

DOH Health Facility Guidelines 2019 Part H – Costing



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Introduction

Financial sustainability is an important factor in the consideration of Healthcare projects. The consideration of Costs at an early stage will be required in order to complete a robust Feasibility Plan (as indicated in Part F).

Costing has two key aspects, Capital Cost (Construction Cost) and Recurrent Cost (Running Cost).

The Capital cost will affect the size and quality of the project as well as the capacity of the investor to fund the initial construction. Recurrent Cost affects the profitability in the short and long term. An early assessment of both Capital and Recurrent cost is necessary in order to ensure a successful and realistic project.

Discussions of Costing for hospitals are often confused due to a multitude of methodologies and terminologies used. Depending on the methodology or context of discussion some elements of cost may be included or excluded. The calculation methodology may even vary between experienced Quantity Surveyors. This makes benchmarking and comparison harder and unreliable.

The purpose of this Part is to define a simple methodology and language for the description of the costing of healthcare facilities.

Disclaimer

Although the quality of design and construction has a major impact on the quality of health care, it is not the only influence. Management practices, staff quality and regulatory framework potentially have a greater impact. Consequently, compliance with these Guidelines can influence but not guarantee good healthcare outcomes.

Compliance with these Guidelines does not imply that the facility will automatically qualify for accreditation. Accreditation is primarily concerned with hospital management and patient care practices, although the design and construction standard of the facility is certainly a consideration.

The Department of Health will endeavour to identify for elimination any design and construction non-compliances through the review of design submissions and through pre-completion building inspections, however, the responsibility for compliance with these Guidelines remains solely with the applicant.

Any design and construction non-compliances identified during or after the approval process, may need to be rectified at the sole discretion of the Department of Health at the expense of the applicant.

Therefore, the Department of Health, its officers and the authors of these Guidelines accept no responsibility for adverse outcomes in Health Facilities even if they are designed or approved under these Guidelines.

These Guidelines are not exhaustive and do not cover every eventuality that may or may not occur in the design, commissioning, operation or decommissioning of the health facility. Where there is conflict between DOH-HFG and existing laws, the latter takes precedence.

Live Documents as published on the DOH-HFG website should always be the only source of reference. Printed / downloaded version could go dated as revisions are published on the website.

Structure of the Guidelines

These Health Facility Guidelines are divided into 8 volumes in order to present information in a comprehensive and logical sequence and avoid unnecessary duplication of information between sections:

Part A	Administrative Provisions • Approval process for Health Facility Licensing • Prequalification of Health Facility Design Consultants • Standards and Guidelines applicable to planning and engineering
Part B	Health Facility Briefing and Planning (this part) • Planning guidelines • Role delineation level • Functional Planning Unit incorporating Description of each Unit • Functional Relationships with diagrams • Schedule of Accommodation for typical units • Standard Components Room Layout Sheets and Room Data Sheets
Part C	Access, Mobility and OH&S • Space standards • Human Engineering • Ergonomic considerations • Accessibility requirements • Signage guidance • Safety and mobility considerations for floors, grab rails, doors, windows
Part D	Infection Prevention and Control • General principles applicable to health facilities • Hand hygiene • Sources of Infection • Isolation Rooms • Surfaces and Finishes • Construction and Renovation
Part E	Engineering – Building Services • Electrical / ELV & ICT • Mechanical (HVAC) • Water Systems • Drainage Systems • Medical Gas Systems

	• Fuel Systems • Pneumatic Tube Systems • Fire Protection Systems (Special Areas Only) • Applicable Standards
Part F	Feasibility Planning and Costing A framework related to Part A licensing and methodology covering • Needs analysis • Risk Analysis • Funding strategies • Procurement strategies
Part G	Acoustics • Architectural Elements • Mechanical Services – Noise and Vibration • Public Health Services – Noise and Vibration • Electrical Services • Lift Specification
Part H (This Part)	Costing • Project Costing • Revenue and Profitability • Options Evaluation • Funding Strategy • Procurement Strategy • Capital Costing Guidelines • Cost Benchmarking Issues

Each part includes relevant guidance and reference material for readers to obtain further information.

