

ICMS INTERNATIONAL
CONSTRUCTION
MEASUREMENT
STANDARDS

International Construction Measurement Standards: Global Consistency in Presenting Construction Costs

International Construction Measurement Standards Coalition



International Construction Measurement Standards: Global Consistency in Presenting Construction Costs

International Construction Measurement Standards Coalition

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Welcome to ICMS: Global Consistency in Presenting Construction Costs

The International Construction Measurement Standards (ICMS) aim to provide global consistency in classifying, defining, measuring, analysing and presenting entire construction costs at a project, regional, state, national or international level. ICMS are a cost classification system.

This project is the first of its kind with global coverage, bringing together numerous organisations from around the world to create shared international standards for presenting entire construction costs. This first edition of ICMS focuses on capital costs; however, future editions of ICMS may incorporate other matters such as costs-in-use.

Consistent practice in presenting construction costs globally will bring significant benefits to construction cost management. Globalisation of the construction business has increased the need to make meaningful comparative analysis between countries, not least by international organisations such as the World Bank Group, the International Monetary Fund, various regional development banks, non-governmental organisations and the United Nations.

The **Coalition** did not identify any existing standard that was suitable for international adoption. For this reason, the **Coalition** has come together to create a shared standard. Following earlier discussions, at a meeting at the International Monetary Fund in June 2015, **Coalition** members confirmed they were committed to promoting the implementation of ICMS to encourage world markets to accept and adopt ICMS as the primary standards for presenting construction costs across different nations in a consistent way.

An independent Standards Setting Committee (the SSC) was formed. The SSC includes technical experts from 16 countries and a combined expertise covering 47 different markets. The SSC worked virtually and also met three times, once in Brussels and twice in London.

The **Coalition** is a non-governmental, not-for-profit professional coalition. A wide range of professional organisations are represented in the **Coalition** and the SSC. They were generous in providing their national standards, which provided the basis for the early deliberations of the SSC.

The SSC produced the complete consultation draft of ICMS within a year, in July 2016. Following the private consultation period in October 2016, two public consultations took place between November 2016 and April 2017. The completed first edition was published in July 2017.

The **Coalition** accepts that standards setting is a continuous and dynamic process. It will be listening closely to the global construction cost management community to ensure necessary updates are captured for continued improvement. In addition to preparing further editions of ICMS for additional types of civil engineering projects, the SSC will also monitor all guidance notes on ICMS to ensure that they are consistent with the principles and intent of ICMS.

All local, regional or worldwide approaches will be documented to allow coordination, expansion and consistency of ICMS guidance whenever required.

The **Coalition** is beginning the important work of implementation by liaising with governments on a national, regional or state and local level to seek adoption of ICMS. Many key stakeholders are being engaged in the process of implementation. A list of ICMS-supporting partners is shown on the ICMS **Coalition** website (<https://icms-coalition.org/>) – these organisations are committed to the adoption of ICMS.

The **Coalition**, the SSC and the numerous participants in the consultation are proud to present ICMS.

For further information on ICMS please visit the website (<https://icms-coalition.org/>).

On behalf of the ICMS **Coalition** Trustees:

Ken Creighton – (Royal Institution of Chartered Surveyors) – Chair

Martin Darley – (Association for the Advancement of Cost Engineering) – Vice Chair

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Introduction

The International Construction Measurement Standards Coalition (the **Coalition**) was formed on 17 June 2015 after earlier discussions and a formal meeting at the International Monetary Fund in Washington DC, USA. The **Coalition**, comprising the organisations listed below at the date of publication, aims to bring about consistency in construction cost reporting standards internationally. This is achieved by the creation and adoption of the **ICMS**, agreed international standards for the structuring and presentation of cost reports. **ICMS** sets out a structure for describing construction costs in terms of project scope, attributes and values descriptors.

This document setting out the provisions of **ICMS** is the first prepared by the **Coalition's** Standards Setting Committee (the SSC). The **Coalition** members at the date of publication are:

- Africa Association of Quantity Surveyors (AAQS)*
- Association for the Advancement of Cost Engineering International (AACE)*
- Association of Cost Engineers (ACostE)*
- Association of South African Quantity Surveyors (ASAQS)*
- Australian Institute of Quantity Surveyors (AIQS)*
- Brazilian Institute of Cost Engineers (IBEC)*
- Building Surveyors Institute of Japan (BSIJ)*
- Canadian Institute of Quantity Surveyors (CIQS)*
- Chartered Institute of Building (CIOB)*
- Chartered Institution of Civil Engineering Surveyors (ICES)*
- China Electricity Council (CEC)*
- China Engineering Cost Association (CECA)*
- Commonwealth Association of Surveying and Land Economy (CASLE)*
- Conseil Europeen des Economistes de la Construction (CEEC)*
- Consejo General de la Arquitectura Técnica de España (CGATE)*
- Dutch Association of Quantity Surveyors (NVBK)*
- European Federation of Engineering Consultancy Associations (EFCA)*
- Federation Internationale des Geometres (FIG)*
- Ghana Institution of Surveyors (GhIS)*
- Hong Kong Institute of Surveyors (HKIS)*
- Ikatan Quantity Surveyor Indonesia (IQSI)*
- Indian Institute of Quantity Surveyors (IIQS)*
- Institute of Engineering and Technology (IET)*
- Institute of Quantity Surveyors of Kenya (IQSK)*
- Institute of Quantity Surveyors Sri Lanka (IQSSL)*
- Institution of Civil Engineers (ICE)*
- Institution of Surveyors Kenya (ISK)*
- International Cost Engineering Council (ICEC)*
- Italian Association for Total Cost Management (AICE)*
- Korean Institution of Quantity Surveyors (KIQS)*
- New Zealand Institute of Quantity Surveyors (NZIQS)*
- Nigerian Institute of Quantity Surveyors (NIQS)*
- Pacific Association of Quantity Surveyors (PAQS)*
- Philippine Institute of Certified Quantity Surveyors (PICQS)*
- Property Institute of New Zealand (PINZ)*
- Real Estate Institute of Botswana (REIB)*
- Royal Institute of British Architects (RIBA)*
- Royal Institution of Chartered Surveyors (RICS)*
- Royal Institution of Surveyors Malaysia (RISM)*
- Singapore Institute of Building Limited (SIBL)*
- Singapore Institute of Surveyors and Valuers (SISV)*
- Sociedad Mexicana de Ingeniería Económica, Financiera y de Costos*
- Society of Chartered Surveyors Ireland (SCSI)*
- Union Nationale des Economistes de la Construction (UNTEC)*

Construction organisations have been working internationally for many years. Research has shown, however, that different approaches to presenting the costs of construction can vary by as much as 25–30% due to inconsistent methodology and standards. Hence international standards are required to ensure global consistency in presenting the entire cost of construction projects.

The aim of the **Coalition** is to provide a structure and format for classifying, defining, measuring, analysing and presenting construction costs that will provide consistency and transparency across international boundaries. The SSC has focused only on issues directly related to the costs of construction so that cross-boundary costs can be benchmarked and the causes of differences in costs can be identified.

The **ICMS** project followed work on the development of International Property Measurement Standards (**IPMS**). **IPMS** established standards for measuring the floor areas of buildings. For **ICMS** a key element agreed by the **Coalition** members was that **ICMS** would be compatible and would accord with **IPMS**.

ICMS offer a framework against which costs can be classified, measured, recorded, analysed and presented. The hierarchical framework has four levels:

- Level 1: **Project or Sub-Project**
- Level 2: **Cost Category**
- Level 3: **Cost Group**
- Level 4: **Cost Sub-Group**

The composition of Levels 2 and 3 is the same for all **Projects** and **Sub-Projects**, although discretion is allowed in the contents of Level 4. Examples of the contents of Level 4 are given in Appendices A, B, C and D.

These **Standards** provide definitions, scope, attributes and values, units of measurement and explanatory notes for each type of **Project**. It provides guidance on:

- how the **Standards** are to be used
- the level of detail to be included
- the method of dealing with **Projects** comprising different **Sub-Projects** and
- the approach to be taken to ensure that like is compared with like, especially considering different currencies and time frames.

For buildings, the various cost analysis standards worldwide require the measurement of either gross external floor area (**GEFA**) or gross internal floor area (**GIFA**). This permits the representation of overall costs in terms of currency per **GEFA** or **GIFA**. Research shows that floor area measurement standards vary considerably between countries. The linking of **ICMS** with **IPMS** provides a valuable tool for overcoming these inconsistencies. **ICMS** require a cost report to include both **GEFA** (**IPMS 1**) and **GIFA** (**IPMS 2**) measured in accordance with the rules set out in **IPMS**. These are summarised in Appendix G.

For civil engineering projects, **ICMS** also provide units of measurement describing their physical sizes and functional capacities for the purposes of comparison.

The SSC prioritised setting a cost classification standard for buildings and selected types of civil engineering projects. The types of civil engineering projects chosen for this first edition of **ICMS** are those that are most commonly required and cover:

- road and rail transport
- energy
- oil and gas and
- the utility sectors.

Further types will be added in future editions. **ICMS** have been created through a transparent, detailed and inclusive standard-setting process by the SSC. Members of the SSC freely shared their expertise and knowledge of practices in their own countries and brought a broader understanding informed by their international experience. In addition, they drew upon the guidance of international correspondents. This resulted in a full analysis and appreciation of the standards and practices in many more countries than those directly represented by SSC members. **ICMS** are not a hybrid of those

standards but do introduce some concepts that may be new to some markets.

ICMS are high-level standards. Markets that do not have established standards are encouraged to adopt **ICMS**. Markets that do have established local standards should adopt **ICMS** to compare cost data prepared using different standards from different markets on a consistent, like-for-like basis. The aim of the SSC is not to replace existing local standards, but to provide an internationally accepted consistent framework into which data generated locally can be allocated for the purposes of comparison. In time, it is expected that **ICMS** will become the primary basis for both global and local construction cost reporting.

In drafting **ICMS**, the SSC has been conscious of the need for compatibility with other established or emerging standards. It has striven to strike a balance between the need for prescription to be compatible with other standards and the need for flexibility to accommodate the different cost classification systems that exist across the world.

Thus, the types of **Project** are generally compatible with the United Nations *International Standard Industrial Classification of all Economic Activities*. The **Cost Sub-Groups** are generally compatible with the elements in ISO 12006 *Building construction – Organization of information about construction works – Part 2: Framework for Classification*, and can be adapted to be compatible with most other breakdown systems such as Uniclass or Omniclass.

In addition, it has been recognised that a work breakdown structure (WBS) approach to cost reporting is widely used around the world, particularly in civil engineering. Therefore, examples of mapping to and from various national standards and WBS are included on the **Coalition** website (<https://icms-coalition.org/>).

ICMS Standards Setting Committee

In June 2015, the **Coalition** selected construction cost management experts from around the world to form its Standards Setting Committee (the SSC) to develop global standards for presenting construction costs.

The SSC comprises experts representing a wide range of construction professional organisations.

The SSC acts independently from the **Coalition** and its members.

The SSC members and co-authors of these Standards are:

Ong See-Lian (Malaysia)	Chairman
Alan Muse (UK)	Vice-Chairman
Gerard O’Sullivan (Republic of Ireland)	Executive Secretary
Alexander Aronsohn (UK)	
Dainna Baharuddin (Malaysia)	
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Anil Sawhney (India)	
Peter Schwanethal (UK)	
Koji Tanaka (Japan)	
Tang Ki-Cheung (Hong Kong)	

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Part 1 Context

1.1 Introduction

The aim of **ICMS** is to provide global consistency in classifying, defining, measuring, analysing and presenting entire construction costs at a project, regional, state, national or international level. **ICMS** allow:

- construction costs to be consistently and transparently benchmarked
- the causes of differences in costs between projects to be identified
- properly informed decisions on the design and location of construction projects to be made and
- data to be used with confidence for construction project financing and investment, decision-making, and related purposes.

