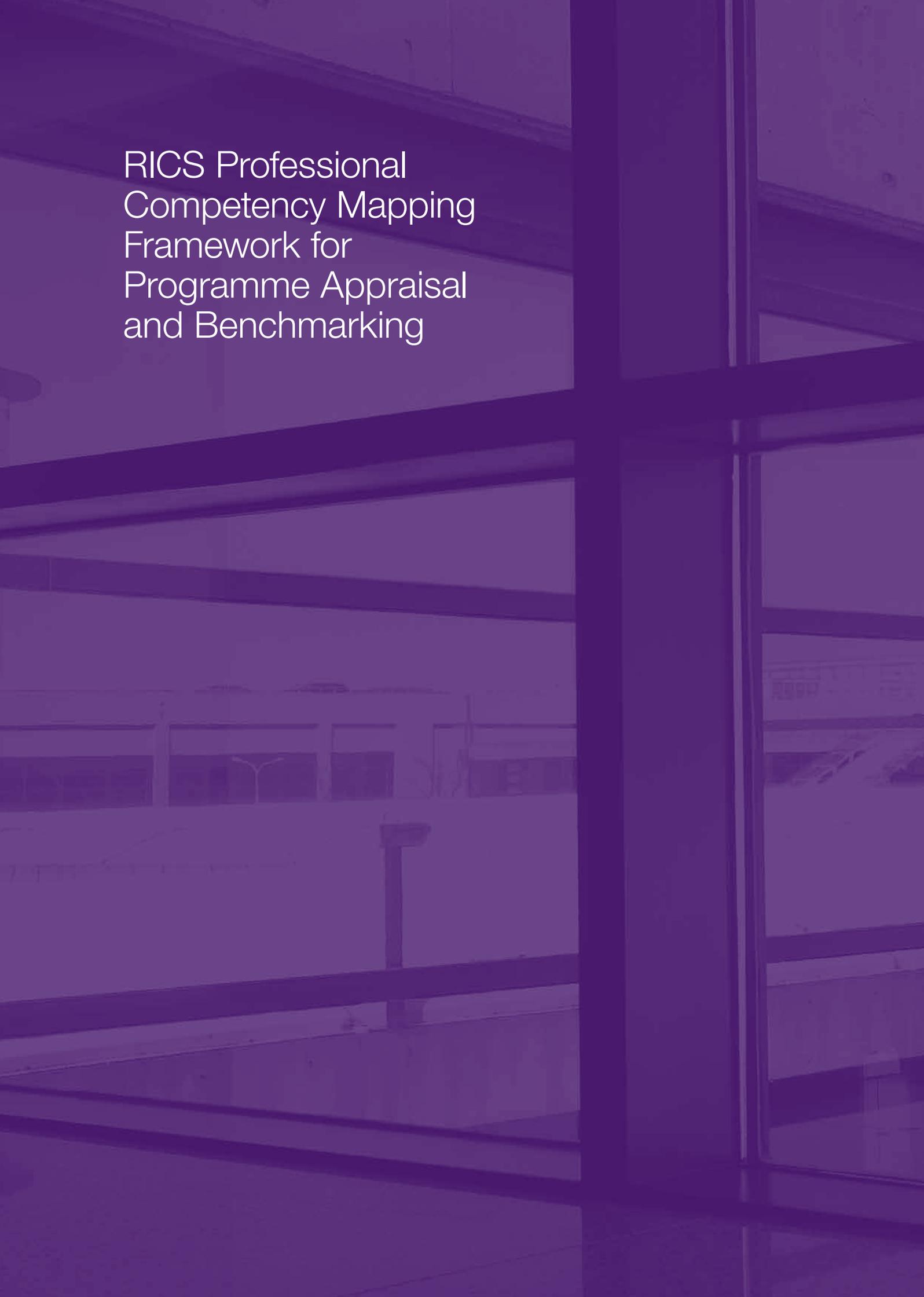


# **RICS** Research

RICS Professional Competency  
Mapping Framework for Programme  
Appraisal and Benchmarking





RICS Professional  
Competency Mapping  
Framework for  
Programme Appraisal  
and Benchmarking

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## A report for Royal Institution of Chartered Surveyors

Report written by:

**Prof. Srinath Perera MRICS**

srinath.perera@northumbria.ac.uk

Northumbria University, Newcastle upon Tyne, UK

**Mr John Pearson FRICS**

john.pearson@northumbria.ac.uk

Northumbria University, Newcastle upon Tyne, UK

Research team:

**Dr Lei Zhou and Damilola Ekundayo**

Northumbria University, Newcastle upon Tyne, UK

## RICS Research team

**Dr. Clare Eriksson FRICS**

Director of Global Research & Policy

ceriksson@rics.org

**James Rowlands**

Global Research & Policy Project Manager

jrowlands@rics.org

**Amanprit Johal**

Global Research & Policy Project Officer

ajohal@rics.org

Published by:

RICS, Parliament Square, London SW1P 3AD  
United Kingdom

[rics.org/research](http://rics.org/research)

Contents .....	04
List of Abbreviations.....	06
Foreword.....	07
<b>Part 1 Executive Summary.....</b>	<b>08</b>
Background .....	09
Research Method.....	09
Competency Mapping Framework (CMF).....	10
RICS QS Competencies .....	10
Competency Mapping Scoring System.....	10
Development Process of the GCTB.....	10
Analysis of the GCTB .....	11
Incorporating and using CMF .....	13
Conclusions and Recommendations.....	13
<b>Part 2 Main Report .....</b>	<b>14</b>
<b>1.0 Introduction .....</b>	<b>15</b>
1.1 Background .....	15
1.2 Aim & Objectives.....	16
<b>2.0 Research Method .....</b>	<b>17</b>
2.1 Stage 1: Pilot Study .....	18
2.2 Stage 2: Case Studies .....	18
2.3 Stage 3: Expert Forum .....	18
2.4 Stage 4: Review of existing processes to integrate CMF .....	19
<b>3.0 Competency Mapping Framework.....</b>	<b>20</b>
3.1 RICS QS Competencies.....	20
3.2 Competency Mapping Scoring System .....	20
3.2.1 Breadth scale.....	20
3.2.2 Depth scale.....	20
3.2.3 Competency Mapping Template (CMT) and Competency Mapping Record (CMR).....	21
3.3 Competency Mapping Case Studies.....	22
3.3.1 Developing the Conceptual Benchmark .....	22
3.3.2 Comparative Analysis of Case Studies .....	24
3.4 Conceptual Benchmark for Graduate Route.....	25
3.5 Development of the Final Benchmark for Graduate Route.....	30
3.5.1 Pilot Study .....	30
3.5.2 Establishing the Expert Forum.....	30
3.5.3 Revision and the Ratification of the Benchmark.....	32