1. Terms & Abbreviations

Abbreviations used in this volume include:

Abbreviation	Meaning
FPU	Functional Planning Unit
HRG's	Health Related Groups
ICU	Intensive Care Unit
IRDRG's	International Refined DRG's (IRDRG's)
RDL	Role Delineation Level
SOA	Schedule of Accommodation
SRG's	Service Related Groups

1.1 Background.

In recent years it has become increasingly obvious that some healthcare projects are not properly considered in terms of financial feasibility and provision for correct costing or funding. Some proponents appear to treat healthcare as a real-estate investment business rather than a critical, viable and sustainable service-oriented business.

Some may reason that private healthcare facilities, as businesses, should be allowed to fail; that the health authorities should not be concerned with the viability of private businesses. Others reason that public healthcare facilities are not subject to the profitability concerns of private healthcare and therefore, the health authorities should not be concerned with their feasibility. However, there is strong evidence that the consideration of the sustainability of business both for the private and public sector is in the best public interest.

Proper, methodical costing is an important factor in the preparation of a robust and dependable Feasibility Plan (see Part F) and application for funding.

Public and private healthcare facilities which ultimately prove to be financially or operationally unsustainable and are not realised, resulting in:

- waste money, time and energy
- use the resources of health regulators and licensing agencies
- give a false impression of up-coming future supply in healthcare
- affect the health authority's "capacity planning" due to unreliable supply estimates
- discourage other proponents from entering the market
- create a negative outlook for the healthcare business within financial sectors
- make the funding of new facilities harder
- distort the land-allocation decision-making for healthcare purposes.

In the case of facilities which are built but are found to be not sustainable as a business:

- the dependence of the patients and clinicians on the service facility cannot be maintained
- the quality and safety of operation is reduced to meet costs
- staff numbers and skills tend to be reduced to a minimum at a risk to the patients
- consultants and contractors are not paid or payments are delayed
- services which were indicated in the licensing application are not delivered

1.2 The Purpose of Part H

Part H covers various subjects under costing for healthcare facility. It is a framework for the healthcare industry to consider in conjunction with Feasibility Planning.

Specialists and those experienced in feasibility planning and costing can use their own methodology as long as they can demonstrate that all the relevant and subjects stated in this part are addressed and the correct calculations are applied.

1.3 The Structure of Part H

Part H covers the process of Feasibility Planning and Costing under the following structure:

- Project Costing (Capital and Recurrent)
- Risk Analysis
- Financial Appraisal
- Options Selection
- Funding Strategy
- Procurement Strategy
- Timeframe and Staging
- Feasibility Self-check
- Deliverables

1.4 The terms used in this Part

The “Costing”, both Capital and Recurrent referred to in these Guidelines may already be available for the given project under different titles such as:

- Cost Estimate
- Budget Estimate
- Cost Plan
- Order of Cost
- Priced Bill of Quantities
- Pre-tender Estimate
- Running Cost
- Operational Cost
- Internal Rate of Return
- Cost Benefit Ratio
- Net Present Value.

If such documents are available for the given project, they may well satisfy the requirements of these Guidelines. In such a situation, the minimum requirement of compliance with these Guidelines is to present the conclusions of the Study/Plan/Estimate into the format and terminology proposed in Part H (this Part).

In order to minimise misunderstandings and promote effective communication within the industry, in all applications to the DOH and documents specifically produced for submission to the DOH, only the terms used in these Guidelines should be used. If other documents are supplied in support of the applications to the Authority, the clear meaning of the terms used in said documents under the terms of these Guidelines should be stated in a cover page, cover letter or similar communication.

Many complex issues can be expected in every proposal. These guidelines make no attempt to predict all such circumstances or provide a perfect solution for all conditions. These guidelines are not exhaustive. The key issues and expectations are covered with descriptions which apply to most

facilities. Applicants and users of these guidelines should apply the principles stated or implied in these guidelines to circumstances which are not explicitly covered.

2. Methodology

This section briefly presents the generic methodology for the costing of healthcare facilities.