This part provides definitions of terms commonly used throughout the Standards. Definitions specific to particular types of **Projects** are provided in Appendices A, B, C and D. This part also sets out the aim and use of the Standards.

1.2 Definitions

Associated Capital Costs

The payments, fees and charges payable for work and utilities off-site, post completion furniture, furnishing and equipment, and construction-related consultancies and supervision, but excluding costs associated with land acquisition and client's other costs associated with the realisation of the **Project**.

Base Date

The date at which costs are considered to apply without the need for any indexing.

Capital Construction Costs

Expenditure on labour, materials, plant, equipment, site and head office overheads and profit, including taxes and levies, incurred as a direct result of the construction intervention. It is the total price payable for work normally included in contracts to construct a building or civil engineering works, including any supplies by the **Client** for the **Constructor** to fix. It also includes all temporary works required to undertake the construction works.

Client

The entity that procures or provides site, commissions and pays **Service Providers** and **Constructors** to design and construct a **Project** on the site including, in some cases, funding, operating and maintaining the **Project**, and pays all other **Associated Capital Costs**.

Coalition

The International Construction Measurement Standards Coalition, comprising not-for-profit organisations, each with a public interest mandate.

Constructor

Organisation commissioned and paid by a **Client** to construct or implement the construction of a **Project** or part thereof including, in some cases, providing funding, design, management, maintenance and operation services.

Conversion date

The date or dates at which any currency conversion was made.

Cost Category

A division of **Project** or **Sub-Project** costs into **Capital Construction Costs**, **Associated Capital Costs** and **Site Acquisition and Client's Other Costs** currently, with further divisions for costs-in-use in the future editions of the Standards.

Cost Group

A division of costs under a **Cost Category** into a small number of broad groups to enable easy estimation or extraction of cost data for quick high-level comparison by design discipline or common purpose.

Cost Management Professional

A **Service Provider** competent to calculate, interpret, analyse, apportion and report using **ICMS**.

Cost Sub-Group

A division of costs under a **Cost Group** according to their functions or common purposes irrespective of their design, specification, materials or construction to enable the costs of alternatives serving the same function or common purpose to be compared, evaluated and selected.

GEFA

Gross external floor area measured according to **IPMS 1** as set out in **IPMS** and provided in Appendix G.

GIFA

Gross internal floor area measured according to **IPMS 2** as set out in **IPMS** and provided in Appendix G.

ICMS

International Construction Measurement Standards.

IPMS

International Property Measurement Standards. **IPMS** are the global standards that aim to enhance the transparency and consistency in the way **Property** is measured across markets. It was developed by the **IPMS Coalition**, an independent group of professional bodies from around the world.

Major Refurbishment

Substantial modification of, or improvement to, the main parts of an existing building or civil engineering works to bring them up to an acceptable standard or to accommodate a change in-use. Major extension is to be treated as new build.

Price Level Adjustment

An allowance for the increases or decreases in the price levels, due to inflation, escalation or deflation, over a defined period.

Project

A series of, or single, construction intervention(s) with a single purpose or common purposes commissioned by a **Client**, or group of **Clients**, with a defined start and end date. A **Project** may comprise a number of **Sub-Projects**.

Project Attributes

The principal characteristics of a **Project** or **Sub-Project** relating to time, cost, scope of works, design, quality, quantity, procurement, location and other contextual features that might impact its cost.

Project Complexity

The relative intricacy of a **Project** or **Sub-Project** by reference to its form, design, site constraints, method or timing of construction.

Project Quantities

The physical quantities (numbers, lengths, areas, volumes and weights), functional quantities (capacities, inputs, outputs) and degree of repetition required to be captured in the **Project Attributes** and **Project Values** such that the costs of different projects or design schemes can be converted to a unit cost per the desired **Project Quantity** for evaluation and comparison. Both are required for each **Project** or **Sub-Project**.

Project Values

A standard set of descriptions and/or measurements for each of the **Project Attributes**.

Property

Any real estate asset in the built environment.

Risk Allowance

A quantitative allowance set aside as a precaution against risks and future needs to allow for uncertainty of outcome. Risk is an uncertain event or circumstance that, if it occurs, may affect the outcome of a **Project**.

Site Acquisition and Client's Other Costs

All payments required to acquire the site, excluding physical construction, and all other expenses associated with project realisation, from inception to putting the **Project** into use, and which are not part of the **Capital Construction Costs** or **Associated Capital Costs**.

Service Provider

Any organisation or individual providing construction advice, or a service, to a **Client** including, but not limited to, project managers, architects, engineers, technical architects or

engineers, surveyors, **Cost Management Professionals**, constructors, facilities managers, planners, valuers, property managers, asset managers, agents and brokers.

Sub-Project

A sub-division of a **Project** that can be described by a single set of attributes and values.

Taxes and Levies

Mandatory costs taxed or levied in connection with the **Project** by national governments, states, municipalities or governmental organisations, using the whole or part of the construction contract payments as the chargeable base, whether paid by the **Client** or the **Constructor**.

Total Capital Cost

The total of **Capital Construction Costs**, **Associated Capital Costs** and **Site Acquisition and Client's Other Costs** for a **Project** or **Sub-Project**.

1.3 Use of the Standards

ICMS can be used for any purpose agreed between a **Client** and a **Service Provider**.

Where a cost report has been prepared in compliance with ICMS, this should be stated in the report.

ICMS can be used to analyse and compare historic, present and future costs of new build and **Major Refurbishment** programmes and projects. ICMS are not intended, at present, to cover maintenance and repair costs.

Applications include, but are not limited to:

- global investment decisions
- international, national, regional or state cost comparisons
- feasibility studies and development appraisals
- project work including cost planning and control, cost analysis, cost modelling and the procurement and analysis of tenders
- dispute resolution work
- reinstatement costs for insurance and
- valuation of assets and liabilities.

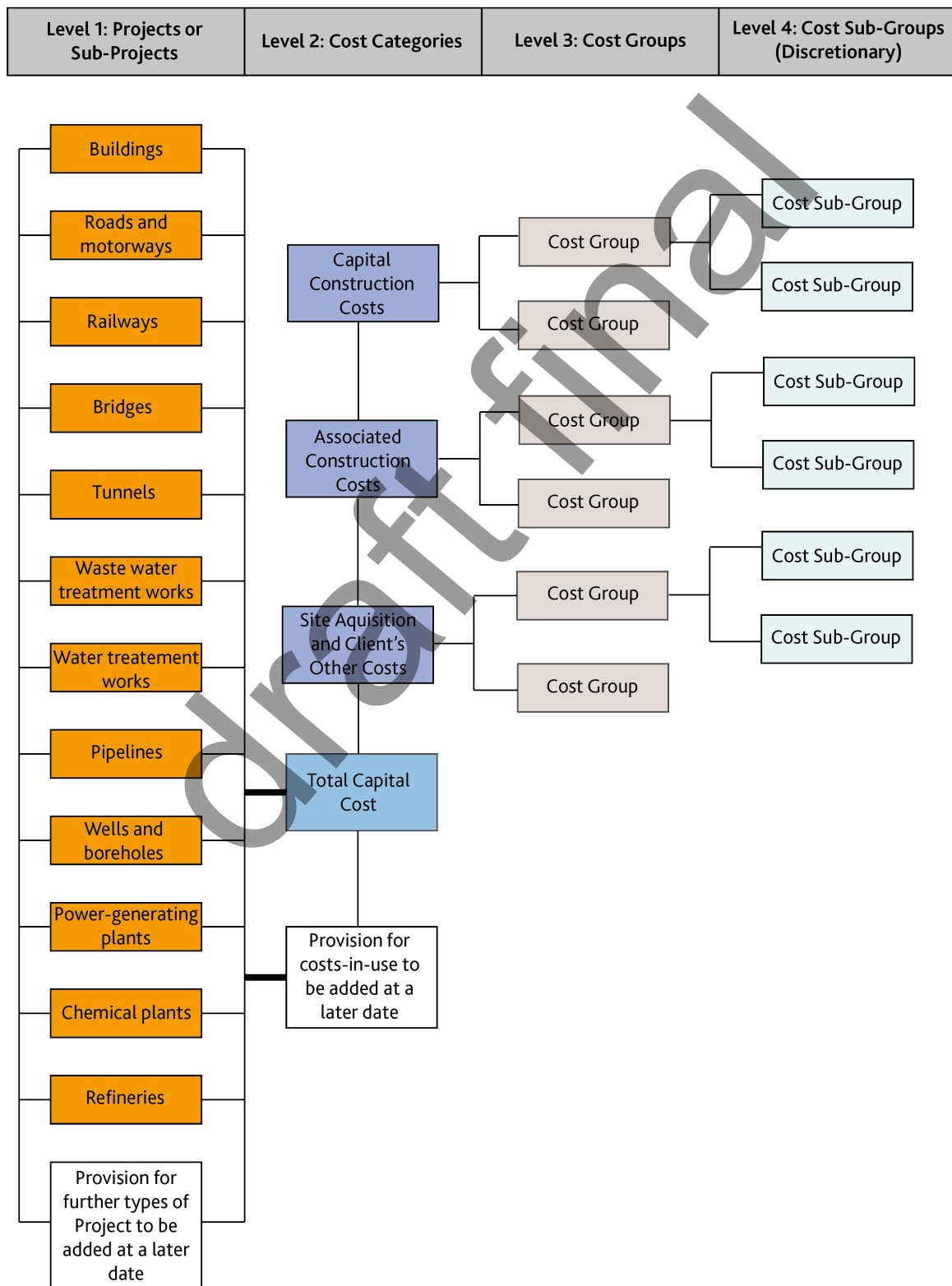
Process flow charts to clarify the use of the Standards are provided in Appendix E.

Part 2 ICMS Framework

2.1 Introduction

Conceptually, the overall framework of ICMS is as shown in Figure 1.

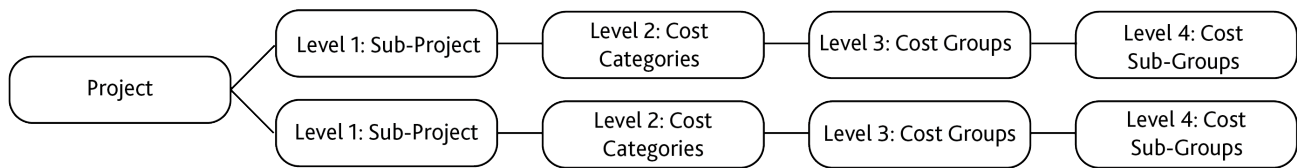
Figure 1: ICMS Framework



2.2 Hierarchical Levels

Using this framework, the hierarchical levels of ICMS are as shown in Figure 2.

Figure 2: ICMS Hierarchy



The description of each level in Figure 2 is as follows:

Project and Sub-Project (Level 1)

ICMS classify **Projects** according to their essence and principal purpose. The **Projects** shown in the framework are not exhaustive and will be the subject of further development in future editions of the Standards.

When a **Project** cannot be described by a single set of **Project Attributes** and **Project Values**, it is to be sub-divided for cost reporting into **Sub-Projects** each described by a single set of **Project Attributes** and **Project Values**.

