Submit Certification</b>	Certified to the Sanctioning Authority that the Detailed Design / Detailed Planning (Design) is complete and is within the approved budget.	<input type="checkbox"/>
<b>Submit Referral</b>	Referred to the Sanctioning Authority: design costs in excess of the budget, any question over the need for the facility; any query relating to funding.	<input type="checkbox"/>
	Outcomes	
<b>Successful Outcome</b>	Proceed to the next stage provided there are no outstanding queries or hold requests from the Sanctioning Authority after the time period (agreed beforehand with the Sanctioning Authority) has expired.	<input type="checkbox"/>
<b>Project on hold</b>	The project is on hold due to query or request from Sanctioning Authority.	<input type="checkbox"/>
<b>Project cancelled</b>	The project is cancelled by the Sanctioning Authority.	<input type="checkbox"/>

## 3. Whole Life Cost Appraisal

### 3.1 Integrating Whole Life Cost Management with Cost Plans

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#### Overview

Whole life costs are an important consideration throughout the design process, and should be integrated at each stage in cost plan development:

- In the Outline Cost Plan – at Outline Sketch Scheme / Preliminary Planning
  - In the Developed Cost Plan / Outline Cost Plan (revised) – at Developed Sketch Scheme / Preliminary Planning; and
  - In the Pre-tender Cost Check.
- 

#### Whole Life Costs in the Outline Cost Plan

Whole life costs are an important consideration throughout the design process. The Design Team should strive to design a solution that is cost-effective, affordable and that delivers value for money both in capital and whole life cost terms.

In this regard the Cost Adviser should identify the key whole life cost issues that require strategic decisions early in the design process, and incorporate these into the Outline Cost Plan. In particular, this should involve:

- Adopting good practice in incorporating affordable and sustainable design solutions; and
- Developing a schedule of whole life cost options with indicative order of costs, for review with the Sponsoring Agency.

#### Example

A Design Team is considering the route selection for a new dual carriageway. Three routes are been considered. Whole life costs are prepared to assist in the selection of a route, as follows:

Criteria	Route 1	Route 2	Route 3
Land Acquisition Costs	€	€	€
Initial Capital Costs	€	€	€
Maintenance Costs	€	€	€
Operating Costs	€	€	€
Discount Rate	%	%	%
Whole Life	Yrs	Yrs	Yrs
Net Present Value (NPV)	€	€	€
NPV to Initial Capital Cost	Ratio	Ratio	Ratio
NPV per Km	€/Km	€/Km	€/Km

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## 3.1 Integrating Whole Life Cost Management with Cost Plans, Continued

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### Whole Life Costs in the Developed Cost Plan / Outline Cost Plan (revised)

Whole life costs can include capital, planned maintenance and operational costs over a defined period of time (usually 20-50 years depending on project type and brief) and expressed in terms of Net Present Value (NPV).

Depending on the project type the whole life costs can be significant and will represent a much higher factor in evaluating different options. In the Developed Cost Plan / Outline Cost Plan (revised) the Design Team and the Cost Adviser should:

- Continue to use good practice in incorporating affordable and sustainable design solutions; and
  - Incorporate any measures identified at the previous stage – at this stage further design development of these items should be progressed with estimates of the capital costs and payback periods.
- 

### Whole Life Costs in the Pre-Tender Cost Check

The whole life cost analysis should be reviewed to take account of any adjustments during Detailed Design / Detailed Planning (Design).

#### **Example**

A Design Team is considering the design of median barriers for a dual carriage way. Three options are been considered. Whole life costs are prepared to assist in the selection of a suitable median barrier design, as follows:

Criteria	Design 1	Design 2	Design 3
Capital cost	€	€	€
Routine maintenance costs	€	€	€
Impact repair costs	€	€	€
End of life removal costs	€	€	€
Discount rate	%	%	%
Whole life	Yrs	Yrs	Yrs
Net present value (NPV)	€	€	€
NPV per Km	€/Km	€/Km	€/Km

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## 4. Managing Corrective Action and Change Control

### 4.1 Overview

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#### **Critical Success Factor**

Any attempt to introduce a change in the scope of the project deliverables after the conclusion of the Definitive Project Brief should not be permitted except in very rare, exceptional and justifiable circumstances approved by the Sanctioning Authority. Appropriate procedures to take corrective action or to manage such exceptional change within the scope of the project deliverables forms an integral part of any cost control procedure. Such procedures must not involve any undue delay to the project.