2.1 Project Costing

Each of the options generated and shortlisted should be costed. The minimum number of options for Private healthcare is 1. The minimum number of options for the Public healthcare is 4. There are several aspects to costing and each should be covered separately:

2.1.1 Capital Cost

Capital Cost represents the total cost of construction including all necessary fees and charges to completion, but not the cost of borrowing, leasing or land. Capital costing for the purpose of compliance with these Guidelines must comply with Appendix 1- Capital Costing Guidelines.

The Capital Costs may be estimated and provided in a number of ways which are acceptable:

- Actual quotation from a Builder
- Estimate by a qualified Quantity Surveyor
- In-house estimate by the Facilities Management or Engineering Department

It is sufficient to present the capital costing in the same format as Appendix 1 or 2.

Alternatively attach the written and signed costing provided by the Builder, the QS or the Facilities Manager/Engineer and then only provide the Cost Summary as per Appendix 1 to this Part (F).

As a minimum, the Capital Cost should cover the following:

- Site establishment and builder's sheds
- Demolition & site work
- New construction
- Refurbishment under 3 categories (Minor Refurb. Medium Refurb and Major Refurb)
- Builders overhead and profit
- Furniture and Fittings, Fixtures and Equipment (FF&FE)
- Professional Fees including Project Management costs
- Authority Charges including application fees, utility contributions and other costs
- Escalation, if any.

The Capital cost should be based on the same project timeline included in the Feasibility Study.

The results of the Capital Costing for each option should be summarised under 4 categories defined in Appendix 1 as follows:

Net Construction Cost	NCC
Gross Construction Cost	GCC
Total Project Cost	TPC
Total End Cost	TEC

For a better understanding of each of the above 4 categories, please refer to Appendix 1.

Note: Under these Guidelines Part A Step 2, only a preliminary Cost Statement is required. This may be a statement based on benchmarks such as Cost per square meter or Cost per bed etc., since at that stage a full design may not be available. The basis and assumptions for this preliminary

cost estimate should be stated. The statement should be included in the Project Synopsis as per the Self Check provided under 4.1 Executive Summary’.

2.1.2 Transition Costs

Transitional costs are one-off costs which are neither part of the Capital costs (as typically quoted by builders) nor a Recurrent Cost. However, they are necessary in order to realise the proposed project. Therefore, they should be part of the budget. Transitional costs include:

Decanting Costs

This involves the decanting (relocation) of existing facilities and services to an alternative location so that the current location can be refurbished, expanded, re-modelled or re-built. The cost of decanting should include the capital cost of temporary modifications, relocation costs, Additional staff costs, cleaning costs etc. It should be noted that some complex projects may require double-decanting before the normal operations are resumed.

Temporary Facilities

This includes facilities which are required during the project execution within existing healthcare campuses such as temporary power generators and water tankers.

Recruitment Costs

This includes the cost of hiring recruitment agents, recruitment staff, training costs and temporary accommodation costs, if any.

Change Management Costs

Some large projects may require a cultural shift from the existing facilities to new facilities. This in-turn may require special provisions to re-train or coach the existing staff using specialists. It may also require one-off changes to software and business systems used, graphics, brochures, telephone numbers, email campaigns, PR, advertising etc. The study should state the transitional costs with a short description for each category of cost.

2.1.3 Opportunity Costs

Opportunity costs may be positive or negative. Negative means income loss and positive means income gain. Opportunity costs include the following:

Income loss

This refers to income which would normally be expected but lost due to the construction activities or the project implementation. This may be short or long term.

Income gain

This may include sale of land, buildings, second hand equipment etc.

Recurrent Costs

Recurrent Cost is also referred to as Running Cost or Operational Cost. It should be prepared in accordance with the categories indicated in this section.

Recurrent Costs should be shown under 2 major categories, HR and G&S Costs as follows:

HR Costs

Human Resource (HR) cost is also referred to as Employment Cost, Workforce Cost or Staff Cost. Initially the HR numbers should be estimated with a minimum level of detailed breakdown as follows:

- Doctors
- Nurses
- Clinical Support/ Para-medical
- Hotel Services

- Site Services
- Administration and Clerical

Under each category the HR numbers should be expressed as Full Time Equivalents (FTE's). A full-time employee is regarded as 1 FTE. An employee of the owner/operator who is assigned to the given healthcare facility 50% of the time is regarded as 0.5 FTE. The purpose of calculating HR via the FTE unit is to avoid double counting.