Cost Categories and Cost Groups (Levels 2 and 3)

The **Cost Categories** at Level 2 and **Cost Groups** at Level 3, as defined in Table 1, are mandatory and standardised for all **Projects** to enable high-level comparison between different **Projects** and **Sub-Projects**.

Table 1: Definitions of Cost Categories (Level 2) and Cost Groups (Level 3)

- Accepted alternative terms are separated with a vertical slash (/).
- All individual costs reported should be those paid or payable by the **Client** and include the payees' overheads and profits where applicable.
- All **Cost Groups** under **Associated Capital Costs** should include their relevant taxes and levies.

Cost code	Description
	Cost Categories (Level 2)
	Cost Groups (Level 3)
0	Total Capital Cost (1 + 2 + 3)
1	Capital Construction Costs
1.01	Demolition, site preparation and formation <ul style="list-style-type: none"> • Scope: All necessary advance or facilitating work to prepare, secure and form the site to enable substructure construction.
1.02	Substructure <ul style="list-style-type: none"> • Scope: All the load-bearing work underground or underwater up to and including the following (including related earthwork, lateral support beyond site formation, and non-load-bearing components forming an integral part of composite load-bearing work) and as illustrated in Schedule 2: <ul style="list-style-type: none"> – for buildings: lowest floor slabs, and basement sides and bottom including related waterproofing and insulation – for roads and motorways: sub-base to pavements – for railways: sub-base to rail track structures – for bridges: pile caps, footings, bases nearest ground level or water level if constructed in water – for tunnels: external faces of structural tunnel linings – for tanks and the like underground: external faces of tanks – for tanks and the like above ground: bases supporting tanks – for pipelines underground: beds and surrounds to underground pipes – for pipelines above ground: bases to structures supporting pipes – for wells and boreholes: bases to structures supporting well heads.

Cost code	Description
1.03	Structure <ul style="list-style-type: none"> • Scope: All the load-bearing work, including non-load-bearing components forming an integral part of composite load-bearing work, excluding that included in Substructure and Architectural works.
1.04	Architectural works | Non-structural works <ul style="list-style-type: none"> • Scope: All architectural and non-load-bearing work excluding services, equipment and underground drainage.
1.05	Services and equipment <ul style="list-style-type: none"> • Scope: All fixed services and equipment required to put the completed project into use, whether they are mechanical, hydraulic, plumbing, fire-fighting, transport, communication, security, electrical or electronic, excluding external underground drainage.
1.06	Surface and underground drainage <ul style="list-style-type: none"> • Scope: All external surface and underground drainage systems specifically serving the Project.
1.07	External and ancillary works <ul style="list-style-type: none"> • Scope: All work outside the external face of buildings or beyond the construction required to fulfil the primary function of the Project and not included in other Cost Groups.
1.08	Preliminaries | Constructor's site overheads | general requirements <ul style="list-style-type: none"> • Scope: Constructor's site management, temporary site facilities, site services, and expenses, not directly related to a particular Cost Group, but commonly required to be shared by all Cost Groups.
1.09	Risk Allowances <ul style="list-style-type: none"> • Scope: Those as defined in section 1.2 but related to Capital Construction Costs and not included in other Cost Groups.
1.10	Taxes and Levies <ul style="list-style-type: none"> • Scope: As defined in section 1.2.
2	Associated Capital Costs
2.01	Work and utilities off-site <ul style="list-style-type: none"> • Scope: All payments to government authorities or public utility companies to connect public work and utilities to the site, or services diversions, to enable the Project.
2.02	Post-completion loose furniture, fittings and equipment <ul style="list-style-type: none"> • Scope: Those provided for the Project to perform its function close to or after completion.
2.03	Construction-related consultancies and supervision <ul style="list-style-type: none"> • Scope: Fees and charges payable to Service Providers not engaged by the Constructors.
2.04	Risk Allowances <ul style="list-style-type: none"> • Scope: Those as defined in section 1.2 but related to Associated Capital Costs and not included in other Cost Groups.
3	Site Acquisition and Client's Other Costs
3.01	Site acquisition <ul style="list-style-type: none"> • Scope: All payments required to acquire the site, excluding physical construction.
3.02	Administrative, finance, legal and marketing expenses <ul style="list-style-type: none"> • Scope: All other expenses associated with Project realisation, from inception to putting the Project into use and which are not part of the Capital Construction Costs or Associated Capital Costs.

Cost Sub-Groups (Level 4)

The costs of components of a **Project** or **Sub-Project** under each **Cost Group** serving a specific function or common purpose are grouped into one **Cost Sub-Group**, such that the costs of alternatives serving the same function can be compared, evaluated and selected. **Cost Sub-Groups** are chosen irrespective of their design, specification, materials or construction.

These Standards do not mandate the classification of the **Cost Sub-Groups** (Level 4), but the following appendices provide examples of what might be included:

- Appendix A – **Cost Sub-Groups: Buildings**
- Appendix B – **Cost Sub-Groups: Civil Engineering Works**
- Appendix C – **Cost Sub-Groups: Associated Capital Costs**
- Appendix D – **Cost Sub-Groups: Site Acquisition and Client's Other Costs**

Users of these Standards may adopt a **Cost Sub-Group** classification based on trades, work breakdown structure or work results according to their local practice.

Cost codes

Cost codes are a unique identifier for digital purposes. They have been assigned to the ICMS hierarchy down to Level 4. However, since the classification of the **Cost Sub-Groups** at Level 4 is not mandatory, the cost codes there may be suitably adjusted.

2.3 Project Attributes and Project Values

To enable consistent and concise evaluation and comparison between different **Projects** or different design schemes, these Standards provide a set of **Project Attributes** and **Project Values** in Schedule 1 describing the principal characteristics of each **Project** or **Sub-Project**.

Costs should, as far as practicable, be stated in their payment currencies. When it is necessary to carry out a currency conversion, the exchange rates or conversion factors used and the applicable dates should be stated.

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Schedule 1 Project Attributes and Project Values for Each Type of Project and Sub-Project

Notes:

1. All values should be given so long as the attributes are relevant.
2. Alternative values are separated with a vertical slash (|). More than one alternative value may be chosen.
3. All quantities should be rounded to the nearest whole number unless considered inappropriate in special circumstances.
4. These **Project Attributes** and **Project Values** capture the minimum principal cost-significant characteristics of a **Project** or **Sub-Project**. Users may add more **Project Attributes** and **Project Values** to suit their needs.
5. The values of functional units refer to the designed values.

Project Attributes	Project Values
Common (Project level only)	
Report	
Project title	
Status of cost report	pre-construction forecast | at tender | during construction | actual costs of construction post-completion
Date of cost report	(month and year)
Revision number of cost report	
Brief description of the Project	
• client's name	
• main Project type (principal Sub-Project)	
• brief scope	
Location and country	International Organisation for Standardisation (ISO) country code (e.g. CN) | address of building site(s) | start and end locations for linear civil engineering works
Sub-Projects included	buildings | roads and motorways | railways | bridges | tunnels | waste water treatment works | water treatment works | pipelines | wells and boreholes | power-generating plants | chemical plants | refineries | common | other stated
Price Level	
ISO currency code	(e.g. USD)
Base date of costs	(month and year)
Price basis	fixed | fluctuating
Currency Conversion	
Conversion date	
Exchange rates or other conversion factors (used to convert a cost report of multi-currencies into a single currency)	(numeric conversion and currency codes)
Programme	
Project status	initiation and concept phase | design phase | construction and commissioning phase | complete
Construction period	
• number of months	
• from	start of demolition and site preparation | other stated (month and year)

Project Attributes	Project Values
• to state	completion of commissioning | other stated (month and year)
• key milestones and dates	<ul style="list-style-type: none"> • description • month and year
Site	
Existing site status	
• state of use	greenfield | brownfield
• type of use	urban | rural | agricultural
Legal status of site	freehold | leasehold | joint venture | not owned | other stated
Site topography	principally flat | principally hilly | mountainous | offshore | other stated
Ground conditions	soft | rocky | reclaimed
Site conditions and constraints	
• access problems	difficult | average | easy
• extreme climatic conditions	difficult | average | easy
• environmental constraints	difficult | average | easy
Procurement	
Funding	private | public | public and private in partnership
Project delivery	
• pricing method	lump sum stipulated price | re-measurement | cost reimbursement | other stated
• mode of procurement	design bid build | design and build (turnkey) | build operate and transfer | public private partnership | management contracting | construction management | engineer procure construct | target | other stated
• joint venture foreign Constructor	yes no
• predominant source of Constructors	local foreign

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Buildings	
(A construction with a cover and enclosure to house people, equipment or goods)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type	residential | office | commercial | shopping centre | industrial | hotel | car park | warehouse | educational | hospital | airport terminal | railway station | ferry terminal | plant facility | other stated
Nature	new build | major refurbishment | temporary
Grade (qualitative description to be read in conjunction with the location)	ordinary quality | medium quality | high quality
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• structural (predominant)	timber | concrete | steel | load-bearing masonry | other stated
• external walls (predominant)	stone | brick/block | render/block | curtain walling | other stated
• environmental control	non-air conditioned | air conditioning
• degree of prefabrication	less than 25% | up to 50% | up to 75% | up to 100%, of Capital Construction Costs
Project Complexity	
• shape (on plan)	circular, elliptical or similar | square, rectangular, or similar | complex
• design	simple | bespoke | complex
• method of working	sectional completion | out-of-hours working | confined working | other stated
Design life	(years)
Average height of site above or below sea level	(m | ft)
Dimensions (overall length × width × height of each building to highest point of the building)	(m | ft)
Typical storey height (floor level to floor level)	(m | ft)
Other storey heights and applicable floors	(m | ft)
Storeys above ground (qualitative description to be read in conjunction with the location)	house | low rise | medium rise | high rise
Storeys above ground (quantitative)	specific number | 0–3 | 4–7 | 8–20 | 20–30 | 30–50 | over 50
Storey below ground	specific number
Project Quantities	
Site area (within legal boundary of building site, excluding temporary working areas outside the site)	(m ² | ft ²)
Covered area on plan	(m ² | ft ²)
Gross external floor area as IPMS 1	(m ² | ft ²)
Gross internal floor area as IPMS 2	(m ² | ft ²)
Functional units	number of occupants | number of bedrooms | number of hospital beds | number of hotel rooms | number of car parking spaces | number of classrooms | number of students | number of passengers | number of boarding gates | other stated

Roads and motorways	
(A pavement providing a thoroughfare, route, or way for vehicular traffic on land between two or more places including but not limited to alley, street, collector and rural roads, motorways, county and interstate highways. Elevated roads and motorways that are an integral part of bridges shall be included in bridges)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type	motorway | highway | freeway | expressway | road | lane
Nature	new build | major refurbishment | temporary
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• position	at grade | in cutting | in tunnel | on embankment | elevated
• design speed	(km | miles per hour)
• number of carriageways	
• number of lanes per carriageway	
• lane width	(m | ft)
• hard shoulders	yes | no
• footways	yes | no
• footway width	(m | ft)
• surfacing	flexible construction | concrete pavement
• vertical profile	switchbacks | undulating | flat
• plan profile	straight | winding
Project Complexity	
• number of grade-separated intersections	
• number of at-grade intersections	
• number of crossings over other roads, railways, waterways, valleys and the like	
• number of access ramps	
Design life	(years)
Altitude	
• minimum height of passageway above or below sea level	(m | ft)
• maximum height of passageway above or below sea level	(m | ft)
Dimensions	
• total width of metalled surface of each road or motorway (including hard shoulders but excluding footways)	(m | ft)
• total length (between two places, irrespective of number of lanes)	(km | miles)
Project Quantities	
Total paved area	(m ² | ft ²)
Functional units	
• capacity	(vehicles per hour)