4.0	Detailed Analysis of the Graduate Competency Threshold Benchmark (GCTB).....	34
4.1	The GCTB - Final Benchmark .....	34
4.2	An in depth Analysis of the Benchmark and Expert Forum Perspectives .....	35
4.3	Analysis of Mandatory Competencies .....	39
4.3.1	Analysis of Mandatory Competencies by Depth Scale.....	40
4.3.2	Analysis of Mandatory Competencies by Breadth Scale.....	40
4.4	Analysis of Core Competencies.....	41
4.4.1	Analysis of Core Competencies by Depth Scale.....	42
4.4.2	Analysis of Core Competencies by Breadth Scale.....	42
4.5	Analysis of Optional Competencies .....	43
4.5.1	Analysis of Optional Competencies by Depth Scale .....	44
4.5.2	Analysis of Optional Competencies by Breadth Scale .....	44
5.0	Competency Mapping Framework in the context of Existing Processes.....	45
5.1	Programme Development and Validation.....	45
5.1.1	Introduction.....	45
5.1.2	Programme Development and the Validation Process .....	46
5.1.3	Interview Analysis.....	47
5.1.4	Further Development.....	47
5.1.5	Summary .....	47
5.2	RICS Programme Accreditation.....	48
5.2.1	Introduction.....	48
5.2.2	The Accreditation Process .....	48
5.2.3	Interview Analysis.....	48
5.2.4	Further Development.....	50
5.2.5	Summary .....	50
5.3	RICS University Partnership Process.....	51
5.3.1	Introduction.....	51
5.3.2	The Partnership Process .....	51
5.3.3	Interview Analysis.....	51
5.3.4	Further Development.....	52
5.3.5	Summary .....	52
5.4	Discussion .....	53
5.4.1	Benchmarking; the ideal.....	53
5.4.2	Benchmarks; acceptance and support .....	54
6.0	Guidelines for using the CMF .....	55
6.1	Using for Programme Development .....	55
6.2	Using for Programme Management .....	56

7.0	Conclusions.....	57
7.1	The need and the research approach.....	57
7.2	The Competency Mapping Framework (CMF).....	58
7.3	Recommended use of the CMF .....	60
7.4	Final Recommendations.....	60
7.5	Limitations.....	61
7.6	Further Research .....	61

Acknowledgements.....	62
-----------------------	----

<b>Part 3</b> References and Appendix.....	63
--	----

References .....	64
------------------	----

Appendix A Final Graduate Competency Threshold Benchmark (GCTB).....	65
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### List of Abbreviations

<b>RICS</b>	Royal Institution of Chartered Surveyors
<b>QS</b>	Quantity Surveying
<b>CMF</b>	Competency Mapping Framework
<b>CMT</b>	Competency Mapping Template
<b>CMR</b>	Competency Mapping Record
<b>GCTB</b>	Graduate Competency Threshold Benchmark
<b>CNAA</b>	Council for National Academic Awards
<b>HND</b>	Higher National Diploma
<b>APC</b>	Assessment of Professional Competence
<b>PQS</b>	Private sector consultant Quantity Surveyor
<b>CQS</b>	Contractor's Quantity Surveyor



**The research undertaken has relevance for RICS in highlighting the importance of the links between the curricula of accredited courses and the APC competencies (Assessment of Professional Competence). The paper raises a number of pertinent recommendations, and through current developments in relation to RICS accreditation policy, have already been addressed in a proactive and positive way by the RICS. The research was independently carried out through the funding support of the RICS Research Trust and therefore provides an independent, arm's length review of the issues surrounding competency mapping framework in RICS accredited courses.**

It is a requirement of RICS accreditation that all courses must consistently map and align with an appropriate APC pathway. RICS has avoided adopting a prescriptive approach to ensure that there are no barriers to innovation in curricula, and providing universities with the flexibility to adapt to changes in professional practice, such as the evolution of new technology. RICS are currently advancing an approach that would benefit graduates in today's world where transferable skills such as commercial skills are required in addition to complementary technical understanding and knowledge.

The competencies threshold benchmark concept detailed in this report provides RICS with some interesting food for thought and has obvious merits. However in practice it would be challenging to adopt the methodology on a worldwide basis given the diversity of RICS pathways and the need to maintain a consistent global accreditation policy. Other professional bodies tend to represent a single

homogeneous profession constituency and do not have to consider trying to develop policy which reflects RICS' professional diversity on a global level. While recognising these challenges for RICS itself, RICS partner universities are welcome to adopt the merits of this methodology when reviewing their accredited provision to meet the current needs of students and employers.

The UK Education Standards Board (UKESB) is developing a new Quality Threshold which will increase the focus on course curricula and its relationship to the APC competencies. It is likely that a minimum threshold will be established for mapping curricula to APC competencies. Universities will also be required to provide mapping documents on a periodic basis in line with major course reviews. In addition guidance can be produced to help universities develop courses which closely align to the competencies. The new Quality Threshold will replace the entry threshold, and the current framework of four thresholds will remain. The UKESB is looking to enhance the quality assurance with a range of more relevant standards.

We are pleased to report that the RICS has now addressed many of the concerns and issues raised in the paper, through changes to the threshold standards to be globally applicable and we will continue to review these standards for our accredited courses worldwide. This allows future professionals to complete their APC successfully through university and the workplace.

**Nick Evans**

RICS UK Higher Education Policy Manager



# Part 1 Executive Summary

## Background

Over the years QS education has evolved from being rather technical in nature into fully fledged honours degrees with greater orientation towards commercial management, cost, contracts and project management. The current network of Quantity Surveying Degrees grew from the early 1970's with the move from Diploma to Degree level qualification for entry to the profession. This transition from diplomas to university degrees was in cognition with the general transformation of the higher education sector of the British education system. The majority of these degrees were delivered by the former Polytechnics, the most of which, in turn, became New Universities in the early 1990's or thereabouts. With the conversion to University status came their right to validate and award degrees (previously validated by and awarded under the auspices of the Council for National Academic Awards (CNAA), to whom the former Polytechnics were answerable).

*“Up until 1994, the RICS ran its own examinations, but since [then] there has been a progressive change towards qualification through accredited courses at undergraduate and postgraduate level” (RICS, 2008a)*

This process has recently taken a further turn with the introduction of the Assoc. RICS route.