The FTE's are not confined to staff present at a given time. They include all staff numbers including all shifts in a 24-hour period. They also include staff employed but not present due to leave, training and relief. In short, the total FTE represents the full time equivalent staff that need to be employed and paid in order to run the facility regardless of whether or not they are actually present on the premises at a given time.

As a minimum the HR FTE's should be stated for the present condition (if any) and the first year of operation for the project components (which are the subject the Feasibility Study). For complex multi-stage projects, FTE's should be provided for each year when a major new component of the project is commissioned.

In some of those years, partial opening of certain components may be intended. If so, the percentage completion or occupancy percentage should be stated, then the FTE's should be adjusted to represent the required HR for that level of partial opening.

HR costing involves applying an average annual salary rate to each of the employment categories above. The additional on-costs or staff benefits such as training costs, relief, holidays, insurance contribution etc. may be added to the salary rates or added at the end of the calculations. The HR costs should then be simply summarised for each employment category and totalled.

G&S Costs

Goods and Services costs (G&S) represent the balance of the recurrent costs other than HR costs. G&S costs should be provided in summary form with a minimum breakdown as follows:

- Administration
- Domestic Supplies and Services
- Drugs
- Equipment Leasing
- Food Supplies
- Medical & Surgical Supplies
- Motor Vehicle Expenses / Travel
- Other Goods and Services
- Patient Transport (including ambulance)
- Rental Accommodation
- Repairs Maintenance and Renewals
- Support & Special Services
- Utilities
- Insurance and Legal Costs
- Other

As a minimum the G&S should be stated for the present condition (if any) and the first year of operation. For complex multi-stage projects, G&S should be provided for each year when a major new component of the project is commissioned.

Note: Healthcare facilities typically involve a cycle of renewals which may involve internal or external painting, replacement of equipment, major repairs, and change of carpet or vinyl. The typical cycle is around 7 years. The G&S estimates should include a portion of the budget set aside for these under the category of "Repairs, Maintenance, and Renewals". This effectively means that the funds are set

aside (or accounted) every year until they are needed in year 7. The allocation of a budget for such periodical renewals is necessary for the safe and sustainable delivery of healthcare services.

2.1.4 Total Recurrent Costs

The HR costs and G&S costs should be totalled for each year of the study. As a minimum this should include the present year (if facilities exist) and the first year of full operation after the completion of the project.

2.1.5 Life Cycle Cost

Should the client or the DOH as the operator of public hospitals require it explicitly in writing, provide a full Life Cycle Cost. This will involve all the recurrent costs including HR and G&S stated for the present year (if any) as well as a minimum of 10 years into the future from the date of project completion.

The annual costs should also incorporate the periodical renewals (typically every 7 years).

Then the Net Present Value (NPV) for this period should be calculated for each option and presented as a summary.

2.2 Revenue and Profitability

2.2.1 Revenue

In order to evaluate the feasibility of the proposed project (and its options), the proponents should calculate the expected revenue.

The revenue may be a combination of:

- Insurance payments
- Direct patient payments
- Tenancy leases
- Charity grants
- Government funding (in the case of public facilities)

The proponents should estimate the revenue whilst stating their own assumptions.

The methodologies used for revenue calculation vary considerably but may include;

- Direct calculations based on the expected throughput and rates of payment
- Benchmark against other existing operations
- Project the past revenue into the future and update for any increased volume

2.2.2 Profitability

It is not mandatory for private or public healthcare facilities to be profitable or cash-positive upon commencement. It is common for new facilities to require some time (2 to 4 years) to reach profitability. However, it is necessary to demonstrate a strategy to reach a break-even point over a predictable period of time. Without such a strategy, it should be assumed that the feasibility of the project has not been established or considered.