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#### **Contents**

This chapter covers two topics relating to change management and corrective action:

<b>Topic</b>	<b>See Page</b>
<b>4.2 Change Management during the Planning Developed Stage</b> Outlines change management and corrective action procedures during this stage.	57
<b>4.3 Recording Change in the Budget Change Record</b> Explains how to record changes.	58

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## 4.2 Change Management during the Planning Developed Stage

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### Project reviews

Following the reviews of the design (in Project Reviews 1–5) and the review of *other* costs, the Sponsoring Agency may need to implement corrective actions or in exceptional circumstances seek additional funding. It is essential that the Sponsoring Agency has in place appropriate procedures and systems to facilitate corrective action and change control.

Appropriate forms should be developed (and colour coded, if necessary) to effect more efficient communications and record keeping.

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### Report and action

Following a project review the Sponsoring Agency should (subject to the Sanctioning Authority's approval where necessary) after an appropriate period of time (agreed beforehand with the Sanctioning Authority) issue written instructions to the Design Team to start the next stage or to undertake whatever corrective actions are required. This should include clear instructions as to the steps required to progress to the next stage.

Any corrective actions required or approved budget adjustments should be recorded on the Budget Change Record and appended to the Sponsoring Agency's Review Report.

**Note:** See Clause 4(1) and Appendix B of the *Standard Conditions of Engagement for Consultancy Services (Technical)* for details of stages and how they might be broken down on a given project.

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### Exceeds budget report

Where the Outline Cost Plan / Developed Cost Plan / Outline Cost Plan (revised) / Cost Check exceeds the approved budget, the Design Team should submit with their report a detailed explanation and costing of the differences and a recommendation as to potential savings that could bring the project back within budget.

In exceptional circumstances where members of the Design Team believe a budget increase is warranted and / or necessary they can recommend this to the Sponsoring Agency.

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## 4.3 Recording Change in the Budget Change Record

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**Corrective action**

Where a change of some kind is required, but the Sponsoring Agency (at a particular Project Review stage) decides that there are no grounds for a budget adjustment, it can instruct the Design Team to take a *corrective action*. Such an action could include the adoption of savings in some particular that could offset the required change and so leave the budget unaffected.

The offset might also be achieved by improving the specification of certain elements and so reducing the whole life costs. This must be documented as a corrective action in a Budget Change Record.

Budget Change Record	Details	€
<b>Corrective Action</b>		
Budget Transfer		
Contingency Draw down		

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**Budget transfer**

Where the Sponsoring Agency decides that there are grounds for a budget adjustment arising out of projects being below budget or savings found within the project, the Design Team has some flexibility as to the way the transfer of funds within the project will be distributed provided the approved budget does not increase and the transfer represents value for money.

However it should be stressed that strong cost management is required and any transfers should only occur from savings found in areas where costs are firm and distributed to areas to where funds are required. Because target costs are used to establish the Outline Cost Plan and therefore costs are not firm a transfer of funds within a project envisaged above may arise. Any budget transfers should be recorded in a Budget Change Record as a Budget Transfer.

Budget Change Record	Details	€
Corrective Action		
<b>Budget Transfer</b>		
Contingency Draw down		

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### 4.3 Recording Change in the Budget Change Record, Continued

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**Contingency drawdown**

The Sponsoring Agency may also hold a project contingency fund which it manages throughout the design development and implementation process of a project. As identified earlier a drawdown of the contingency should be linked to a risk management assessment. It should also be recorded in the Budget Change Record as a Contingency Drawdown.

Record	Details	€
Corrective Action		
Budget Transfer		
<b>Contingency Draw down</b>		

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## 5. Risk Management Tasks

### 5.1 Risk Management and Cost Control in Design

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**Introduction** It is important to see the management of risk as a key tool in cost control. As outlined earlier, information and action are essential to cost control and the formal management of risk ensures procedures are put in place to supply the relevant Information to allow the Design Team take the appropriate actions in identifying, assessing, eliminating, mitigating and managing risks.