During this period the construction industry has undergone many changes and is currently facing a double dip economic recession which has a severe impact on opportunities for graduate employment within the sector. Construction industry employers have been vocal in reporting their perception of a lowering of employability of graduates. A recent study investigating views on both industry and academia concluded that there are significant levels of dissatisfaction with the quality of graduates (Perera & Pearson, 2011). It identified the root cause of the issue as graduates produced from different RICS accredited degree programmes having significantly different competency levels, often far below what the industry expects. This research following from the recommendations of the above report, aims at developing a competency mapping framework for programme appraisal and benchmarking.

## Research Method

This research adopted a four stage research strategy to develop the CMF.

The four stages were:

### Stage 1 – Pilot Study:

A literature review of competencies was carried out which identified the RICS APC study checklist. It used two industry and academic experts to iteratively develop and modify a competency mapping template (CMT). The CMT is a dual vector scale matrix with a Breadth scale and a Depth scale each mapped against module descriptors. Breadth scale contains study topics while Depth scale contains competencies.

### Stage 2 – Case Studies:

Four leading RICS accredited QS degree programmes were analysed and their module specifications were mapped to competencies using the CMT. This created a CMR for each case study. Descriptive statistical analysis was used to develop a conceptual competency benchmark using these four case studies.

### Stage 3 – Expert Forum:

An expert forum with 15 experts (12 industry experts and 3 academic experts) was established to revise and modify the conceptual competency benchmark. The two stage Delphi process was used to record and harmonise the views of experts. This stage produced the final graduate competency threshold benchmark (GCTB).

### Stage 4 – Review of Existing Processes to Integrate CMF:

The final stage of the research involved reviewing existing programme development and validation methods, RICS programme accreditation and RICS – University partnership processes. This involved a document review as well as interviews of three QS degree programme directors to obtain their views on these processes and the proposed incorporation of GCTB within these. The report suggests how the CMF can be used within these existing systems to ensure academic quality standards.

## Competency Mapping Framework (CMF)

### RICS QS Competencies

QS competencies are the most developed and well documented set of competencies produced by the RICS. There are 25 competencies categorised as Mandatory, Core or Optional.

**Mandatory Competencies:** Competencies that are generally required by most surveying professions. These provide a basic skill set that are required for working as a professional in the construction industry. There are 8 competencies in this category.

**Core competencies:** These define the core skill base of the QS and therefore essential for practicing as a QS. There are 7 unique competencies in this category.

**Optional competencies:** these are competencies that are desired in a QS. As such only two competencies are required to be satisfied from this category for completion at APC. However, at graduate level all these competencies become important as providing foundation level of knowledge.

The RICS distinguishes between three possible levels of attainment in each of a range of competences when setting its requirements for those seeking full membership. Briefly, these are as follows:

- **Level 1:** Knowledge (theoretical knowledge)
- **Level 2:** Knowledge and practical experience (putting it into practice)
- **Level 3:** Knowledge, practical experience and capacity to advise (explaining and advising)

Although there are clear guidelines for achieving competencies at APC, there is no stipulation as to the level of achievement of competencies at graduate level. In the absence of such a benchmark different universities achieve these competencies at different levels (Perera & Pearson, 2011) resulting in greater variation in level of quality of graduates.

### Competency Mapping Scoring System

A dual vector scale scoring matrix was developed to map programme curricula to RICS competencies. The scoring system is presented in a competency mapping template (CMT) on a MS Excel™ spreadsheet. It contains two tabs one each for the Breadth scale and Depth scale. The Breadth scale lists all study check list topics categorised to competencies vertically downwards with list of programme modules on the horizontal axis. The Depth scale consists of a matrix containing competencies on the vertical axis against programme modules on the horizontal axis.

Scoring on the Breadth scale tab is to indicate a mapping of which topics area dealt by which module with a mark-up of 1 or 0 to indicate topic covered and not covered scenarios respectively. The Breadth scale matrix is completed indicating achievement of a topic whether at Level 1 or 1 and 2. Scoring on the Depth scale tab is to indicate time spent on learning each topic summed to give total learning hours for each competency. Once CMT is completed for a degree programme, it is known as the CMR for that programme.

### Development Process of the GCTB

The pilot study was used to develop the CMT and the scoring system described in the previous section. With the use of four case studies of the RICS accredited QS degree programmes a CMR was produced for each programme. These were used as the basis for the development of a conceptual benchmark.

The expert forum appointed was requested to review the conceptual benchmark established. Their judgements were collated to produce a revised benchmark. The expert forum was then requested to further modify or agree with the revised benchmark. Following Delphi methodology for harmonising the views of experts a verified benchmark was created. This was then further organised to produce the final GCTB.

**Figure 1.1** Sample image of the Graduate Competency Threshold Benchmark (GCTB)

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C1.8.7	Supply chain management	1	1				
C1.8.8	Legislation on selecting project teams	1	0				
C2	CORE COMPETENCIES	136	43	94.4%	29.9%	2060	65%
C2.1	Commercial management of construction (T010) – Level 3	9	5	100.0%	55.6%	96	3.0%
C2.1.1	Estimating	1	1				
C2.1.2	Establishing budgets	1	1				
C2.1.3	Cash flows	1	1				
C2.1.4	Reporting financial progress against budget	1	1				
C2.1.5	Procurement of labour	1	0				
C2.1.6	Procurement of plant and materials	1	0				
C2.1.7	Procurement of sub-contracts	1	1				
C2.1.8	Financial management of supply chain	1	0				
C2.1.9	Financial management of multiple projects	1	0				
C2.2	Contract practice (T017) – Level 3	28	12	100.0%	42.9%	243	7.6%
C2.2.1	Principles of contract law	1	0				
C2.2.2	Legislation	1	0				
C2.2.3	Current case-law – look out for cases reported in journals	1	0				

## Analysis of the GCTB

The GCTB is the central construct in the CMF. The CMF consists of the competency mapping scoring system, CMT, CMR and the process of incorporating it in the RICS – University partnership.

A sample of the GCTB is presented in Figure 1.1.

The first column in GCTB presents a unique code allocated to each study topic in the GCTB. The study topics for the GCTB are derived from the RICS APC study checklist (RICS, 2008a). The Breadth scale consists of 4 columns. Level 1 and 2 columns indicate the level at which a topic is to be achieved at undergraduate level. The other

two columns present statistics of percentage coverage of topics at Levels 1 and 2 respectively. The Depth scale consists of two columns. The Credit hours column indicates the amount of time an undergraduate student should spend in learning topics related to a competency. The final column provides statistics of the percentage time allocation for a competency. The header row of the GCTB presents summary statistics applicable for the respective columns.

The summary statistics of the GCTB is presented in Table 1.1.