Railways	
(A permanent way, rail track composed of two parallel rails fixed to sleepers, or single monorail that includes spurs, sidings and turnouts for train traffic or the like, including tramways, metro rails, light rails and other rapid mass transit systems)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type	high speed | express | light rail | tram | freight | mixed traffic | other stated
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• position	at grade | in tunnel | elevated | other stated
• design speed	(km | miles per hour)
• maximum axle loading of traffic	(t)
• train power systems	overhead AC | overhead DC | third or contact rail(s) DC | diesel electric | other stated
• number of tracks	(number)
• track gauge	(m | ft)
• construction rigidity	flexible | rigid
• rail joints	fish-plated | welded
• control system	European Train Control System | in cab | block signalling | centralized traffic control | other stated
• signalling system	European Railway Traffic Management System | semaphore | coloured light
Project Complexity	
• number of intersections with roads and other railways	
• number of crossings over roads, other railways, waterways, valleys and the like	
Design life	(years)
Altitude	
• minimum height of track bed above or below sea level	(m | ft)
• maximum height of track bed above or below sea level	(m | ft)
Dimensions	
• average width of rail corridor between legal boundaries	(m | ft)
Project Quantities	
Route length (between two places, irrespective of number of tracks)	(km | miles)
Equated track length (being the length of all tracks along the route, including those in passing loops, sidings and depots reduced to a single length)	(km | miles)
Functional units	
• weight of traffic expressed as estimated gross million tonnes or tons per annum	(M tonnes M tons/year)
• passenger journeys	(million journeys per year)

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Bridges	
(A structure designed to span across a physical obstacle)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type (serving)	roads | rail | conveyors | pipeline | canal | pedestrians | other stated
Nature	new build | major refurbishment | temporary
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• support	arch | post and beam | cantilever | suspension | cable-stayed | other stated
• mobility	fixed | movable | temporary
• spans	number of abutments, piers and towers
• materials	natural materials | wood | concrete | steel | advanced materials | other stated
Types of obstacles crossed	river and canal | roads and motorways | railways | other stated
Project Complexity	
• curvature (predominant)	straight | curved
• number of access ramps	
• number of abutments/piers/towers with foundations in water	
Design life	(years)
Altitude	
• average height of deck above or below sea level	above | below (m | ft)
Dimensions	
• width (including walkways, hard shoulders and the like)	(m | ft)
• maximum height above the lowest point land/water	(m | ft)
• minimum clearance height	(m | ft)
• deck length measured from face to face of abutments	(km | miles)
Project Quantities	
Surface area of deck	(m ² | ft ²)
Functional units	
• capacity	(vehicles | litres | gallons | tonnes | tons per hour)

Tunnels	
(An artificial underground or underwater passageway, completely enclosed except for openings for entrance and exit, commonly at each end, and for ventilation)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type	road | railway | pipeline | conveyor | other stated
Nature	new build | major refurbishment | temporary
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• tunnelling method	cut and fill | tunnel-boring machine | drill and blast | immersed | other stated
• in compressed air	yes | no
• lining	iron | steel | concrete | not lined
• curvature (predominant)	straight | curved | other stated
• underwater	yes | no
• ventilated	yes | no
• number of passages separated by a dividing wall	
• average depth below water or ground level	(m | ft)
Project Complexity	
• number of intersections	
• horizontal profile (predominant)	flat | undulating
• cross sectional shape	circular | oval | rectangular | other stated
Design life	(years)
Altitude	
• minimum height of passageway above or below sea level	(m | ft)
• maximum height of passageway above or below sea level	(m | ft)
Dimensions	
• overall cross section area of the tunnel (range stated in case of varying cross sections)	(m ² | ft ²)
• overall dimensions (width x height | diameter) (range stated in case of varying cross sections)	(m | ft)
• length (end to end)	(km | miles)
Project Quantities	
Volume of excavation	(m ³ | yd ³).
Functional units	
• capacity	(vehicles | litres | gallons | tonnes | tons per hour)

Waste water treatment works	
(A facility for the cleaning and improvement of water that contains waste products, contaminants or pollutants to make it safe for discharge to land or water)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type (descriptions of primary, secondary and tertiary treatment processes)	
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• plant technology	
• number of processes	
• tank materials for each process	steel | concrete | other stated
• term of use	fixed | temporary
Project Complexity	
• standard of cleanliness of treated water	
Design life	(years)
Altitude	
• average height of site above or below sea level	(m | ft)
Dimensions	
• overall external diameter or length x width x height of each major structure	(m | ft)
Project Quantities	
Site area (area of land covered by permanent work, excluding temporary working areas outside the site)	(hectares acres)
Functional units	
• capacity	(litres gallons per day)

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Water treatment works	
(A facility for the cleaning and improvement of water to make it potable)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type (descriptions of processes involved)	screening | pre-ozonation | coagulation | flocculation | clarification | filtration | pH correction | chemical dosing | chlorination | other stated
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• plant technology	
• number of processes	
• tank materials for each process	steel | concrete | other stated
• term of use	fixed | temporary
Project Complexity	
• standard of cleanliness of treated water	
Design life	(years)
Altitude	
• average height of site above or below sea level	(m | ft)
Dimensions	
• overall external diameter or length x width x height of each major structure	(m | ft)
Project Quantities	
Site area (area of land covered by permanent work, excluding temporary working areas outside the site)	(hectares acres)
Functional units	
• capacity	(litres gallons per day)

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Pipelines	
(A series of pipes and tubing for the transfer of liquid, gas or powder)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type (for transporting)	liquid | gas | powder
Nature	new build | major refurbishment | temporary
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• principal materials	steel | cast iron | precast concrete | uPVC | other stated
• minimum and maximum depths below ground	(m | ft)
• minimum and maximum heights above ground	(m | ft)
• drilling/boring method	cut and cover | directional drilling/boring
• insulation type, if insulated	
• corrosion protection measures	
Project Complexity	
• position	on land | underwater
• number of intersections	
• number of specials	
• number of crossings over roads, railways, waterways, valleys and the like	
• number of pumping stations, inspection points, pressure relief points	
Design life	(years)
Altitude	
• minimum height above or below sea level	(m | ft)
• maximum height above or below sea level	(m | ft)
Dimensions	
• number and diameter of each pipe	(m | ft)
Project Quantities	
Length of pipes (sum of number x each length)	(km | miles)
Length from servicing inlets to outlets	(km | miles)
Functional units	
• capacity	(litres | gallons | m ³ | ft ³ per hour)

Wells and boreholes	
(Process of drilling or boring in the ground for extraction of a natural resource or the injection of a fluid or for the evaluation/monitoring of subsurface formations)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type (for extracting)	water | gas | oil | other stated
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• lining material	steel | concrete | other stated
Project Complexity	
• position	onshore | offshore
• direction	vertical | directional
Design life	(years)
Altitude	
• commencing height above sea level	(m | ft)
• commencing height below sea level	(m | ft)
Dimensions	
• number of wellheads	
• numbers of each diameter of drilled/bored holes	(m | ft)
• vertical length drilled/bored (sum of number x each depth)	(m | ft)
• inclined or horizontal length drilled/bored (sum of number x each length)	(m | ft)
Project Quantities	
Length of drilled/bored depth	(m ft)
Functional units	
• capacity	(m ³ ft ³ litres gallons per hour)

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Power-generating plants	
(A facility for the generation of electrical power. Major buildings and civil engineering works shall be reported under separate Sub-Projects under a power-generating plant Project)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type	nuclear | wind power | solar power | hydroelectric | geothermal | biomass | gas | coal | oil | other stated
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• generator containment material	concrete | steel | other stated
• coolant	water | gas | other stated
• cycle	open | close
• number and size of turbines	(MW)
Project Complexity	
• cooling system	wind | water | other stated
Design life	(years)
Altitude	
• average height of site above or below sea level	above | below
	(m | ft)
Dimensions	
• overall external diameter or length × width × height of each major structure	(m | ft)
Project Quantities	
Site area (area of land covered by permanent work, excluding temporary working areas outside the site)	(hectares acres)
Functional units	
• capacity	(MW)

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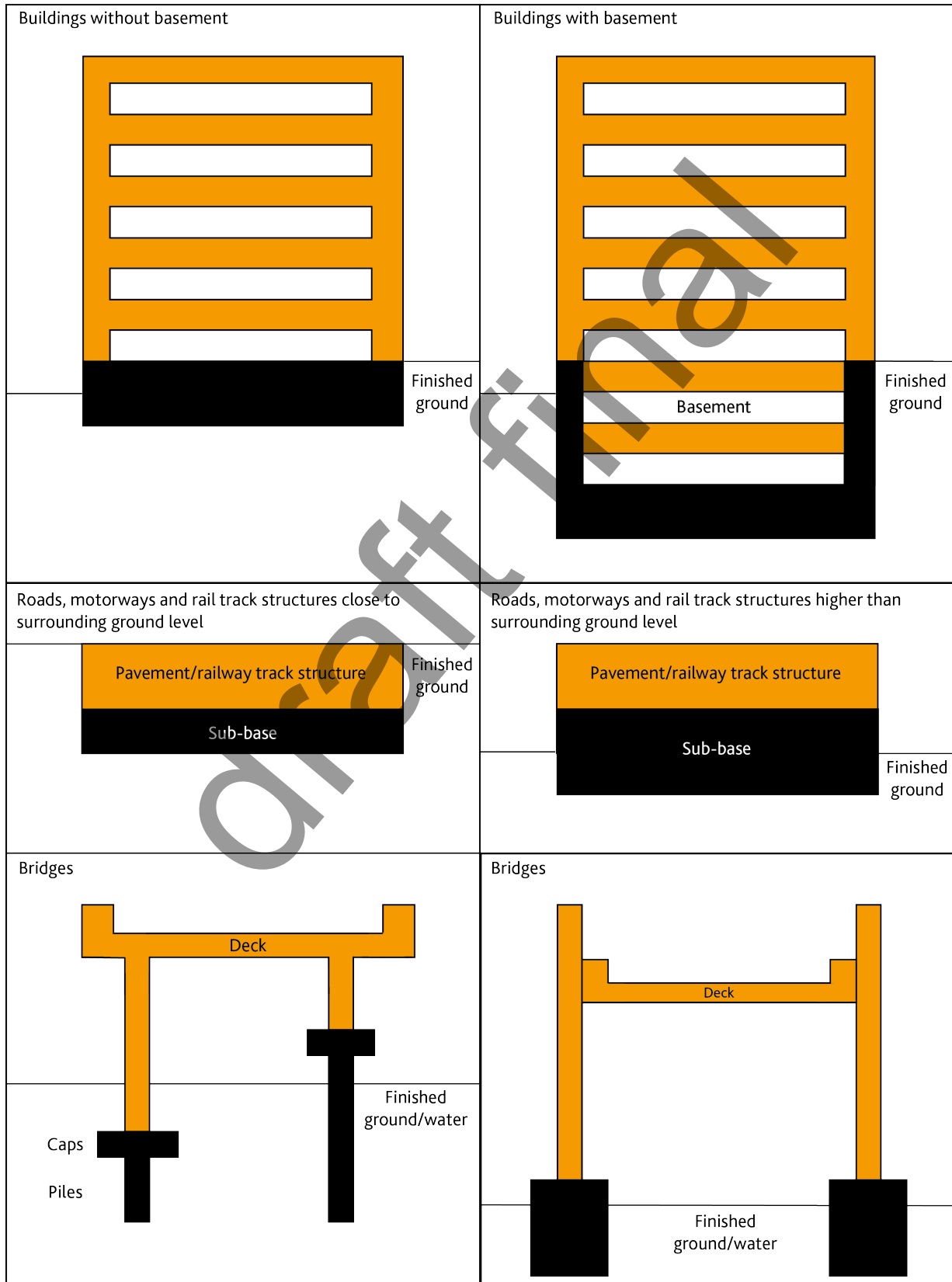
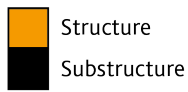
Chemical plants	
(A facility for the creation of chemical products excluding petro-chemicals. Major buildings and civil engineering works shall be reported under separate Sub-Projects under a chemical plant Project)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type (product description)	
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• principal processes	oxidation | reduction | hydrogenation | dehydrogenation | hydrolysis | hydration | dehydration | halogenation | nitrification | sulphonation | ammoniation | alkaline fusion | alkylation | dealkylation | esterification | polymerization | polycondensation | catalysis | other stated
• principal reactor materials	mild steel | stainless steel | concrete | other stated
Project Complexity	
• number of processes	
Design life	(years)
Altitude	
• average height of site above or below sea level	(m | ft)
Dimensions	
• overall external diameter or length x width x height of each major structure	(m | ft)
Project Quantities	
Site area (area of land covered by permanent work, excluding temporary working areas outside the site)	(hectares | acres)
Functional units	
• output of product	(m ³ ft ³ tonnes tons litres gallons per day)