In the case of private facilities, the degree of profitability beyond the break-even point is a matter for the investors to determine, require or approve. In the case of public facilities, the study must demonstrate the break-even point based on the expected or requested budget in order to allow the decision-makers to evaluate the project in an informed manner.

To summarise, it is sufficient to compare the stated costs with the expected revenue and provide a clear statement in relation to profitability or break-even timing.

2.3 Options Evaluation

The process of Options Evaluation is necessary in order to select one option out of many.

The minimum requirement of these Guidelines is one option for Private Facilities and 4 options for Public facilities.

Even for one option, the evaluation process should be conducted and recorded.

Based on the key elements of the feasibility study as stated above, the proponents should develop a number of evaluation criteria. These should normally focus on service improvements, value for money, patient satisfaction and long-term business sustainability.

To keep the evaluation focussed and understandable, the evaluation criteria should be grouped into 5-10 categories. The options evaluation matrix should summarise and tabulate the following:

- Short descriptions of options 1 to 4
- Summary of KPU's e.g. bed numbers, operating room numbers, etc.
- Summary of SOA or simply the Gross Floor Area
- Cost summaries including Capital Cost, Recurrent Cost, Transition Costs, Opportunity Costs, Life Cycle Costs
- Revenue and Profitability
- Short general remarks in relation to the options in the context of the Investment Objectives
- Short remarks under each of the evaluation criteria
- Short discussion of the expected risks and risk mitigation strategies

2.3.1 Options Selection

The above tabulated options evaluation should follow with free-form reasoning to conclude that one option is preferred. It is not necessary for the reasoning to be convincing to all readers, but the main point is to demonstrate that there has been a thought process and the issues have been recognised and considered, rather than overlooked.

2.3.2 Financial Appraisal

Should the DOH find the costs or assumptions submitted as part of the deliverables of this Part (F) unconvincing, then the proponents (public or private) may be required to subject their proposals to an independent Financial Appraisal. If requested explicitly and in writing by the DOH, a reputable Financial Consultant with experience in Healthcare should be engaged and supplied with a copy of the Feasibility Study and Costing. The Financial Consultant may then request additional information or proof of certain assumptions. Then the result of the independent review by the Financial Consultant should be submitted for a further review. In the case of public facilities DOH may choose to appoint a Financial Consultant directly without reference to the Applicant.

2.4 Funding Strategy

Assuming that up to this point the results of the Feasibility Study and Costing are convincing and promising, there is a need to demonstrate the capacity to fund the project.

2.4.1 Capacity to Fund

The capacity for funding can be demonstrated in a number of ways:

- Statement of financial capacity to fund the project directly
- Statement from a reputable Bank to indicate that the proponents have the capacity to borrow sufficient funds for the project
- Statement from investors indicating that collectively they wish to invest the necessary funds in the project
- Statement from the Financial Controller stating that funding has been set aside from the overall organisational cash reserves (or in the case of public projects) from the promised Capital funds in order to implement the project
- In the case of public projects if the funding is subject to approval after the submission of the Feasibility Study and Costing, a statement to that effect should be provided.

All the above statements should be in writing, indicating that the Author(s) have seen the Feasibility Study and Costing.

2.5 Procurement Strategy

The procurement strategy is a synopsis of the method of delivery intended at the time of the preparation of the Feasibility Study. The strategy may well change at a later stage and depending on commercial circumstances. However, it is important to demonstrate at least one rational and convincing procurement strategy incorporating the following:

2.5.1 Timeframe and Staging

Provide a simple summary of the timeframe for the project. A Gant chart is preferred with key links between the activities including:

- Project Commencement
- Completion of the Sub-structure
- Completion of the Super-structure
- Completion of internal Fitout
- Equipment commissioning
- Practical Completion
- Hand-over

In the case of multi-stage projects where certain components are completed and occupied whilst other components are being completed, provide the above timeframe for each of the stages.

