# PROFESSIONAL STANDARDS FOR QUANTITY SURVEYING & COST ENGINEERING – GLOBAL ISSUES & STRATEGIES

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## ABSTRACT

This paper provides an overview of the various professional standards that have been developed for the Quantity Surveying and Cost Engineering professions by various countries and professional associations around the world. It then examines the issues surrounding the lack of global standards for these professions and explores the benefits of developing over-arching strategies to produce global standards. The paper culminates with examples of current initiatives to develop such standards. The research methodology underpinning this study comprises a literature review and analysis of professional standards. The research results reveal a wide variety of professional standards despite the fact that the fundamental principles and procedures of quantity surveying and cost engineering practices are the same throughout the world. The study will describe current initiatives to develop global standards and will provide a case example of the proposed development of an International Construction Measurement Standard (ICMS). The paper concludes with a range of recommendations and strategies to help address these issues.

**Keywords:** Professional Standards, Certification, Quantity Surveying.

## INTRODUCTION

The Quantity Surveying and Cost Engineering professions have developed a range of national and regional professional standards over many years. However, the professions lack over-arching global standards that have been typically been developed for most other professional disciplines in the construction industry such as Architecture, Engineering and Project Management. On a broader scale, most major professional disciplines have global standards (accounting, business and the like).

The lack of global standards inhibits the development and identity of the Quantity Surveying and Cost Engineering professions on a global scale. Given the increasingly global nature of construction activity with an increasing number of contracting and consulting firms and developers operating in multiple countries this problem continues to build.

This paper will provide an overview of the main standards and certification/registration programs that have been developed around the world. It will identify the non-existence of global standards/programs and will then look at current initiatives and strategies to address this problem.

## MEASUREMENT STANDARDS

The most common standards developed for the Quantity Surveying profession are Standard Methods of Measurement for building work. Standard methods or measurement are also commonly prepared in many countries for civil engineering works.

Quantity Surveyors generally adopt a Standard Method of Measurement that has been developed for their particular country, region or market sector. These standards are commonly adapted by Quantity Surveyors to suit their particular measurement approaches and or client/market requirements. An example is the adaptation of a standard method of measurement to a more concise/abbreviated form.

However, the Cost Engineering approach generally allows contractors to base their estimate on their individual methods of measurement and pricing – this often forms a distinct competitive advantage for contractors when bidding on projects. Whilst standard methods of measurement are used by many cost engineers they are not as widely used compared to the quantity surveying profession.

The first Standard Method of Measurement (SMM) of building works dates back to 1922. This was prepared by the Royal Institution of Chartered Surveyors (RICS) in the United Kingdom. The RICS have subsequently developed numerous versions of this standard. The RICS standards have been widely adopted by the quantity profession in Commonwealth countries. Mills et al. (2006) found that the RICS SMMs are the most widely used around the world for the building sector.

Nani et al. (2008) reported on research that has shown that the use of SMMs is widespread. A global survey by the Building Cost Information Service (BCIS) identified 32 different SMMs in various countries (RICS 2003) while Mills et al. (2006) identified 44 SMMs used in 32 countries. This research also found that many SMMs are amended versions of the RICS SMMs.

The RICS have recently undertaken a major overhaul of their most recent version (SMM7) to address contemporary measurement issues. The following provides a description of this initiative (RICS 2013). A measurement initiative steering group was set up by the RICS to research the problems associated with the measurement of building works at all stages of the design and construction process. The steering group found that significant improvements where required and this led to the development of a suite of documents covering all aspects of the measurement and description of a building project – called the RICS new rules of measurement (NRM).

The NRM is a suite of documents issued by the RICS Quantity Surveying and Construction Professional Group. The rules have been written to provide a standard set of measurement rules that are understandable by anyone involved in a construction project. The rules provide essential guidance to all those involved in, as well as those who wish to be better informed about, the cost management of construction projects. Although the RICS new rules of measurement are principally based on UK practice, the requirements for a coordinated set of rules and underlying philosophy behind each volume have worldwide application. The specific methods are:

NRM 1: Order of cost estimating and cost planning for capital building works

NRM 2: Detailed measurement for building works
NRM 3: Order of cost estimating and cost planning for building maintenance works (RICS 2013)

There have also been measurement standards developed on a regional basis. This includes a European Code of Measure developed by the European Council of Construction Economists (CEEC 2015) and the Africa Standard Method of Measuring Building Work developed by the Africa Association of Quantity Surveyors (AAQS 2015).

The Association for the Advancement of Cost Engineering International (AACE) have developed a Total Cost Management Framework (TCM) that is being increasingly used in many countries. The AACE are based in the United States but have sections in many countries around the world. Whilst not strictly a measurement standard it provides a standard for the whole cost management process.