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**Examples** The risks associated with building and civil engineering projects are numerous and can be classified under a number of categories – as in the following table:

Business Case	Project Delivery	Operational
Right Project	Safety	Owner Expectations
Right Location	Quality	Future Expansion
Interest Rates	Cost	Obsolescence
Legislative	Time	Maintenance
Demand / Availability		Availability
Market		Whole Life Costs
		Defects

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# 5.1 Risk Management and Cost Control in Design, Continued

**Risk and Project Reviews**

The Project Review should include the up-to-date statement on the risk strategy and a project Risk Register.

There are various published methodologies and software solutions for risk management. A generic risk management process will usually involve a number of stages, as illustrated in the following scenario:

Risk Stage	Risk Management
<b>Identification</b>	Contaminated soil on site.
<b>Analysis</b>	<p>It is suspected that there may be contaminated soil on the site of a proposed project but the evidence is not conclusive. If this risk were to materialise during construction it would cause significant delay and cost overruns.</p> <p>A number of risk treatment options are considered:</p> <ol style="list-style-type: none"> <li>1. Reduction or elimination of the risk;</li> <li>2. Transfer of the risk via the contract;</li> <li>3. Transfer of the risk by insuring for it;</li> <li>4. Accepting the risk by managing it; and</li> <li>5. Obtaining better information to reduce the risk</li> </ol>
<b>Evaluation</b>	<p>If option 5 is chosen, better information is obtained to determine the full extent of the contaminated material and the nature and toxicity of the contaminant in the soil. This is done by means of investigatory studies.</p> <p>Following detailed evaluation of the investigatory studies the decision to reduce or eliminate the risk would be to remove the contaminated soil.</p>
<b>Risk treatment</b>	Option 5 may be further addressed by conducting a careful examination of the project development, programme, cost and quality issues and deciding to have the contaminated soil removed by means of an enabling works contract and thus reduce the uncertainty and risk to the main project.
<b>Reporting</b>	This particular risk was considered a major risk in terms of the project and was therefore reported on with a frequency and level of detail appropriate to the risk status.
<b>Risk stage</b>	Risk management.

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## 5.1 Risk Management and Cost Control in Design, Continued

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**Risk Register** As projects progress through the design process, the Sponsoring Agency should maintain a master Risk register which should be regularly reviewed and updated to reflect changes to risks as a result of elimination, mitigation measures, investigations to determine their extent, new risks emerging and so on.

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**Risk and contingency management** See the chapter on Maintaining the Project Budget in *Budget Development* (GN 1.3) for information on managing the contingency. This describes how the contingency reduces as the programme progresses and as the risks reduce (or ought to reduce).

If the risk assessment at a given stage requires setting aside a financial provision higher than the allocation allowed for it at that stage of the project, then either the extra funding is provided out the Sponsoring Agency's contingency fund or from credits found elsewhere in the project or both. If the extra cost cannot be covered by either of these sources, the project needs to be referred to the Sanctioning Authority for a decision on extra funding.

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**Project Review 7** *Project Review 7* takes place at the end of the tendering process and its main aim is to review the tender returns before the contract is awarded.

If the tender returns provide the basis for undertaking the planned project the Sanctioning Authority should be formally notified of compliance. The project should not proceed until approval is given by the Sanctioning Authority after which approval should be given by the Sponsoring Agency to the Design Team to proceed to the Implementation stage of the project.

If at this point the tender returns do not justify approval for the next stage of the project, the proposal should be amended or the project should be stopped altogether and referred back to the Sanctioning Authority for a decision. Amendments may involve design changes if the cost of the building is higher than expected or if contractors identify any flaws within the design. If this is the case, consideration will have to be given to abandoning the procurement procedure that was used (in a transparent way) and commencing a new procedure. If the view at this stage is that the project should be abandoned and if substantial amounts have already been spent on planning etc, the situation should be analysed to determine why the project got to this stage and had to be abandoned.

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## 5.1 Risk Management and Cost Control in Design, Continued

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### **Tender return assessment**

The review carried out at Project Review 7 forms the basis of tender analysis. The following activities take place at this project review:

- Checking if the tender returns provide the basis for undertaking the planned project.
- Tender analysis and report – this may involve design queries and clarifications;
- Selection of contractor (for design-and-build projects, the contractors' ability to deliver a suitable design solution should have been assessed at suitability assessment stage of the project); and
- Assessment of risk for tender returns and contractor selection (for design-and-build projects the quality of the built facility needs to be considered).