**Table 1.1** Summary statistics of GCTB

Competency Type		Breadth Scale				Depth Scale	
		Level 1 Topics	Level 2 Topics	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
<b>C1</b>	Mandatory Competencies	66	31	88%	41%	521	16%
<b>C2</b>	Core Competencies	136	43	94%	30%	2060	65%
<b>C3</b>	Optional Competencies	103	28	74%	20%	607	19%
<b>Totals</b>		<b>305</b>	<b>102</b>	<b>85%</b>	<b>28%</b>	<b>3188</b>	<b>100.0%</b>

Analysing the Breadth scale it is clear that there are a total of 305 topics to be covered representing 85% of total topics at Level 1. As one would expect, this comes down to 102 topics (28%) at Level 2. Core competencies have 94% coverage of topics at Level 1. However, the highest coverage at Level 2 is for Mandatory competencies (41%). This is mainly because those Mandatory competencies represent generic skills and as such are expected to be covered to a higher degree of competence at graduate level.

Analysing the Depth scale, there are a total of 3188 hours of learning time expected on RICS competencies. This is out of possible 3600 hours representing 89% of time. In comparison to average values of the case studies this represents a 4% increase from 85% RICS competency mapped time. This is much higher than current provision of most RICS accredited programmes. As expected, 65% of the time is expected to be spent on Core competencies which accounts for 57% full credit allocation for a degree programme. There is 3% increase from the case studies.

However, this represents a reasonable content considering the specialist nature of the profession. This is then followed by Optional and Mandatory competencies.

Another notable change from the existing provision is the consequent reduction in time allocation with respect to learning related to Non RICS competencies. There is a 3% reduction in time. These learning primarily represent generic study areas such as basic economics, law, mathematical skills etc. However, one could argue as these underpin direct RICS competency related topics. It is for this reason that future revisions to competencies and the study checklist should consider the inclusion of such topics at Level 1.

The amount of time to be spent on any one topic is difficult to precisely stipulate. If prescribed, it will become too prescriptive creating a barrier for innovation in curricula. The uniqueness of individual degree programmes will therefore be defined on the lines of variations in the extent and level of coverage of topics. The GCTB facilitates adequate provision for innovation in individual degree programmes while ensuring minimum levels of satisfaction of competencies.

**Table 1.2** Comparison of proposed competency time allocations (GCTB)

Competency Type		Proposed on GCTB		Existing Composition (Case Studies)	
		Credit hours	% Percentage	Credit hours	% Percentage
<b>C1</b>	Mandatory Competencies	521	15%	557	16%
<b>C2</b>	Core Competencies	2060	57%	1899	53%
<b>C3</b>	Optional Competencies	607	17%	628	17%
<b>C4</b>	Non RICS Competencies	412	11%	517	14%
<b>Totals</b>		<b>3600</b>	<b>100%</b>	<b>3600</b>	<b>100%</b>

## Incorporating and using CMF

This research examined the current programme development and validation processes used in the university systems. It also reviewed the RICS programme accreditation process and the RICS – University partnership process through a series of interviews with three well experienced academics with programme management responsibilities. It is clear that CMF presents a useful methodology to map programme curricula to RICS competencies. It also provides a tool for management of programme developments.

When new programmes are developed, the GCTB can be used to identify module content for module descriptors. It is suggested that the CMT to be used to initially map topics within module descriptors (specifications) to RICS competencies. The systematic approach presented in the CMF helps in this process to ensure that competency levels exceed minimum requirements. Upon completion of the CMT the resultant CMR forms an authentic record of how module descriptors are mapped to RICS competencies. These can then be made part of programme validation and programme accreditation documents.

The GCTB can be used to evaluate existing RICS accredited degree programmes. When a CMR for a RICS accredited degree programme is created, it forms a formal record of how degree programme content maps to RICS competencies. This can then be evaluated against the GCTB to identify whether degree programmes fully comply with the minimum thresholds identified in the GCTB. Where benchmarks are not achieved programmes can be modified to comply with GCTB. In a similar way the CMR for the programme should be updated whenever programme modifications or module modifications are carried out. It can then be checked against the GCTB to check compliance. It is proposed that the CMR be made an essential document in the RICS – University partnership process ensuring exit quality of graduates.

The main thrust of the current research seeks usefully to improve the relationship between that which is taught in our academic institutions and that which is sought by the industry, to better meet and satisfy their own demands and those of industry. However, the report recognises that some “related study skills” not currently recognised by RICS competencies may be necessary precursors, and that some time must be allowed for the delivery and assessment of these. Equally, there are certain generic “transferable” skills which it is the duty of the academic to instil, and time must be allocated to this process also.