2.5.2 Contract Type

Make a statement in relation to the type of contracting to be used for the execution of the project. This may include but not be limited to:

- Open lump sum tender (or Prime Contract)
- Invited lump sum tender
- Design & Build (D&B)
- Design Develop and Construct (DD&C)
- Construction Management
- Managing Contractor (or Cost +)
- Direct Contract (or owner-build)
- Public Private Partnership (PPP)
- Turnkey
- BOOT

3. Appendix 1 – Capital Costing Guidelines

This section provides additional methodology and defines the terminology for Capital Costing.

3.1 Capital Costing; Definitions and Methodology

3.1.1 Net Construction Cost or (NCC)

Net Construction Cost is composed of the following:

Departmental (FPU) Costs

These represent the Net Internal Construction cost of each Functional Planning Unit (FPU) otherwise referred to as Departments. The cost per M2 varies for each FPU depending on the level of complexity, density of fitout, level of building services, typical types of finishes etc. Furthermore, the FPU rates are linked to the Role Delineation Level (the level of service being provided) or (RDL), so the cost of the same FPU varies from one RDL to another. A higher RDL is more expensive than a lower RDL.

The FPU rates are applied to Gross areas including the circulation space within each department. The area measurement method is known as the No-Gap method. In this method, the Gross departmental (FPU) area is the simple sum of the individual rooms plus the internal circulation corridors but not Travel and Engineering space.

The room areas are measured as follows:

- To the inside face of outside walls
- To the centre of side walls
- To the outside face of circulation corridors
- Circulation corridors are measured to the face of the walls.

For a better understanding of the measuring method, refer to Part B of these guidelines where clear diagrams of the no-gap measuring method are provided.

Departmental (FPU) Gross areas can be estimated early in the project on the basis of the Briefing Information and Schedules of Accommodation (SOA). Later in the project these can be measured off the plans and compared with the briefing estimates. A variance of more than a few m2 per department would normally be unacceptable in a new building design but tolerable in refurbishment projects.

A special note must be made in relation to “Shell Space”. Some projects include shell space for future internal expansion. This is based on the theory that building shell space for the future now is cheaper than building it in the future. This conclusion is not universally accepted. There should be no automatic assumption that for public or private facilities it is necessary to provide shell spaces for the future. However, if this is the intention, they should be identified and correctly costed.

Travel and Engineering (T&E) Costs

Travel refers to the major corridor links between the Departments (or FPU's). These are measured to the face of the walls.

Travel also includes Stairs (measured once per floor), Lift lobbies, and internal Ramps but not voids such as lift voids.

Engineering refers to plant rooms, service cupboards, service tunnels etc. Holes in the slabs for risers are not counted.

T&E may be estimated as a percentage of the Gross Areas or measured off the plan depending on the stage of project (before design or after design). If T&E is estimated at briefing time, it is entered as a percentage, separate to FPU areas. If T&E is measured off the plans, it is entered separately as Travel FPU and Engineering FPU. Then the T&E % is entered as 0.

Building Shell and Site Conditions

Each building or building type is designed to an Architectural shell with certain external features responding to the site and design preferences including materials finishes. The Departmental rates cover all the internal costs for the building(s). The “Building Shell and Site Conditions” will estimate the balance of the cost including the following:

- Bulk Earthworks
- Fire Compartmentation
- Demolition Works
- External Works
- Façade
- Infrastructure Services
- Landscaping
- Roof
- Site Preparation
- Special Provisions
- Sub Structure
- Super Structure
- Transportation Services
- Civil Works
- Outbuildings.

The assumptions for each of the above vary from one project to the next. So, unlike the FPU costs, the above costs must be site-specific. However, for many components of the above categories, it is possible to develop benchmarks which are applied to similar facilities. For example, the Façade system or Super Structure in one project may be very similar to another. So, it is possible to simply quote the cost from a recently tendered project, identifying those elements.

Project Specific Costs

A number of project costs are regarded as on-off costs and cannot be estimated based on formulas applied to variables of the project. These costs are entered as cash estimates.

These may include:

- Mains upgrade
- New generators
- Contribution to road extensions or repairs
- Cash already spent towards the project.

FF & FE Costs

Normally the cost of Furniture, Fittings, Fixtures and Equipment (FF&FE) sometimes referred to as FF&E would be estimated separately based on generic equipment lists and the room types present in the brief or design. However, on occasions where such an equipment list does not exist, FF&FE are entered as a percentage of building cost.