Examples of other common measurement standards include:

Hong Kong Architectural Services Department- Standard Method Of Measurement For Building Elements (2001)
Hong Kong Standard Method of Measurement for Civil Engineering Works, (1992)
UK Institution of Civil Engineers - CESMM4 Civil Engineering Standard Method of Measurement (2012)
New Zealand Standard NZS 4202:1995 – Standard method of measurement of building works
Australian standard method of measurement of building works. - 5th ed., AIQS (rev 2012

## COMPETENCY STANDARDS AND BEST PRACTICES

A variety of competency standards and practices have been developed for the project cost management profession in various countries around the world. Nalewaik & Bennett (2012) undertook an analysis of the main competency standards and best practice guides that have been developed. The following provides a list of the main standards and guides that were found:

### International

International Project Management Association (2006) - IPMA Competence Baseline Version

### United States

AACE International (2006) - Recommended Practice 11R-88: Required Skills and Knowledge of a Cost Engineer
AACE International (2007) - Skills & Knowledge of Cost Engineering
American Society for the Advancement of Project Management (2008) - USA National Competence Baseline v2.0.

**United Kingdom**

The Association of Cost Engineers (2004) - National Occupational Standards for Building Control
The Association of Cost Engineers. (2006). National Occupational Standards for Project Control Support
Chartered Institution of Civil Engineering Surveyors (2011) - Commercial Management Competencies - Project Management.
Chartered Institution of Civil Engineering Surveyors (2011) - Technical Member Competencies - Cost Engineering.
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**Australia**

The Australian Institute of Quantity Surveyors (1997). National Competency Standards for Quantity Surveyors – Construction Economists.

Global Alliance for Project Performance Standards (2007). A Framework for Performance Based Competency Standards for Global Level 1 and 2 Project Managers.

Australian Institute of Project Management (2010) - Professional Competency Standards for Project Management - Part C (CPPM)

**South Africa**

The South African Council for the Quantity Surveying Profession. (2013). SACQSP Skills Modules.

**Asia-Pacific**

Pacific Association of Quantity Surveyors - (2001) - Competency Standards for Quantity Surveyors in the Asia-Pacific Region.

All of these competency standards and guidelines provide a strong foundation for the potential development of global competency standards.

## GENERAL STRATEGIES FOR DEVELOPMENT

### Global Professional Standards

The profession needs to develop common global standards, common bodies of knowledge and standard definitions/terminology. These standards could provide an over-arching platform that could then be adapted to suit local and regional requirements. Large global entities typically require International Standards, International Certification and International Accreditation. Excellent standards

already exist in many parts of the world (such as the AACE Total Cost Management Framework and the PAQS Competency Standards). These could form the foundation for the development of global standards.

However a major challenge is developing global standard that incorporate the different approaches used by quantity surveyors and cost engineers. This may require minimum standards that can then be adapted to suit the particular requirements in various countries, regions and market sectors.

### ISO Cost Management Standard

A global ISO Cost Management Standard would provide significant recognition for the profession and would provide the basis for institutionalising the benchmarks for the profession based on mutually recognised international standards and best practices. The global project management community embarked on the development of an ISO Project Management Standard in 2007 and the ISO 21500:2012 Guidance on Project Management was finally published in September 2012. The process is not simple as demonstrated by the 5 years of development and this is only the first stage in developing a suite of portfolio, program and project management standards. A new ISO technical committee TC258 has been established to develop a functional set of integrated standards to improve project management on a global scale (Weaver 2012).

The Quantity Surveying and Cost Engineering professions have much to learn from this project management standard.

## CURRENT STRATEGY FOR DEVELOPMENT

### International Construction Measurement Standard (ICMS)

The International Cost Engineering Council (ICEC), the RICS, the European Council of Construction Economists (CEEC) and other professional associations are in the early stages of discussion for the development of a global International Construction Measurement Standard (ICMS). The purpose is to develop international standards through input and ownership by professional cost management associations around the world that are recognized by world bodies and national governments.

Construction is an increasingly globally mobile industry, where investments in, and the implementation of, projects is carried out on an international basis. At a macro level, there is no consistent way to measure construction activity in national accounts. For example, the United Nations produces a list of standard activities for construction (the International Standard Industrial Classification - ISIC). The categories, however, are not complete and there is a need to revise them to reflect modern needs and practice. Government statistical agencies and industry commentators require improvements in the official definitions of construction and the way data is presented.

Definitions and measurement of construction activity and cost vary widely. This is not only a concern in global and national accounting, but also on the demand (investment) and supply (consultants and contractors) side of the industry. This lack of comparability and consistency affects certainty, and therefore investment in, construction.

At a micro level, surveys of construction cost managers carried out by the RICS and the CEEC have shown that:

- approximately 50% of 40 countries responding did not claim any published standard elemental classification of building parts
- in the absence of locally agreed standards, professionals frequently adopt 'foreign' standards or ad hoc in-house developed standards;
- there is no common way of expressing cost per m2, both in terms of the cost definition and the floor area, and
- there are many countries where the quality of cost information, and data classification, falls short of what local professionals might wish. (Muse 2015)

Data is recognized as the fourth factor of production (Ong 2012). It is therefore necessary that data is measured, collected, managed and harnessed in a way that maximizes the efficiency of production. International construction measurement standards (ICMS) may offer the greatest benefit by increasing the quality of comparable data used to inform decisions on international expenditure, production and investment. In an increasingly global market investors search for, and have exposure to greater opportunities for international investment in construction development projects.