Although a large part of the tender return assessment relates to the cost of the project (for example, review of outline rates and so on), there may be situations where design solutions need to be considered as well, including design solutions for temporary works on traditional civil engineering projects.

For design-and-build projects an assessment of the detailed design solution proposed by the contractor will be required.

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# Appendix: Standard Templates for Cost Planning and Control

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The CWMF provides standard templates for cost planning and control. There are two standard templates for cost planning and cost control: one suitable for building projects (CO 1a), the other for civil engineering projects (CO 1b). Each form can be used as a template for different cost planning and control functions at different stages in the delivery lifecycle of a project.

All of the principal cost-holding categories are established when the Outline Cost Plan is produced. The values in each category then go through a process of being validated every time a new report is produced as the project progresses through its delivery cycle, up to the completion of Analysis of Outturn Costs report. The following table summarises the main cost report activities and their output documents.

Cost Document	Description
<p><b>Outline Cost Plan</b> (Building and Civil Engineering Works)</p>	<p>The Outline Cost Plan is a schedule of principal cost holding categories that are established at the start of the design process and remain constant up to the Analysis Of Outturn Costs stage.</p> <p>The value of each cost holding category can be subject to change during at the various validation stages in the delivery life cycle process of a project, ranging from realistic target costs in the Outline Cost Plan to actual incurred costs at the Analysis of Outturn Costs. The initial values entered in the Outline Cost Plan should be realistic target costs. In summary the Outline Cost Plan should be based on:</p> <ul style="list-style-type: none"> <li>▪ The Outline Sketch Scheme (design) / Preliminary Planning (design) developed for the most realistic cost effective option in a range of options for a project;</li> <li>▪ Benchmark cost data adjusted to establish realistic targets for each principal cost-holding category;</li> <li>▪ Costs associated with the assessment of site / ground conditions – using updated historical cost data and approximate quantities where appropriate.</li> </ul> <p>The Outline Cost Plan total should in addition include for VAT at the appropriate rates.</p> <p>As every project is different, professional judgement should be exercised as to the levels of investigation and reporting requirements that are needed for a particular project – including appropriate investigation into market behaviour and prices.</p> <p>The Outline Cost Plan is a key cost document that informs Project Review 3.</p>

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## Appendix: Standard Templates for Cost Planning and Control, Continued

Cost Document	Description
<p><b>Developed Cost Plan</b> (Building Works)</p> <p><b>Outline Cost Plan, Revised</b> (Civil Engineering Works)</p>	<p>The Developed Cost Plan / Outline Cost Plan (revised) is the key cost control document developed at the conclusion of the Developed Sketch Scheme / Preliminary Planning stage.</p> <p>The principal cost holding categories in the Outline Cost Plan are disaggregated into sub-cost holding categories as appropriate in the Developed Cost Plan/Outline Cost Plan (revised) and adjusted in line with design changes as the design evolves during Project Reviews 4 and 6 in the planning stage.</p> <p>The Developed Cost Plan/Outline Cost Plan, Revised is a key cost document that informs Project Review 4. It is at this review stage that clearance from the Sanctioning Authority is required before the project can proceed.</p> <p>These cost plans may be subject to amendment as the project passes through Project Reviews 5 and 6.</p>
<p><b>Tender Cost Analysis</b> (Building and Civil Engineering Works)</p>	<p>The Tender Cost Analysis takes place at tender evaluation stage based on the preferred tenderer's price. Its purpose, during the tender evaluation stage, is to enable the comparison of the detailed tender costs under the relevant principal and sub-cost holding categories with those in the pre-tender budgeted costs as set out in the most recently developed/revised cost plan.</p> <ul style="list-style-type: none"> <li>▪ For Employer-designed projects, this will be the Developed Cost Plan (Building Works) or Outline Cost Plan Revised (Civil Engineering Works); and</li> <li>▪ For design-and-build projects, this will be the last cost plan developed in advance of the transfer of design risk to the Contractor – typically, the Outline Cost Plan.</li> </ul>
<p><b>Analysis of Outturn Costs</b> (Building and Civil Engineering Works)</p>	<p>The Analysis of Outturn Costs takes place as part of the Post-project Review when the project has been completed. Its purpose is to compare the actual outturn costs of the project with the budgeted costs as set out in the Tender Cost Analysis. It is structured in the same way as the Tender Cost Analysis with adjusted costs (as a result of compensation events) for the principal and sub-cost holding categories.</p>