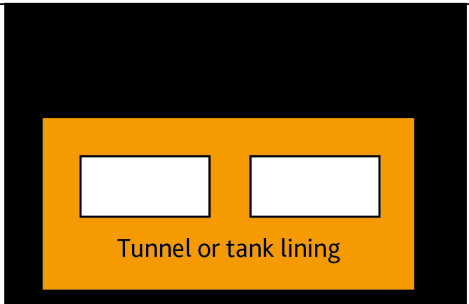
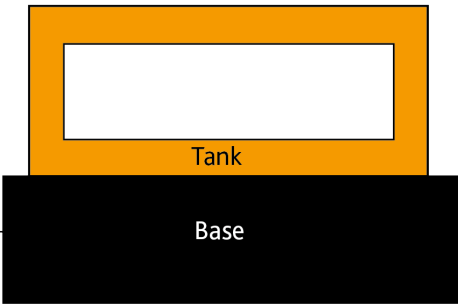


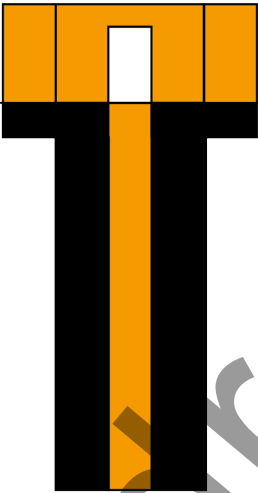
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Refineries	
(A downstream facility for the creation of petro-chemical products. Major buildings and civil engineering works shall be reported under separate Sub-Projects under a refinery Project. Wells and boreholes are upstream and Pipelines are midstream)	
Code	
Local functional classification standard	
• name of standard	
• code number of construction	
Works	
Functional type	oil | petrol | other stated
Nature	new build | major refurbishment
Environmental grade	
• grade and name of environmental certification	
• status	targeted | achieved | none
Principal design features	
• principal processes	upstream | downstream
• principal reactor materials	mild steel | stainless steel | concrete | other stated
Project Complexity	
• number of processes	
• number of products	
Design life	(years)
Altitude	
• average height of site above or below sea level	above | below
	(m | ft)
Dimensions	
• overall external diameter or width x height of each major structure	(m | ft)
Project Quantities	
Site area (area of land covered by permanent work, excluding temporary working areas outside the site)	(hectares | acres)
Functional units	
• input of crude oil	(tonnes tons litres gallons barrels per day)
• output of product	(tonnes tons litres gallons barrels per day)

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Schedule 2 Substructure and Structure Delineation for Each Type of Project and Sub-Project



<p>Tunnels and tanks underground</p>	<p>Tanks above ground</p>
 <p>Finished ground</p> <p>Tunnel or tank lining</p>	 <p>Tank</p> <p>Base</p> <p>Finished ground</p>
<p>Pipelines underground</p>	<p>Pipelines above ground</p>
 <p>Base and surround</p> <p>Finished ground</p>	 <p>Finished ground</p>
<p>Wells and boreholes</p>	<p>Waste water treatment works, water treatment works, power-generation plants, chemical plants and refineries</p> <p>Use the same principles as illustrated above</p>
 <p>Finished ground</p>	

Appendices

General notes

- a. Accepted alternative terms are separated with a vertical slash (|). Bullet points under **Cost Sub-Groups** serve to illustrate the scope but without limitation.
- b. Allocate costs to their most relevant **Sub-Project**, **Cost Group** and **Cost Sub-Group** as far as possible without omissions or duplications. Add a separate **Sub-Project** called 'Common' to capture costs that are common to all or most **Sub-Projects** and which should better be shown separately to permit reallocation in the appropriate way when the specific need arises.
- c. Add a **Cost Sub-Group** 'All Other Costs' within the relevant **Cost Group** to take account of the costs of those **Cost Sub-Groups** whose value is insufficient to warrant a separate **Cost Sub-Group** (typically whose value is less than 5% of the relevant **Cost Group**).
- d. All costs should represent those payable by the **Client** and include the payees' overheads and profits where applicable.
- e. Include design fees payable by the **Constructors** under **Capital Construction Costs**, and those not payable under **Associated Capital Costs**.
- f. Group costs of preparatory or enabling work with the principal items they are serving.
- g. Group costs of ancillary items, such as temporary lateral supports/temporary drainage/dewatering/slope treatment and protection for earthwork, falsework/formwork/reinforcement for concrete work, ironmongery/hardware, fixing accessories, inline fittings for pipes/drains/conduits/cables, painting/coating, etc. with their principal items unless otherwise shown as a **Cost Sub-Group**. Group costs of testing and commissioning with the relevant services.
- h. Round off costs suitably and commensurate with the accuracy of the amounts.
- i. State 'Excluded' if the cost exists but is not reported. State 'N/A' (not applicable) if the cost does not exist.
- j. Apportion the costs of cost code 1.08–1.10 into cost code 1.01–1.07 in case of simplified presentation.
- k. As the **Project** develops, the **Risk Allowances** under cost code 1.09 may be gradually expended and the expended costs would be reflected in the costs of other items. The allowances may be explicitly shown in the **Constructor's** contract sum build-up or reserved in the **Client's** own budget not known to the **Constructor**. For cost reports on actual costs after construction, any surplus allowances should not be included.
- l. The 'Design development allowance' under cost code 1.09 is an allowance in a pre-construction forecast estimate or cost plan for unforeseen extra costs due to the development of the design as it evolves. Once the design is complete, this allowance should become zero.
- m. The 'Construction contingencies' under cost code 1.09 is an allowance for unforeseen extra costs during construction. Typically, it is to cover unforeseen events after awarding a construction contract. After the completion of the final account for the construction contract, this allowance should become zero.
- n. Typically, a pre-construction cost estimate may be prepared based on the price level at a certain date, which may be current at the time of preparing the estimate or at an earlier base date, with or without allowance for the possible increases or decreases due to inflation or deflation during construction. A construction contract may be priced based on the price levels at a certain **Base Date** around the time of tendering and permit adjustments for rises or falls in the costs during construction. A provisional allowance should be made inside or outside the contract for the possible increase or decrease, and should gradually be replaced with the actual outcome. The 'Price Level Adjustments' under cost code 1.09 are to allow for the aforesaid possible change until the time of tendering, and further change during construction.

Appendix A – Cost Sub-Groups: Buildings

Cost code	Description	Note
	Cost Category (Level 2)	
	Cost Group (Level 3)	
	Cost Sub-Group (Level 4)	
1	Capital Construction Costs	
1.01	Demolition, site preparation and formation	
1.01.010	Site survey and investigation	
1.01.020	Environmental treatment	
1.01.030	Sampling for construction, geophysical, geological or similar purposes	
1.01.040	Temporary fencing	
1.01.050	Demolition of existing buildings and support to adjacent structures	
1.01.060	Site surface clearance (clearing, grubbing, topsoil stripping, tree felling, minor earthwork, removal)	
1.01.070	Tree transplant	
1.01.080	Site formation and slope treatment	
1.01.090	Temporary surface drainage and dewatering	
1.01.100	Temporary protection, diversion and relocation of public utilities	
1.02	Substructure	
1.02.010	Foundation piling and underpinning: 010 – mobilisation and demobilisation 020 – trial piles and caisson 030 – permanent piles and caisson 040 – pile and caisson testing 050 – underpinning	
1.02.020	Foundations up to top of lowest floor slabs: 010 – excavation and disposal 020 – lateral supports 030 – raft footings, pile caps, column bases, wall footings, strap beams, tie beams 040 – substructure walls and columns 050 – lowest floor slabs and beams (excluding basement bottom slabs) 060 – lift pits	

Cost code	Description	Note
1.02.030	Basement sides and bottom: 010 – excavation and disposal 020 – lateral supports 030 – bottom slabs and blinding 040 – sides 050 – vertical waterproof tanking, drainage blanket, drains and skin wall 060 – horizontal waterproof tanking, drainage blanket, drains and topping slab 070 – insulation 080 – lift pits, sump pits, sleeves	
1.03	Structure	
1.03.010	Structural removal and alterations	
1.03.020	Basement suspended floors (up to top of ground floor slabs): 010 – structural walls and columns 020 – beams and slabs 030 – staircases	
1.03.030	Frames and slabs (above top of ground floor slabs): 010 – structural walls and columns 020 – upper floor beams and slabs 030 – roof beams and slabs 040 – staircases 050 – fireproofing to steel structure	
1.03.040	Tanks, pools, sundries	
1.04	Architectural works | Non-structural works	
1.04.010	Non-structural removal and alterations	
1.04.020	External elevations: 010 – non-structural external walls and features 020 – external wall finishes except cladding 030 – facade cladding and curtain walls 040 – external windows 050 – external doors 060 – external shop fronts 070 – roller shutters and fire shutters	
1.04.030	Roof finishes, skylights and landscaping (including waterproofing and insulation): 010 – roof finishes 020 – skylights 030 – other roof features 040 – roof landscaping (hard and soft)	

Cost code	Description	Note
1.04.040	Internal divisions: 010 – non-structural internal walls and partitions 020 – shop fronts 030 – toilet cubicles 040 – moveable partitions 050 – cold rooms 060 – internal doors 070 – internal windows 080 – roller shutters and fire shutters 090 – sundry concrete work	
1.04.050	Fittings and sundries: 010 – balustrades, railings and handrails 020 – staircases and catwalk not forming part of the structure, cat ladders 030 – cabinets, cupboards, shelves, counters, benches, notice boards, blackboards 040 – exit signs, directory signs 050 – window and door dressings 060 – decorative features 070 – interior landscaping 080 – access panels, fire service cabinets 090 – sundries	
1.04.060	Finishes under cover: 010 – floor finishes (internal and external) 020 – internal wall finishes and cladding 030 – ceiling finishes and false ceilings (internal or external)	
1.04.070	Builder's work in connection with services: 010 – plinth, bases 020 – fire-proofing enclosure 030 – hoisting beams, lift pit separation screens 040 – suspended manholes 050 – cable trenches, trench covers 060 – sleeves, openings and the like not allowed for in 'Fittings and sundries'	
1.05	Services and equipment	
1.05.010	Heating, ventilating and air-conditioning systems/air conditioners: 010 – seawater system 020 – cooling water system 030 – chilled water system 040 – heating water system 050 – steam and condensate system 060 – fuel oil system 070 – water treatment	