3.1.2 Gross Construction Cost (GCC)

Gross Construction Cost (GCC) is composed of NCC plus the following “Contract Costs”:

Each procurement contract type has different on-costs which should be applied. These on-costs can be calculated as follows:

Table of on-costs included in GCC based on the intended contract type

1	Net Construction Cost (NCC)	% applied to NCC	Applied to	Cost
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2	Preliminaries Cost (1)	e.g. 10%	1	\$ cost
3	Contractors Margin	e.g. 10%	1+2	\$ cost
4	Design Contingency	e.g. 5%	1+2+3	\$ cost
5	Locality Factor (2)	e.g. 0%	1+2+3+4	\$ cost
6	Risk Factor	e.g. 5%	1+2+3+4+5	\$ cost
7	Project Agreement (3)	e.g. 0%	1+2+3+4+5+6	\$ cost
	Subtotal of on-costs			\$ subtotal cost

Notes:

- 1 Preliminaries include site establishment and direct labour by the builder
- 2 Locality Factor is the cost difference for the same facility if built in a Capital City vs a regional or remote city with special circumstances. Costs are benchmarked to the nearest capital city, then for each other city a Regional Factor is applied to compensate for the difference in costs. Therefore, when costs are done for a Capital City, the regional factor is 0. When costs are done for other cities, the regional factor is a positive or negative % of NCC.
- 3 Project Agreement refers to any special contractual agreement for labour penalties for harsh conditions, extra hours or similar

Please note the order of calculations shown in the above table. Changing the order will change the results. In order to maintain a central benchmark for costing, these Guidelines require the above order of calculations to be maintained.

The typical contract costs which vary the above on-costs are:

- Prime Contractor
- D&B (Design and Build) also called Design-Construct
- DD&C (Design Develop and Construct)
- Managing Contractor (or Cost +)
- Public Private Partnership (PPP)
- Construction Management
- Direct Contract (or owner-build)
- Other contract types

One of the above generic contract descriptions needs to be selected or assumed in order to arrive at the benchmark percentages. It should also be noted that the benchmark percentages are those achieved over many projects and many years as measured at the end of the project. Initial optimistically low percentages inserted into various contracts are not a good benchmark to use as the impact of variations during the contract must be considered and allowed.

The above benchmarks are usually available to clients and Quantity Surveyors experienced in healthcare projects.

3.1.3 Total Project Cost (TPC)

Total Project Cost (TPC) is composed of the GCC plus the following:

Fees, Charges and Contingencies- These are the balance of the on-costs mentioned above under GCC. The on-costs which are included in the TPC are as follows:

Table of on-costs included in the TPC

		% applied to NCC	Applied to	Cost
8	Construction Contingency	e.g. 5%	1+2+3+4+5+6+7	\$ cost
9	Consultants Fees	e.g. 12%	1+2+3+4+5+6+7+8	\$ cost
10	Authority Charges	e.g. 2%	1+2+3+4+5+6+7	\$ cost
11	Other Charges	e.g. 0%	1+2+3+4+5+6+7	\$ cost

	Subtotal of on-costs			\$ subtotal cost
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The reason these are included in the TPC and not GCC is that on many projects these costs are separated and paid by the Client. So, it is beneficial to separately note these costs.

Project FF&FE Costs– This refers to the cost of Furniture, Fittings, Fixtures and Equipment. The default costing methodology is to estimate these based on briefing information such as Room Data Sheets. If, however, these are not available, they can be entered directly as Project-Specific Costs.

The FF&FE procurement costs are in 6 default categories:

- Group 1- Supplied and Installed by the builder
- Group 2- Supplied by the client and installed by the builder
- Group 3- Supplied and installed by the Client
- Group 1T- Existing items transferred and Installed by the builder
- Group 2T- Existing items supplied by the client and installed by the builder
- Group 3T- Existing items supplied and installed by the Client.