Investors are often faced with limited capital funds, or the capacity to invest in only one project on a given site meaning that projects are 'mutually exclusive'. Where only one project may be chosen as an investment vehicle, it is essential to choose the project whose value exceeds the cost of inputs used by the greatest amount. This decision making process requires investment options (in this case development projects) to be measured, scored, and ranked (Harvey & Jowsey 2006).

From a purely monetary perspective, an investor's decision-making around scoring, ranking and selecting a particular investment project, will be broadly based around the following considerations:

a) The cost of land
b) Construction costs
c) Other development costs (fees, statutory and legislative costs etc.)
d) Developer's profit
e) Value of the completed development

The relationship between these considerations may be considered as follows:
a + b + c + d = e

This paper is concerned only with item b) Construction costs, which may typically account for 30% – 40% of e) the value of the completed development.

At a regional level, i.e. where investors are ranking and appraising investment options all within one region, the data used for ranking may or may not be measured to a consistent standard. However, it's likely that the data may at least be comparable within any given region. By making reasonable assumptions based on knowledge of

the regional market, then leveling and manipulating the data a meaningful comparison can be made to inform decision making.

For example, a Quantity Surveyor may be commissioned to appraise the construction costs of a number of investment options on behalf of a client. When making an appraisal, a surveyor would need to consider aspects that include but may not be limited to the following:

- Technical design (structure, services, finishes)
- Specification (quality and performance of materials, finishes, equipment)
- Contractor's preliminaries
- Design efficiency (net to gross area ratio, wall to floor ratio)
- Construction start date and duration
- Design and management fees
- Legislative and statutory matters
- Construction methodologies available
- Construction technologies available
- Location factors
- Risk

The Quantity Surveyor may use historic data, forecasts and judgment to make assumptions that will enable a meaningful comparison of the various schemes. In regions that have nationally agreed standards, or recognized practices for measuring construction costs each of the factors listed above could be measured on a comparable basis.

The CEEC has done considerable work on measurement standards in Europe. By comparing the various measurement standards of a number of European nations on a single, common design scheme, the CEEC has highlighted the discrepancy in the resulting costs generated by using the various standards that are available. The results found a cost variance of almost 100%. This significant discrepancy was the result of the various definitions of the measurement of quantities within each standard, however it was also found that different national standards either included or excluded various scope items within the standard.

For example, depending on the country, the following costs were included:

- Building construction and external works (all countries)
- Professional fees for planning (all countries except France)
- Land costs (only Switzerland and Denmark)
- The cost of finance (only Switzerland and Denmark)

The resulting comparison of costs /m2 were therefore highly misleading (Wright & Stoy 2008) and as such would potentially lead to investment decisions being taken on substantially inaccurate data regarding the construction costs of a development.

At a global level, there is no single standard of measurement for construction. Based on the work by CEEC across Europe, it can be argued that a similar situation most likely exists where inconsistent data leads to significant variations in the reporting of construction costs between world regions. This inconsistency of data creates

challenges to the investor who needs to make choices between international investment options. Specifically, the status quo is that when comparing development projects between different countries, there is no international standard that defines what is included within a construction cost estimate, making cost comparisons inefficient and/or inaccurate. At best, the investor can make reasonable assumptions to make construction investment options more comparable to make informed decisions. At worst, decisions are based on poor quality information and may lead to significant losses for governments, businesses, institutions and/or investors.

The RICS, CEEC and ICEC are currently working on the development of a proposal whereby globally collaborative standards in construction cost definition and measurement are agreed through a coalition of relevant international professional bodies.

While the aim is that the precise scope and detail of the standard will be agreed by the coalition, the proposed objectives and outcomes will be to address the challenges described above. Standard, internationally recognised, cost definitions will also assist in data classification, analysis and subsequent prediction and particularly as BIM develops worldwide.

It is also proposed that Non-Government Organisations (NGOs), industry and businesses will be engaged in this process so that endorsement and recognition is achieved if the standard is developed and published. Communication and dissemination of the standard in local jurisdictions will be carried out by the relevant coalition partners to embed global best practice and enhance and integrate the cost management profession worldwide.

## CONCLUSION

Whilst the Quantity Surveying and Cost Engineering professions lack global standards in a range of areas it could be argued that the most scope for developing such a standard lies in the fundamental core competency area of the professions - measurement.

The international construction measurement standard proposal could provide the catalyst for the development of a range of global standards for the profession. The measurement standard itself may require the development of a suite of standards to address different types of industry sectors (building works and civil works) and different measurement stages (conceptual estimates, cost plans, estimates, life cycle costs and the like). The challenge is to develop a global standard that incorporates aspects of both Quantity Surveying and Cost Engineering approaches – possibly a minimum standard that can then be adapted to suit the particular requirements in various countries, regions and market sectors.

More broadly, the Quantity Surveying and Cost Engineering professions need to develop common global standards, common bodies of knowledge and standard definitions/terminology. These standards could also provide an over-arching platform that could then be adapted to suit local and regional requirements.

Ultimately, this would provide tremendous potential to unite the cost professions and help develop a global professional identity similar to that enjoyed by Architects, Engineers and Project Managers in the industry.

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