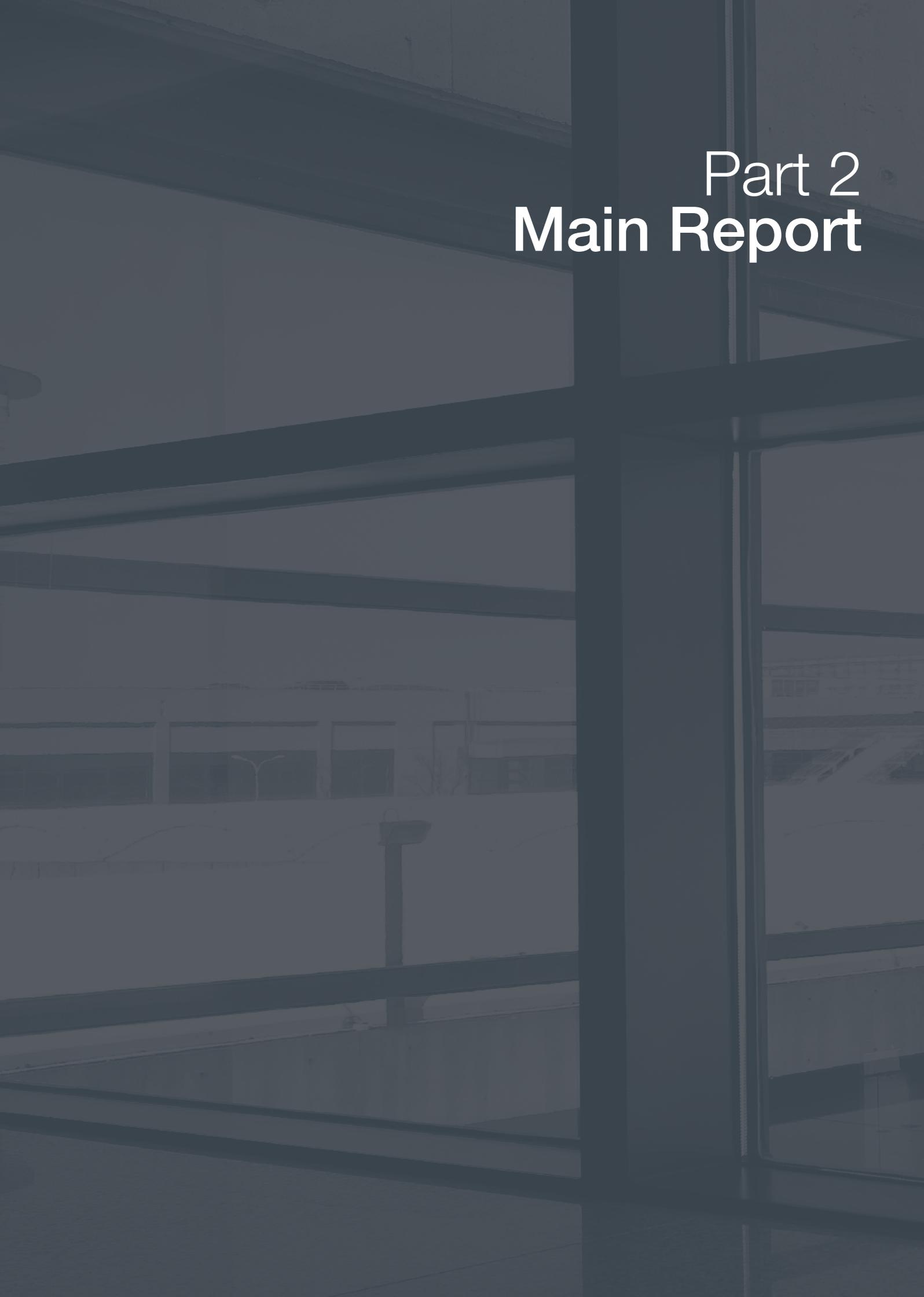
## Conclusions and Recommendations

The current research aimed to develop a competency mapping framework for programme appraisal and benchmarking. This report presents this as a competency mapping framework (CMF) consisting of three essential instruments viz. GCTB, CMT and CMR. In achieving the CMF a logical learning credit based competency mapping scoring system has been developed integrating it to the instruments stated before.

This report introduces CMF as a system for maintaining and improving quality and professional standards of QS degree programmes accredited by the RICS. The following are the primary recommendations of the report.

- It is recommended that the CMF be made an essential part of the RICS – University partnership agreement. This way it provides a mechanism to ensure that all RICS accredited programmes meet the exit threshold defined by the GCTB. Each RICS accredited programme should complete a CMR which then can be updated and presented to the RICS – University partnership meeting annually with any changes made being highlighted.
- CMF should be used for ensuring achievement of competencies in all new QS degree programmes to be accredited by the RICS. It should form part of programme validation and accreditation documents (where RICS accreditation is sought).
- In the case of all new programmes seeking RICS accreditation, completion of the CMR should be mandatory, to ensure it meets GCTB thresholds.
- The CMF also provides a useful process for the programme external examiners. They can be entrusted to comment on the changes to programmes evaluated against the GCTB thereby ensuring compliance.
- The GCTB recommends only 84% of study topic-related competencies at Level 1. It is suggested that innovative programmes should aim at achieving the remaining over and above the minimum benchmark recommended.

The GCTB developed and presented herein is based on current RICS competencies (RICS, 2009) and APC study Checklist documentation (RICS, 2008a). It is recommended that whenever competency structures change the GCTB should be updated accordingly.



# Part 2 Main Report

## 1.1 Background

Research previously carried out into aligning Professional, Academic and Industrial Development Needs of Quantity Surveyors (Perera and Pearson, 2011) indicated that there are significant disparities between Industry and Academic quantity surveyors in their interpretation of RICS competencies. The industry professionals had very high expectations of the graduate quantity surveyors while the academics thought they fulfilled these requirements.

The RICS (2009a) have clearly defined the level of achievement of competencies required of the Chartered Surveyor. However there is no such definition for the level of achievement of competencies for the graduate quantity surveyor. This has resulted in individuals and organisations interpreting levels of achievement of competencies each in their own way.

The situation can be represented graphically below (Figure 2.1).

The maroon solid line indicates the level of achievement of competencies for attainment of Chartered status as defined by RICS (2009). The Green, Red and Blue broken lines indicate the achievement of competencies by graduates as interpreted by different universities and industry professionals for Mandatory, Core and Optional competencies. These interpretations are all for RICS

accredited quantity surveying honours degree programmes across the UK. The lack of a common benchmark for the interpretation of achievement of competencies by graduates therefore, clearly might contribute to the dissatisfaction and false expectations.

The significance of the expectations of the RICS and any value placed upon components of the degrees awarded by differing academic institutions is dependent upon the definitions associated with each of the levels of attainment.

These are as follows;

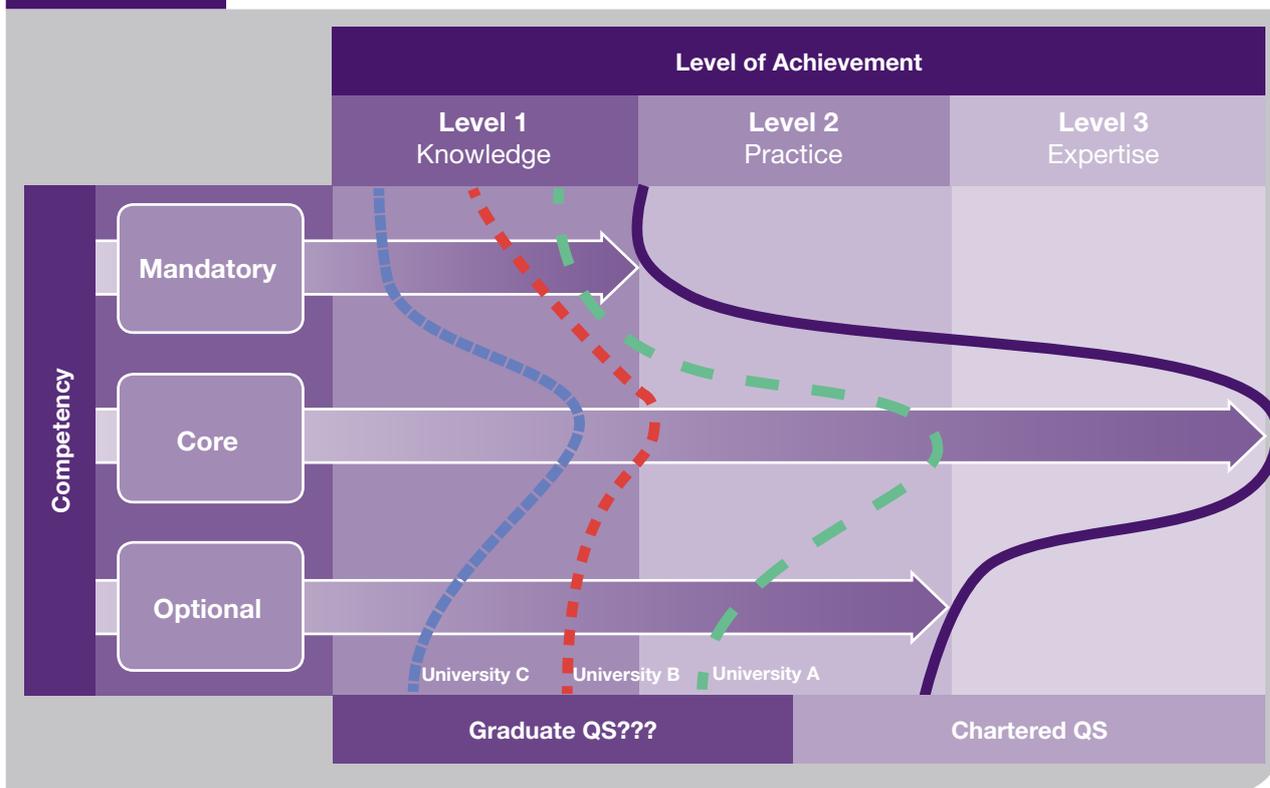
**Level 1:** Knowledge and understanding