Even if there is no intention to procure the FF&FE according to the above groups, it is beneficial to separate them as such for benchmarking purposes. Obviously, items which are supplied and/or installed by the client will not attract a builder's margin. However, the builder is required to make allowances for the building to accommodate and serve them.

3.1.4 Total End Cost (TEC)

The Total End Cost (TEC) is composed of the TPC plus the following:

Escalation

This represents the rise in costs between the time the estimate is prepared and the end of the project when the final payment is made to the builder.

This does not assume that the building contract allows for rise and fall. This is simply a component of cost estimation which will vary from one locality to the next and should be separated for benchmarking purposes. It should in fact be assumed that the TEC is the contracted price.

Escalation is based on several factors:

- Estimate Date: This is the date the estimate is prepared
- Project Commencement: This is the date of the construction commencement
- Project Completion: This is the date of construction completion
- Escalation rate: This is the rate of escalation per annum.

Escalation is calculated as follows:

- A = The rate of escalation is applied fully to the TPC for the period between the Estimate Date and Project Commencement
- B = The rate of escalation is applied to the escalated cost (including A) for the period between the Construction Commencement and mid-point of construction. This allows for an assumed expenditure curve from the beginning of the construction to the end.
- C = A+B is the total project escalation between the Estimate Date and Project Completion

Escalation rate can be expressed in two methods. Both methods can be used for escalation calculation, although method 2 is generally regarded as more accurate. It is usually provided by industry bodies, Municipalities or Governments. When it is not available, then Method 1 is used.

These are described as follows:

Method 1- Escalation % per annum. This is a percentage estimated by quantity surveyors.

Method 2- Building Price Index (BPI). BPI is expressed by numbers which are estimated for the current as well as future years. The difference between the numbers represents the escalation factor.

3.1.5 Cost Summary

The above 4 major categories of Cost need to be summarised and presented similar to the following:

1	NCC	\$ cost
2	GCC	\$ cost
3	TPC	\$ cost
4	TEC	\$ cost

3.1.6 Warning

As the logic of the costing methodology described above would indicate, there are many factors which result in the Total End Cost (TEC), the cost that really matters.

Therefore, it is inappropriate to take the end result of this type of costing and convert it into a lower level benchmark such as a simple Cost per Square Meter, or worse, a Cost per Bed. These types of low-level cost benchmarks are misguided and inaccurate. We strongly caution against their use, even though they may be convenient in daily conversation. It can be demonstrated that their use actually results in bad decisions and outcomes.

3.2 Cost Benchmarking Issues

This section is not part of the Guidelines, but provides an overview of some of the observed issues in cost benchmarking between projects.

Benchmarking generally refers to an estimate of cost for a project in comparison with other, similar projects or project types. This is usually intended for the verification of costs so that when problems are discovered corrective action may be taken in the future.

An important factor which should be considered in costing is that high-cost building environments tend to justify and reinforce these costs through the entire eco-system of the construction industry. Once, for any reason a City, Country or Industry falls into a pattern of initial high construction costs, cost escalation during construction or unreliable cost estimates then the following will most likely follow:

For new projects clients employ cost consultants (QS's) to estimate the market cost to within an acceptable margin of accuracy (plus/minus 5%).

- Cost Consultants look at historic, current and future patterns in that City, Country or Industry and give an estimate. This may be an accurate Market estimate, but it may not be a fair Price.
- This process does not discover why in certain areas, costs are unusually high.

So, in environments where there are numerous changes to the projects during the construction, the client or head contractors do not pay on-time, designers do not provide adequate detailed information and there is no early signed-off for the project brief, each party within the construction echo-system will add its own contingency. Then each cost consultant advising the various parties anticipates this and allows for the prevailing high market rate. The client's QS does the same, otherwise both the tenders and end project costs will prove him wrong and unreliable.

So, the client gets advice in relation to the costs which, not surprisingly confirms the current high cost environment. So, if a new project is judged by such a benchmark, its high costs appear justifiable, even when in reality they are not.

In order to discover this phenomenon and quantify it, various benchmarking techniques can be used to by-pass the above feedback loop. The results, if lower than the current cost environment, may not be immediately achievable, but they will hopefully highlight the problem to be addressed.