Cost code	Description	Note
	080 – air handling and distribution system 090 – condensate drain system 100 – unitary air-conditioning system 110 – mechanical ventilation system 120 – kitchen ventilation system 130 – fume-extraction system 140 – anaesthetic gas-extraction system 150 – window and split-type air conditioners 160 – air-curtains 170 – fans 180 – related electrical and control systems 190 – submissions, testing and commissioning	
1.05.020	Electrical services: 010 – high-voltage transformers and switchboards 020 – incoming mains, low-voltage transformers and switchboards 030 – mains and submains 040 – standby system 050 – lighting and power 060 – uninterruptible power supply 070 – electric underfloor heating 080 – local electrical heating units 090 – earthing/lightning protection and bonding 100 – submissions, testing and commissioning	
1.05.030	Fitting out lighting fittings	
1.05.040	Extra low voltage electrical services: 010 – communications 020 – staff paging/location 030 – public address system 040 – building automation 050 – security and alarm 060 – close circuit television 070 – communal aerial broadcast distribution and the like 080 – submissions, testing and commissioning	

Cost code	Description	Note
1.05.050	Water supply and above ground drainage: 010 – cold water supply 020 – hot water supply 030 – flushing water supply 040 – grey water supply 050 – cleansing water supply 060 – irrigation water supply 070 – rainwater disposal 080 – soil and waste disposal 090 – planter drainage disposal 100 – kitchen drainage disposal 110 – related electrical and control systems 120 – submissions, testing and commissioning	
1.05.060	Supply of sanitary fittings	
1.05.070	Disposal systems: 010 – refuse 020 – laboratory waste 030 – industrial waste 040 – incinerator 050 – submissions, testing and commissioning	
1.05.080	Fire services: 010 – fire hydrant and hose reel system 020 – wet risers 030 – sprinkler system 040 – deluge system 050 – gaseous extinguishing system 060 – foam extinguishing system 070 – audio/visual advisory system 080 – automatic fire alarm and detection system 090 – portable hand-operated appliances 100 – related electrical and control systems 110 – submissions, testing and commissioning	

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Cost code	Description	Note
1.05.090	Gas services: 010 – coal gas 020 – natural gas 030 – liquid petroleum gas 040 – medical gas/laboratory gas 050 – industrial gas/compressed air/instrument air 060 – vacuum 070 – steam 080 – submissions, testing and commissioning	
1.05.100	Movement systems: 010 – lifts | elevators 020 – platform lifts 030 – escalators 040 – travellers | moving walkways 050 – conveyors 060 – submissions, testing and commissioning	
1.05.110	Gondolas	
1.05.120	Turntables	
1.05.130	Generators	
1.05.140	Energy-saving features	
1.05.150	Waste water treatment	
1.05.160	Fountains, pools and filtration plant	
1.05.170	Powered building signage	
1.05.180	Kitchen equipment	
1.05.190	Cold room equipment	
1.05.200	Laboratory equipment	
1.05.210	Medical equipment	
1.05.220	Hotel equipment	
1.05.230	Car park or entrances access control	
1.05.240	Domestic appliances	
1.05.250	Other specialist services	
1.05.260	Builder's profit and attendance on services	
1.06	Surface and underground drainage	
1.06.010	Surface water drainage	
1.06.020	Storm water drainage	
1.06.030	Foul water drainage	
1.06.040	Drainage disconnections and connections	
1.06.050	CCTV inspection of existing or new drains	
1.07	External and ancillary works	
1.07.010	Permanent retaining structures	
1.07.020	Site enclosures and divisions	
1.07.030	Ancillary structures	
1.07.040	Roads and paving	

Cost code	Description	Note
1.07.050	Landscaping (hard and soft)	
1.07.060	Fittings and equipment	
1.07.070	External services: 010 – water supply 020 – gas supply 030 – power supply 040 – communications supply 050 – external lighting 060 – utility disconnections and connections	
1.08	Preliminaries | Constructor's site overheads | general requirements	(j)
1.08.010	Construction management including site management staff and support labour	
1.08.020	Temporary access roads and storage areas, traffic management and diversion (at the Constructors' discretion)	
1.08.030	Temporary site fencing and securities	
1.08.040	Commonly shared construction plant	
1.08.050	Commonly shared scaffolding	
1.08.060	Other temporary facilities and services	
1.08.070	Technology and communications: telephone, broadband, hardware, software	
1.08.080	Constructor's submissions, reports and as-built documentation	
1.08.090	Quality monitoring, recording and inspections	
1.08.100	Safety, health and environmental management	
1.08.110	Insurances, bonds, guarantees and warranties	
1.08.120	Constructor's statutory fees and charges	
1.08.130	Testing and commissioning	
1.09	Risk Allowances	(j), (k)
1.09.010	Design development allowance	(l)
1.09.020	Construction contingencies	(m)
1.09.030	Price Level Adjustments: 010 – until tendering 020 – during construction	(n)
1.09.040	Exchange rate fluctuation adjustments	
1.10	Taxes and Levies	(j)
1.10.010	Paid by the Constructor	
1.10.020	Paid by the Client in relation to the construction contract payments	

Appendix B – Cost Sub-Groups: Civil Engineering Works

Cost code	Description	Civil Engineering Works											Note	
		Roads and motorways	Railways	Bridges	Tunnels	Waste water treatment works	Water treatment works	Pipelines	Wells and boreholes	Power generating plants	Chemical plants	Refineries		
	Cost Category (Level 2)													
	Cost Group (Level 3)													
	Cost Sub-Group (Level 4)													
1	Capital Construction Costs													
1.01	Demolition, site preparation and formation													
1.01.010	Site survey and investigation	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.020	Environmental treatment	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.030	Sampling for construction, geophysical, geological or similar purposes	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.040	Temporary fencing	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.050	Demolition of existing structures and support to adjacent structures	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.060	Site surface clearance (clearing, grubbing, topsoil stripping, tree felling, minor earthwork, removal)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.070	Tree transplant	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.080	General site formation and slope treatment	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.090	Temporary surface drainage and dewatering	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.100	Temporary access roads and storage areas (provided under an advance contract)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.01.110	Temporary protection, diversion and relocation of public utilities	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02	Substructure													
1.02.010	Embankments/cuttings	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.020	Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.030	Trenching	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.040	Drilling/boring	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.050	Piling/anchoring	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.060	Structural backfill/ground remediation	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.070	Earth-retaining structures	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.080	Abutments/wing walls	.	.	.	.	.	.	.	.	.	.	.	.	.

Cost code	Description												Note	
		Roads and motorways	Railways	Bridges	Tunnels	Waste water treatment works	Water treatment works	Pipelines	Wells and boreholes	Power generating plants	Chemical plants	Refineries		
1.02.090	Pile caps/footings/bases (nearest to the ground level or water level if constructed in water)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.02.100	Sub-base to pavements and rail track structures	.	.											
1.02.110	Bases to supports for tanks, pipes, well heads and the like					.	.	.	.	.	.	.	.	.
1.02.120	Beds and surrounds to underground pipes					.	.	.	.	.	.	.	.	.
1.03	Structure													
1.03.010	Piers and towers			.										
1.03.020	Suspension system			.										
1.03.030	Decks			.										
1.03.040	Bearings			.										
1.03.050	Tunnel lining				.									
1.03.060	Road/track base	.	.	.	.					
1.03.070	Pavement	.	.	.	.					
1.03.080	Service roads and approaches	.	.	.	.					
1.03.090	Parapets/edge treatment	.	.	.	.					
1.03.100	Main structures					.	.	.	.	.	.	.	.	.
1.03.110	Tanks, rigs, storage containers and the like					.	.	.	.	.	.	.	.	.
1.03.120	Supports for tanks, pipes and the like					.	.	.	.	.	.	.	.	.
1.03.130	Civil pipework					.	.	.	.	.	.	.	.	.
1.03.140	Valves and fittings					.	.	.	.	.	.	.	.	.
1.04	Non-structural works													
1.04.010	Non-structural removal and alterations	.	.	.	.	.	.	.	.	.	.	.	.	.
1.04.020	Non-structural construction					.	.	.	.	.	.	.	.	.
1.04.030	Running surface	.	.	.	.					
1.04.040	Signage, markings and the like	.	.	.	.					
1.04.050	Gantries and the like	.	.	.	.					
1.04.060	Safety facilities	.	.	.	.	.	.	.	.	.	.	.	.	.
1.04.070	Barriers/rails and means of access	.	.	.	.	.	.	.	.	.	.	.	.	.
1.04.080	Special equipment and fittings	.	.	.	.	.	.	.	.	.	.	.	.	.
1.04.090	Interior landscaping	.	.	.	.	.	.	.	.	.	.	.	.	.
1.04.100	Builder's work in connection with services	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05	Services and equipment													
1.05.010	Mechanical systems	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.020	Lighting systems	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.030	Illuminations	.	.	.	.					

Cost code	Description												Note	
		Roads and motorways	Railways	Bridges	Tunnels	Waste water treatment works	Water treatment works	Pipelines	Wells and boreholes	Power generating plants	Chemical plants	Refineries		
1.05.040	Low-voltage power supply	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.050	High-voltage power supply	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.060	Cables/cable trays	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.070	Other electrical services	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.080	Control systems and instrumentation	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.090	Pipe racks/supports	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.100	Water supply and above ground drainage	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.110	Fire services	.	.	.	.	.	.	.	.	.	.	.	.	.
1.05.120	Movement systems: lifts/elevators/ conveyors	.	.	.	.	.	.	.	.	.	.	.	.	.
1.06	Surface and underground drainage	.	.	.	.	.	.	.	.	.	.	.	.	.
1.06.010	Surface water drainage	.	.	.	.	.	.	.	.	.	.	.	.	.
1.06.020	Storm water drainage	.	.	.	.	.	.	.	.	.	.	.	.	.
1.06.030	Foul water drainage	.	.	.	.	.	.	.	.	.	.	.	.	.
1.06.040	Pumping systems	.	.	.	.	.	.	.	.	.	.	.	.	.
1.06.050	Drainage connections	.	.	.	.	.	.	.	.	.	.	.	.	.
1.07	External and ancillary works	.	.	.	.	.	.	.	.	.	.	.	.	.
1.07.010	Site enclosures and divisions	.	.	.	.	.	.	.	.	.	.	.	.	.
1.07.020	Ancillary structures	.	.	.	.	.	.	.	.	.	.	.	.	.
1.07.030	Roads and paving (not amounting to a Sub-Project)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.07.040	Landscaping (hard and soft)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.07.050	Fittings and equipment	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08	Preliminaries | Constructor's site overheads | general requirements													(j)
1.08.010	Construction management including site management staff and support labour	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.020	Temporary access roads and storage areas, traffic management and diversion (at the Constructors' discretion)	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.030	Temporary site fencing and securities	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.040	Commonly shared construction plant	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.050	Commonly shared scaffolding	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.060	Other temporary facilities and services	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.070	Technology and communications: telephone, broadband, hardware, software	.	.	.	.	.	.	.	.	.	.	.	.	.
1.08.080	Constructor's submissions, reports and as-built documentation	.	.	.	.	.	.	.	.	.	.	.	.	.