**Level 2:** Application of knowledge and understanding

**Level 3:** Reasoned advice and depth of technical knowledge

It will be noted that the RICS generally seeks Level 3 only in the area of Core Competences. Competency at Level 3 can only be achieved after considerable working experience in the industry. It is unlikely that newly qualified graduates will have attained Level 3, with its suggestion of the offering of reasoned client advice, unless they have followed a five year Part Time mode of study, with constant exposure to the work place throughout this time. However, it is clear that different universities conducting RICS accredited programmes proclaim that they achieve Level 3 in some competencies for all students.

**Figure 2.1** Competency Benchmark Interpretation



Source: Perera and Pearson, 2011

Detailed analysis of RICS accredited programme curricula of different universities also exposed that there are significant gaps in competency mapping across different programmes. No such exercise can be deemed reliable and consistent unless there is a fairly precise scoring system or “template” against which to assess the extent of mapping of their curricula. Such a system must achieve two things: a precise accountable interpretation (a recognisable link between the curricula and the competencies) and a precise accountable value (a “score” which demonstrates the “Level” of competence achieved). The lack of a mechanism to systematically evaluate programme module content against RICS competencies and a benchmark for graduate competencies is therefore considered as the core cause of this problem.

Programme approval and validation of new or significantly changed programmes are carried out by the universities according to HEFCE (2010) guidelines. Each module on a new or revised programme will be scrutinised with regards to its learning outcomes, delivery etc. Most professionally oriented programmes sought approval of respective accrediting bodies, in this case the RICS, usually by reference to the External Examiners and validation panel members who will act on behalf of the RICS. The Education Committee of the RICS accredit programmes upon review of documentation for the programmes. In the absence of a systematic process to evaluate the extent of competency mapping it risks being carried out based only on subjective judgement and cursory inspection.

In the UK, the RICS-University partnership agreement is the main mechanism to ensure the academic quality of accredited programmes. This process involves ensuring that certain minimum standards, known as “thresholds” as set out in the guidance and policy document on University partnerships (RICS 2008b), are achieved. It governs the entry criteria for programmes, teaching quality and the attainment of the research and innovation threshold. A stipulation regarding relevant employment of graduates has been waived of late, due to the current economic situation (RICS, 2008b).

At present, there is no formal obligation for programme teams to map their curricula against specific RICS Competencies at specific Levels, although most will seek this outcome to some extent. The guidance and policy document (RICS, 2008b, p.26) does list and refer to the APC requirements, suggesting the “likelihood of meeting threshold standards and leading to an existing APC pathway” as a factor in the accreditation or otherwise of a programme.

The 2010 “vision for high quality education” was set out by an Education Task Force in 1999 (RICS, 2008b). This envisaged strong partnerships between the RICS and a limited number of recognised centres of academic excellence, characterised by not only “an appropriate range of curricula at undergraduate and postgraduate levels”, but also “increased freedom for selected universities to develop courses and methods of delivery” at all academic levels. This is a far from prescriptive recipe, which lacks consideration of matching specific levels to core competencies.

## 1.2 Aim & Objectives

These problems and drawbacks are the root cause of dissatisfaction with the quality of graduates expressed by industry professionals. This research aims to develop a RICS professional Competency Mapping Framework (CMF) for analysing the compliance of quantity surveying programme curricula with RICS QS competencies. Achieving this core aim is fundamental to success in aligning the views of industry, academia and the RICS.

The core aim of the research is further analysed into a set of objectives as follows:

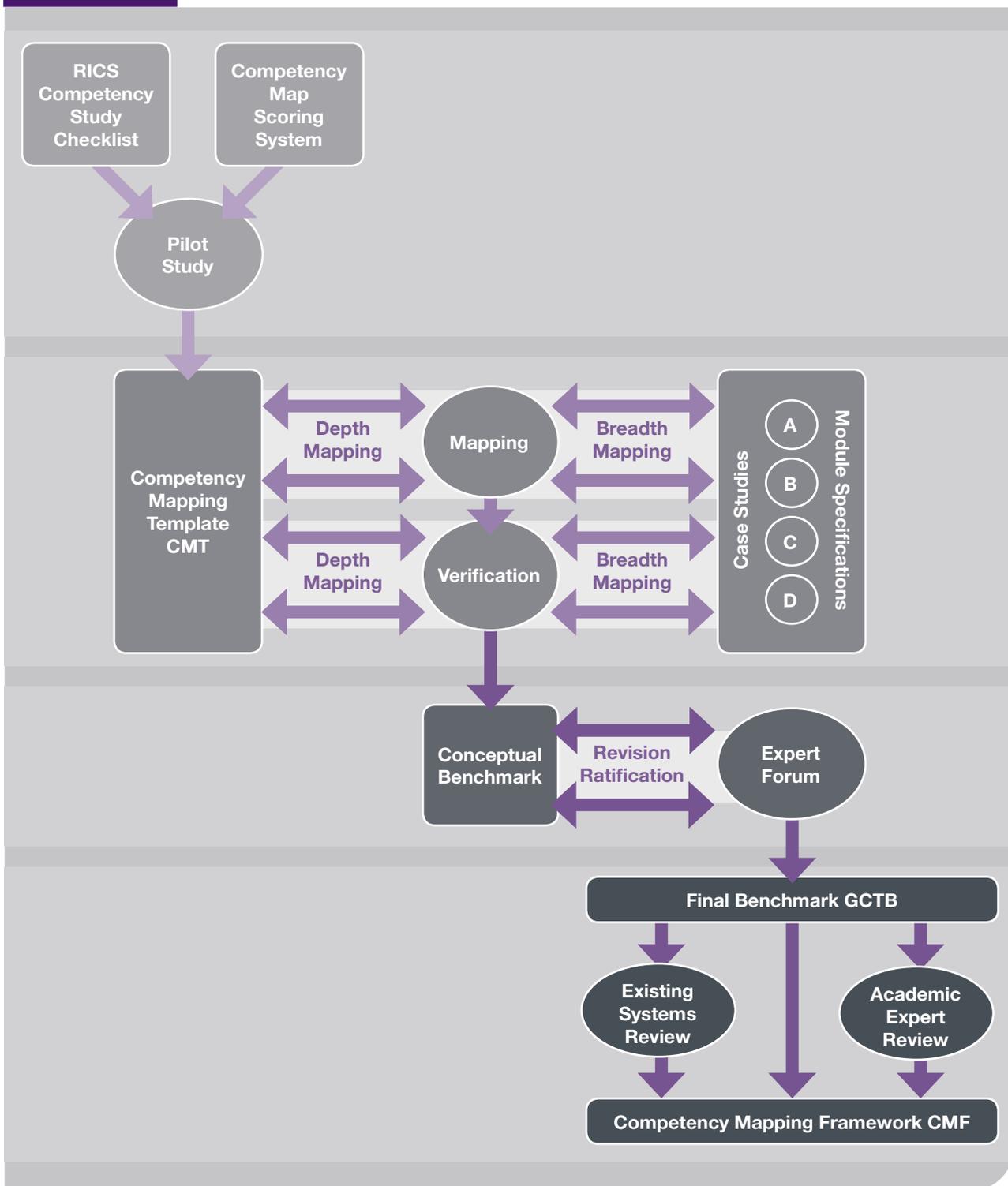
- Examination of the mandatory, core and optional competencies and benchmarking the expected level of compliance for RICS accredited degree programmes.
- Development of a competency mapping and assessment methodology to analyse compliance of programmes to set benchmarks for Graduate route.
- Development of a competency mapping scoring system to analyse the level of mapping and gaps.
- Analysis of the current university programme approval and validation methods and the proposal of a methodology to incorporate a new competency mapping framework for programme approval and validation.
- Analysis of the RICS programme accreditation process to incorporate the competency mapping framework within programme accreditation.
- Analysis of and review of the RICS-University partnership agreement process and propose further developments to it incorporating the Competency Mapping Framework (CMF).

This report presents a detailed account of how these objectives were met and of the development and use of the CMF.

This research uses four distinct data gathering phases, which culminated in data analysis and reporting, to benchmark the expected level of achievement of competencies by the quantity surveying graduates

produced by RICS accredited programmes. The final outcome is the Competency Mapping Framework (CMF). The key stages and process are illustrated in Figure 2.2 and further explained below.

**Figure 2.2** Research Method





The following section provides details of the four stages, and the main research instruments used to achieve the research objectives and to develop the graduate competency threshold benchmark (GCTB) and the competency mapping framework (CMF).

## 2.1 Stage 1: Pilot Study

A literature review was conducted to identify the full QS Study checklist structured by RICS QS competencies. This review was in addition to the results of the previous study (Perera and Pearson, 2011) which sets the framework for this research. This was followed by developing a competency mapping scoring system that could provide a numerical scale mapping of competencies to degree programme curricular (refer section 3.2). A pilot study (refer section 3.5.1) involving two academic and industry experts were used to test the scoring system and develop the final Competency Mapping Template (refer section 3.2.3). This template forms the basis for the carrying out of case studies mapping competencies to existing degree programmes.

## 2.2 Stage 2: Case Studies

The case studies (A, B, C, and D) provide the basis for the development of the benchmark for graduate competencies. These include examination of four RICS accredited QS degree programmes. The CMT developed in stage 1 provides the template to map curricular to RICS competencies. The curricular of these programmes (module specifications) were mapped against RICS QS competencies at detailed level using coverage (as a breadth scale – section 3.2.1) and amount of time spent in learning i.e. module credits (as a depth scale – section 3.2.2). The ensuing mapping was then verified for accuracy and consistency with programme directors responsible for their delivery. The mapping method and process are

further detailed in section 3.3. The output of this stage is the Conceptual Benchmark (refer section 3.4) based on the analysis of the four case studies.

The four case studies selected were leading QS honours degree programmes in the UK all accredited by the RICS. The dual vector scale representing breadth and depth of coverage of competencies informs the current practice in academia. The mapping matrix CMT is an excel spreadsheet with two worksheets or tabs. The breadth mapping worksheet has over 400 rows as it contains the full QS Study checklist whilst the depth mapping worksheet has circa 40 rows since it only includes the RICS QS competencies. The two dimensional matrix thus comprised of QS Study checklist (for breadth mapping tab) and RICS QS competencies (for depth mapping tab) on the Y – axis (vertical listing) and Programme specifications on the X – axis for both tabs (horizontal listing). The rationale for breadth mapping at Study checklist level and depth mapping at competency level is explained in section 3.2.

Both breadth and depth vector scale mappings of the four case studies were initially carried out using the respective module specifications of the programmes. The results were then sent out to the programme leaders concerned for necessary adjustments and ratifications. Descriptive statistics such as mean and percentage scores etc. were used to analyse the results of the four case studies as conceptual benchmark. This forms the basis for the Stage 3 of the research.

## 2.3 Stage 3: Expert Forum

An expert forum comprising 15 industry and academic experts were formed with the objective of revising and refining the conceptual benchmark established in the Stage 2 of the research. The identified industry experts come from large, SME and micro level organisations.



These include quantity surveying employer organisations from both traditional consulting and contracting sectors. A total of 15 interviews were thus carried out comprising 3 academics (programme leaders), 6 consultant quantity surveyors (2 experts from each category of large, SME and micro) and 6 contractor quantity surveyors (2 experts from large, 3 from SME and 1 from Micro level organisation).

This forum was used to benchmark, through an iterative process, the expected level of achievement of competencies by the quantity surveying graduates produced by RICS accredited programmes. Initially, interviews were conducted with each expert using the conceptual benchmark. These interviews were conducted either face to face or using electronic communication with detailed guidance provided in each case. The views of the experts on the conceptual benchmark were sought. The interviews thus involved the experts revising the conceptual benchmark to reflect their expectations of a graduate level attainment of RICS QS competencies. Analysis of these diverse views resulted in the development of a revised benchmark which has similar layout as the conceptual benchmark.