Cost code	Description	Roads and motorways	Railways	Bridges	Tunnels	Waste water treatment works	Water treatment works	Pipelines	Wells and boreholes	Power generating plants	Chemical plants	Refineries	Note
1.08.090	Quality monitoring, recording and inspections	.	.	.	.	.	.	.	.	.	.	.
1.08.100	Safety, health and environmental management	.	.	.	.	.	.	.	.	.	.	.
1.08.110	Insurances, bonds, guarantees and warranties	.	.	.	.	.	.	.	.	.	.	.
1.08.120	Constructor's statutory fees and charges	.	.	.	.	.	.	.	.	.	.	.
1.08.130	Testing and commissioning	.	.	.	.	.	.	.	.	.	.	.
1.09	Risk Allowances												(j), (k)
1.09.010	Design development allowance	.	.	.	.	.	.	.	.	.	.	.	(l)
1.09.020	Construction contingencies	.	.	.	.	.	.	.	.	.	.	.	(m)
1.09.030	Price level adjustments 010 – until tendering 020 – during construction	.	.	.	.	.	.	.	.	.	.	.	(n)
1.09.040	Exchange rate fluctuation adjustments	.	.	.	.	.	.	.	.	.	.	.
1.10	Taxes and Levies												(j)
1.10.010	Paid by the Constructors	.	.	.	.	.	.	.	.	.	.	.
1.10.020	Paid by the Client in relation to the construction contract payments	

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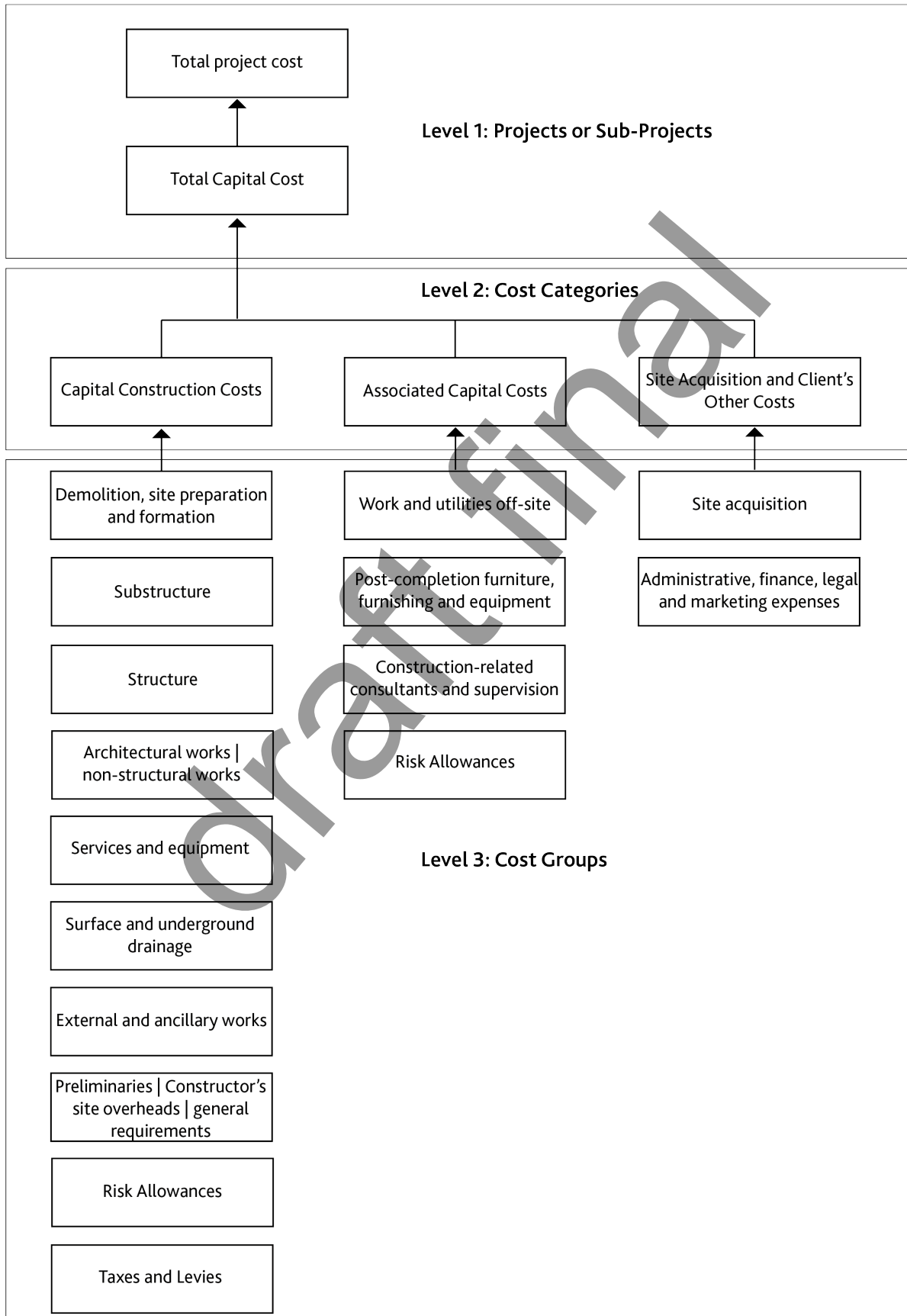
Appendix C – Cost Sub-Groups: Associated Capital Costs

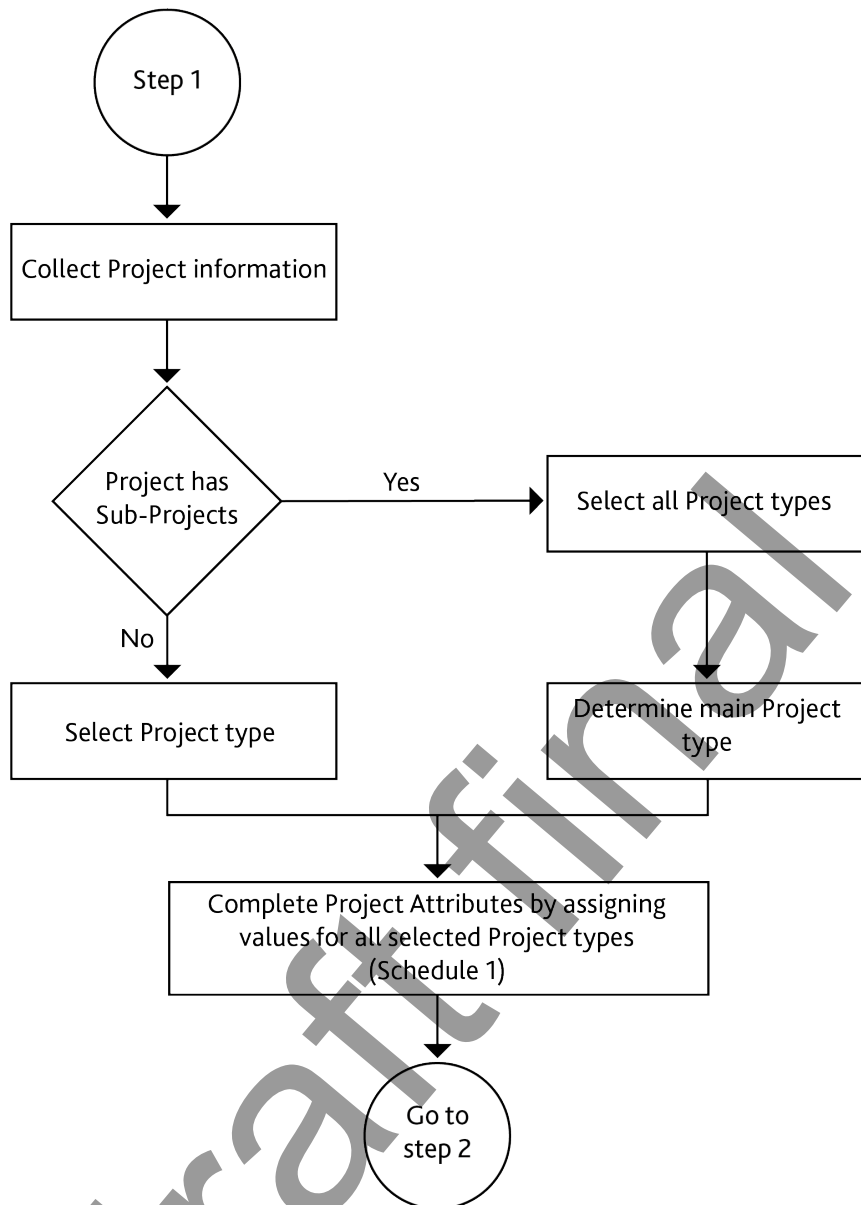
Code code	Description
	Cost Category (Level 2)
	Cost Group (Level 3)
	Cost Sub-Group (Level 4)
2	Associated Capital Costs
2.01	Work and utilities off-site
2.01.010	Connections to, diversion of and capacity enhancement of public utility mains or sources off-site up to mains connections on-site: 010 – electricity 020 – transformers 030 – water 040 – sewer 050 – gas 060 – telecommunications
2.01.020	Public access roads and footpaths
2.02	Post-completion loose furniture, fittings and equipment
2.02.010	Production, process, operating and loose furniture, furnishing and equipment not normally provided before completion of construction
2.03	Construction-related consultants and supervision
2.03.010	Consultants' fees and reimbursable: 010 – architects (architectural, landscape, interior design, technical, etc.) 020 – engineers (geotechnical, civil, structural, mechanical, electrical and plumbing, technical, etc.) 030 – project managers 040 – surveyors (quantity surveying, land surveying, building surveying, cost engineering, etc.) 050 – specialist consultants (environmental, traffic, acoustic, facade, BIM, etc.) 060 – value management studies
2.03.020	Charges and levies payable to statutory bodies or their appointed agencies (in connection with planning, design, tender and contract approvals, supervision and acceptance inspections)
2.03.030	Site supervision charges (including their accommodation and travels)
2.03.040	Payments to testing authorities or laboratories
2.04	Risk Allowances

Appendix D – Cost Sub-Groups: Site Acquisition and Client’s Other Costs

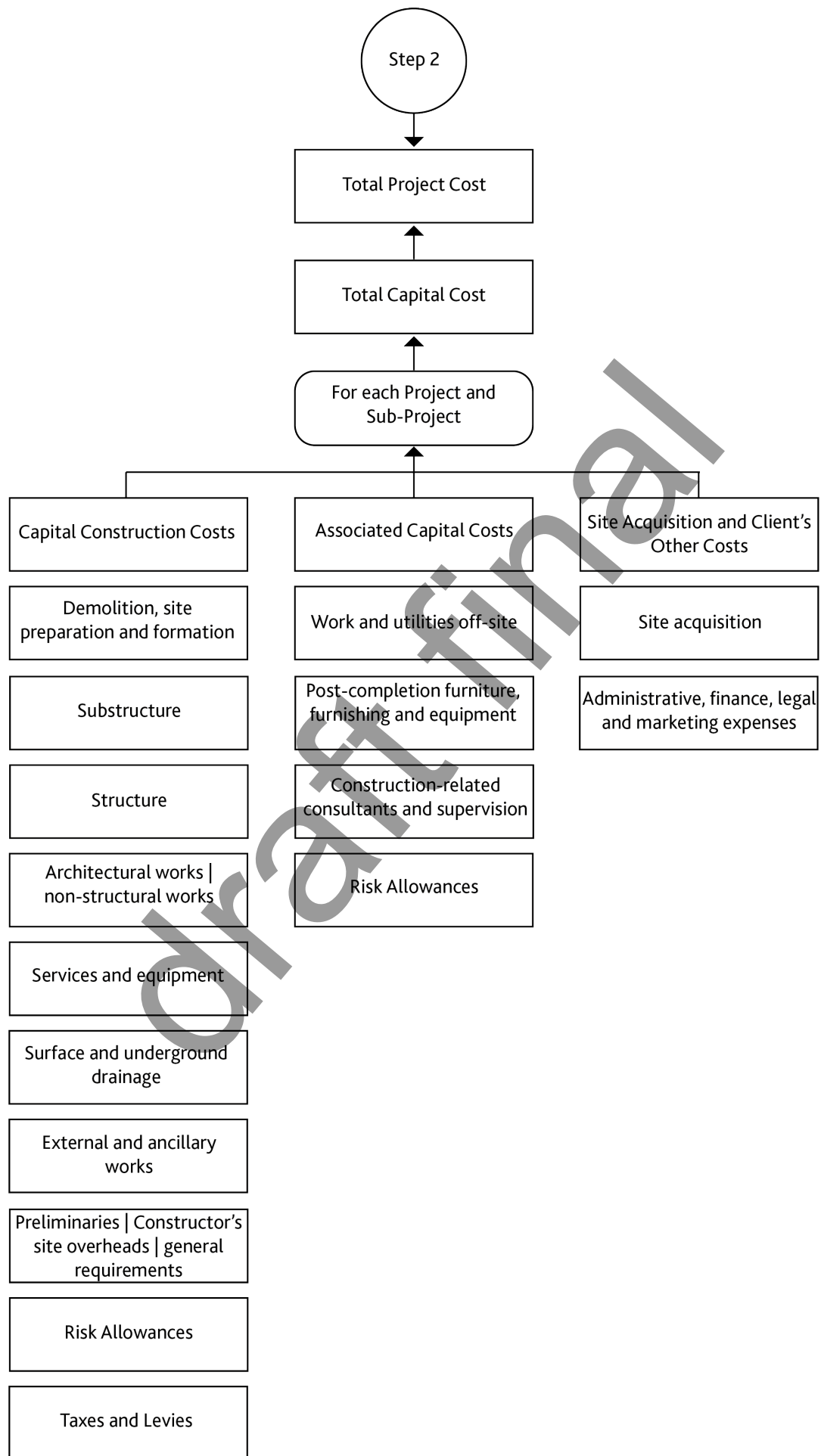
Code code	Description
	Cost Category (Level 2)
	Cost Group (Level 3)
	Cost Sub-Group (Level 4)
3	Site Acquisition and Client’s Other Costs
3.01	Site acquisition
3.01.010	Costs and premium required to procure site including additional cost and premium to be paid by foreign investors
3.01.020	Compensation to existing occupiers
3.01.030	Demolition, removal and modification of existing properties by way of payment to existing owners instead of carrying out physical work
3.01.040	Contributions for the preservation of heritage, culture and environment
3.01.050	Related fees to agents, lawyers, and the like
3.01.060	Related taxes and statutory charges
3.02	Administrative, finance, legal and marketing expenses
3.02.010	Client’s general office overheads
3.02.020	Client’s project-specific administrative expenses: 010 – in-house project management and design team 020 – supporting project staff 030 – project office venue, furniture and equipment if not included in Constructor’s preliminaries | site overheads 040 – stores and workshops 050 – safety and insurances 060 – staff training 070 – accommodation and travelling expenses for in-house team and external parties
3.02.030	Interest and finance costs
3.02.040	Legal expenses
3.02.050	Accounting expenses
3.02.060	Sales, leasing, marketing, advertising and promotional expenses
3.02.070	Taxes and statutory charges related to sales and lease
3.02.080	Licence and permit charges for operation and use

Appendix E – Process Flow Charts





draft



Appendix F – Reporting Templates

Specific notes

- **Project Attributes** and **Project Values** are not shown in this example, but should be provided in the actual cost report.
- '\$M' = \$ million.

Building project

- Columns for the unit cost calculated using additional project quantities may be added if required.

Cost code	Description	Buildings			
		\$M	\$/m ²	\$/m ²	% of '0'
	Project Quantity				
			IPMS 1 Floor Area (m ²)	IPMS 2 Floor Area (m ²)	
0	Total Capital Cost ('1' + '2' + '3')				
1	Capital Construction Costs				
1.01	Demolition, site preparation and formation				
1.02	Substructure				
1.03	Structure				
1.04	Architectural works | non-structural works				
1.05	Services and equipment				
1.06	Surface and underground drainage				
1.07	External and ancillary works				
1.08	Preliminaries | Constructor's site overheads | general requirements				
1.09	Risk Allowances				
1.10	Taxes and Levies				
2	Associated Capital Costs				
2.01	Work and utilities off-site				
2.02	Post-completion furniture, furnishing and equipment				
2.03	Construction-related consultants and supervision				
2.04	Risk Allowances				
3	Site Acquisition and Client's Other Costs				
3.01	Site acquisition				
3.02	Administrative, finance, legal and marketing expenses				

Comparison between two design schemes

Additional columns may be added as appropriate.

Cost code	Description	Scheme A				Scheme B				B-A		
		\$M	\$/m ²	\$/m ²	% of '0'	\$M	\$/m ²	\$/m ²	% of '0'	\$M	\$/m ²	\$/m ²
	Project Quantity											
			IPMS 1 Floor Area (m ²)	IPMS 2 Floor Area (m ²)			IPMS 1 Floor Area (m ²)	IPMS 2 Floor Area (m ²)			IPMS 1 Floor Area (m ²)	IPMS 2 Floor Area (m ²)
0	Total Capital Cost ('1' + '2' + '3')											
1	Capital Construction Costs											
1.01	Demolition, site preparation and formation											
1.02	Substructure											
1.03	Structure											
1.04	Architectural works | non-structural works											
1.05	Services and equipment											
1.06	Surface and underground drainage											
1.07	External and ancillary works											
1.08	Preliminaries | Constructor's site overheads | general requirements											
1.09	Risk Allowances											
1.10	Taxes and Levies											
2	Associated Capital Costs											
2.01	Work and utilities off-site											
2.02	Post-completion furniture, furnishing and equipment											
2.03	Construction-related consultants and supervision											
2.04	Risk Allowances											
3	Site Acquisition and Client's Other Costs											
3.01	Site acquisition											
3.02	Administrative, finance, legal and marketing expenses											

Project with Sub-Projects

Additional columns for other **Sub-Projects** may be added as appropriate.

A set of columns for 'Common' may be added before the 'Total' to show the costs that may be spread across all or most **Sub-Projects**. These costs may be shown separately to permit reallocation in the appropriate way when the need arises.

Cost code	Description	Sub-Project								Total	
		Hotel			Apartment			Roads and motorways			
		\$M	\$/m ²	\$/m ²	\$M	\$/m ²	\$/m ²	\$M	\$/m	\$M	% of '0'
	Project Quantity										
			IPMS 1 Floor Area (m ²)	IPMS 2 Floor Area (m ²)		IPMS 1 Floor Area (m ²)	IPMS 2 Floor Area (m ²)		Road Length (m)		
0	Total Capital Cost ('1' + '2' + '3')										
1	Capital Construction Costs										
1.01	Demolition, site preparation and formation										
1.02	Substructure										
1.03	Structure										
1.04	Architectural works | non-structural works										
1.05	Services and equipment										
1.06	Surface and underground drainage										
1.07	External and ancillary works										
1.08	Preliminaries | Constructor's site overheads | general requirements										
1.09	Risk Allowances										
1.10	Taxes and Levies										
2	Associated Capital Costs										
2.01	Work and utilities off-site										
2.02	Post-completion furniture, furnishing and equipment										
2.03	Construction-related consultants and supervision										
2.04	Risk Allowances										
3	Site Acquisition and Client's Other Costs										
3.01	Site acquisition										
3.02	Administrative, finance, legal and marketing expenses										

Appendix G – Interface with International Property Measurement Standards (IPMS)

Measurement of Floor Areas for Buildings for ICMS Cost Reports

The various cost analysis standards worldwide require the measurement of a gross floor area (either external (GEFA) or internal (GIFA)) or similar variations thereof to permit the representation of overall costs in terms of currency per floor area. However, even though the use of these terms is commonly understood, the definitions and interpretations of these terms are also subject to considerable regional variations.

Measurement guidelines and definitions vary considerably between countries. Linking ICMS with IPMS provides a valuable tool for overcoming these inconsistencies. ICMS require a cost report to include both GEFA (IPMS 1) and GIFA (IPMS 2) measured in accordance with the rules set out in IPMS.

IPMS are evolving on a building-sector basis (offices, residential, retail, etc.). These rules are summarised below, but reference to the specific Standard, for the particular building type, is recommended.

IPMS 1: Gross external floor area

Use

IPMS 1 is used for measuring the area of a building including external walls. IPMS 1 is consistent for all building types.

Definition

IPMS 1 is the sum of the areas of each floor of a building measured to the outer perimeter of external construction features, which may be reported on a component-by-component basis for each floor of a building. The definition is the same for all classes of building.

Inclusions

IPMS 1 'includes all areas and walls, columns, and enclosed walkways or passages between separate Buildings, available for direct or indirect use. Covered void areas such as atria are only included at their lowest floor level.'

'In the absence of external construction features, for example an open-sided Building or a free-standing canopy, IPMS 1 is to be measured to the Covered Area.'

'If there are no available plans for a basement, the area must include an estimation of the exterior wall thickness.'

Measurements included but stated separately

'Balconies, Verandas, internal Catwalks, Sheltered Areas and internal Permanent Mezzanines are included. They are to be measured to their outer face and their areas are to be stated separately.'

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Exclusions

Measurement for IPMS 1 is not to include the area of temporary mezzanines, open light wells or the upper level voids of an atrium, open external stairways that are not an integral part of the structure, for example, an open framework fire escape, external areas such as external vehicle parking, external catwalks, vehicle circulation and other areas or structures (such as equipment yards, cooling equipment, refuse areas), and patios and decks at ground level.

Measurement for IPMS 1 excludes any other ground-level areas or structures beyond the covered area. Such areas may be measured and stated separately.

IPMS 2: Gross internal floor area

Use

IPMS 2 is used for measuring the interior area of a building. Currently, IPMS 2 only deals with certain building types, although a multi-use IPMS is intended to be published in the future. However, the principles can be used for all building types and these are summarised below.

Definition

IPMS 2 is the sum of the area of each floor of a building measured to the internal dominant face (IDF), which may be reported on a component-by-component basis for each floor of a building. For the purposes of ICMS, the definition is the same for all classes of building.

Inclusions

IPMS 2 'includes all areas within the IDF including internal walls, columns and enclosed walkways or passages between separate Buildings, available for direct or indirect use. Covered void areas such as atria are only included at their lowest floor level.'

Measurements included but stated separately

'Balconies, internal Catwalks, covered galleries, internal Loading Bays internal Permanent Mezzanines and Verandas. They are to be measured to their Finished Surface and their areas are to be stated separately.'

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Exclusions

Measurement for IPMS 2 is not to include any ground-level areas or structures beyond the external wall such as sheltered areas, external catwalks and external loading bays, temporary mezzanines or open light wells and the upper-level voids of an atrium.

Such areas may be measured and stated separately.

Appendix H – Bibliography

- Eurostat: <http://ec.europa.eu/eurostat>
- *International Property Measurement Standards (IPMS)*: www.ipmsc.org
- *International Standard Industrial Classification of all Economic Activities (ISIC Rev.,4)*: <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27>
- Prices and purchasing power parities: www.oecd.org/std/prices-ppp/
- ISO 12006-2: 2015, *Building construction – Organization of information about construction works. Part 2: Framework for classification*
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- ISO 6707-1: 2014, *Buildings and civil engineering works – Vocabulary – Part 1: General terms*
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