The final phase of the development process involved using the same identified experts to evaluate the revised benchmark in order to adjust and ratify the revised benchmark values. The revised benchmark was sent via email to the experts with detailed guidance of what is expected. A reminder email was sent accordingly at the end of the first week with a follow-up email in the subsequent week. With circa 80% response rate, around 70% of the experts who replied said they agree and are satisfied with the revised benchmark in which case they returned the revised benchmark with no correction. The remaining 30% of the experts have some minor corrections to make. In this case, they adjusted the revised benchmark values in a similar manner to the initial process. The experts were also asked to provide any further feedback they might have.

The resulting findings were analysed using relevant descriptive statistics and presented as a ratified benchmark. Delphi technique (Rowe and Wright, 2001) was used to extract and harmonise the views of the experts and to finalise the benchmark level of achievement of competencies for graduate quantity surveyors. The ratified benchmark was fine-tuned, adjusted and finalised to produce the minimum graduate competency threshold benchmark (GCTB).

## 2.4 Stage 4: Review of Existing Processes to Integrate CMF

The GCTB forms the basis of the final stage of the research, where it is incorporated in to existing programme curricular development and management process creating the Competency Mapping Framework. A detailed review of the existing programme validation and management methods were carried out. Three well experienced RICS accredited QS honours degree programme directors (who are also full members of the RICS) were selected to develop the mechanism to integrate the GCTB to create the final CMF.

Interviews evaluated the programme approval and validation methods, programme accreditation process and RICS-University partnership agreement process, and how to further improve these processes through the incorporation of the GCTB developed in stage 3. These interview stages are further detailed in section 5. The content analysis of the interviews conducted was the catalyst for the identification of key issues related to the above processes. Accordingly a system to incorporate the developed graduate threshold competency benchmark as a fundamental part of the RICS-University partnership agreements was proposed. This is the CMF.

### 3.1 RICS QS Competencies

The RICS QS Competencies provide the basis on which the competence of a chartered quantity surveyor is defined. These are arranged into three groupings, depending upon their perceived relevance to the role of the quantity surveyor:

- 1** – Mandatory Competencies: personal, interpersonal and professional practice and business skills common to all pathways [into membership] compulsory for all candidates.
- 2** – Core Competencies: primary skills of the candidate's chosen [RICS] pathway
- 3** – Optional Competencies: selected as an additional skill requirement for the candidate's chosen [RICS] pathway from a list of competencies relevant to that pathway. In most cases there is an element of choice, though driven, usually, by their employer's specialism.

The RICS distinguishes between three possible levels of attainment in each of a range of competences when setting its requirements for those seeking full membership. Briefly, these are as follows:

- **Level 1:** Knowledge (theoretical knowledge)
- **Level 2:** Knowledge and practical experience (putting it into practice)
- **Level 3:** Knowledge, practical experience and capacity to advise (explaining and advising)

There are 8 Mandatory competencies, 7 Core competencies and 10 Optional competencies. The RICS stipulates that an APC candidate needs to achieve all Mandatory competencies at Level 2 or above, all Core competencies at Level 3 (except the one not relevant to their specialisation, consulting or contracting, which must be at Level 2. The further requirement is for two Optional competencies at Level 2 or above.

There is no stipulation as to the level of achievement of competencies at graduate level. In the absence of such a benchmark different universities achieve these competencies at different levels (Perera & Pearson, 2010). The following sections discuss the development of a graduate level benchmark for RICS QS competencies.

### 3.2 Competency Mapping Scoring System

The competency mapping scoring system is developed as a dual scale matrix consisting of a Breadth scale and a Depth scale. The Breadth scale indicates the extent of coverage of competencies as mapped to RICS QS Study Checklist (RICS, 2008). The check list provides 359 individual study topics categorised in to 25 different competencies. These signify the extent of coverage (breadth of knowledge) expected under the current set of competencies. The Depth scale provides an indication of the time spent on achieving competencies. These are explored in detail in the following sub sections.

#### 3.2.1 Breadth Scale

RICS QS competencies were analysed at a detailed level using the QS Study Checklist (RICS, 2008a). This checklist is used as the framework for developing the conceptual benchmark where the binary alternatives 1 and 0 are used to indicate coverage of a topic under a competency.

- 1** – Reflects that the topic is dealt with by the degree programme concerned.
- 0** – Reflects that it is not dealt with by the degree programme concerned.

These are indicated against the three level classification of level of achievement by the RICS (RICS, 2009). These are as follows:

- **Level 1:** Knowledge and understanding
- **Level 2:** Application of knowledge and understanding
- **Level 3:** Reasoned advice and depth of technical knowledge

A specific topic may be covered at both Levels 1 and 2. In this case, there is a value 1 in both Level 1 and Level 2 columns. If a topic achieves Level 2 coverage then we assume there is always Level 1 coverage as well. In another topic, if the topic is dealt with at Level 1 only then values 1 and 0 were placed against columns Level 1 and Level 2 respectively. Level 3 achievements are not expected to be covered in degree programmes as it is not practical to expect a graduate to cover a competency at Level 3. However, as the benchmark reflects a minimum conceptual achievement level, it will not prevent anyone achieving a competency at Level 3 if it is feasible within their degree programme.

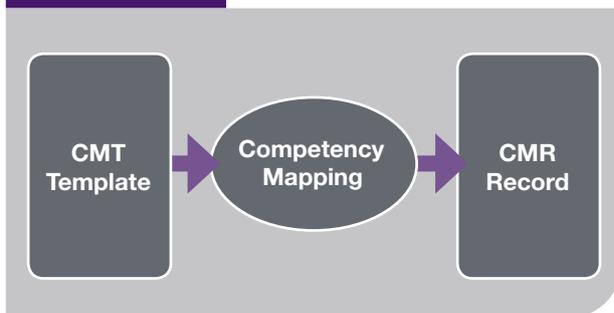
#### 3.2.2 Depth scale

This reflects the amount of time spent on achieving a competency. In degree programmes, time spent on achieving module outcome is stipulated as Credits where 10 hours spent is considered as 1 Credit. A typical 20 Credit point module reflects 200 hours of learning by the student. This constitutes direct contact with formal teaching; lectures, seminars, tutorials and such direct contact time as well as students expected study time on the module content (time spent by students on their own in learning a topic concerned). The depth scale is only indicated at competency level and not at topic level as it is impractical to stipulate an expected number of study hours at a detailed level. Percentage scores are used to indicate the amount of time spent on each competency. These provide valuable information on relative time spent for each competency. The Depth scale represents the time expected to be spent on learning a competency at undergraduate level.

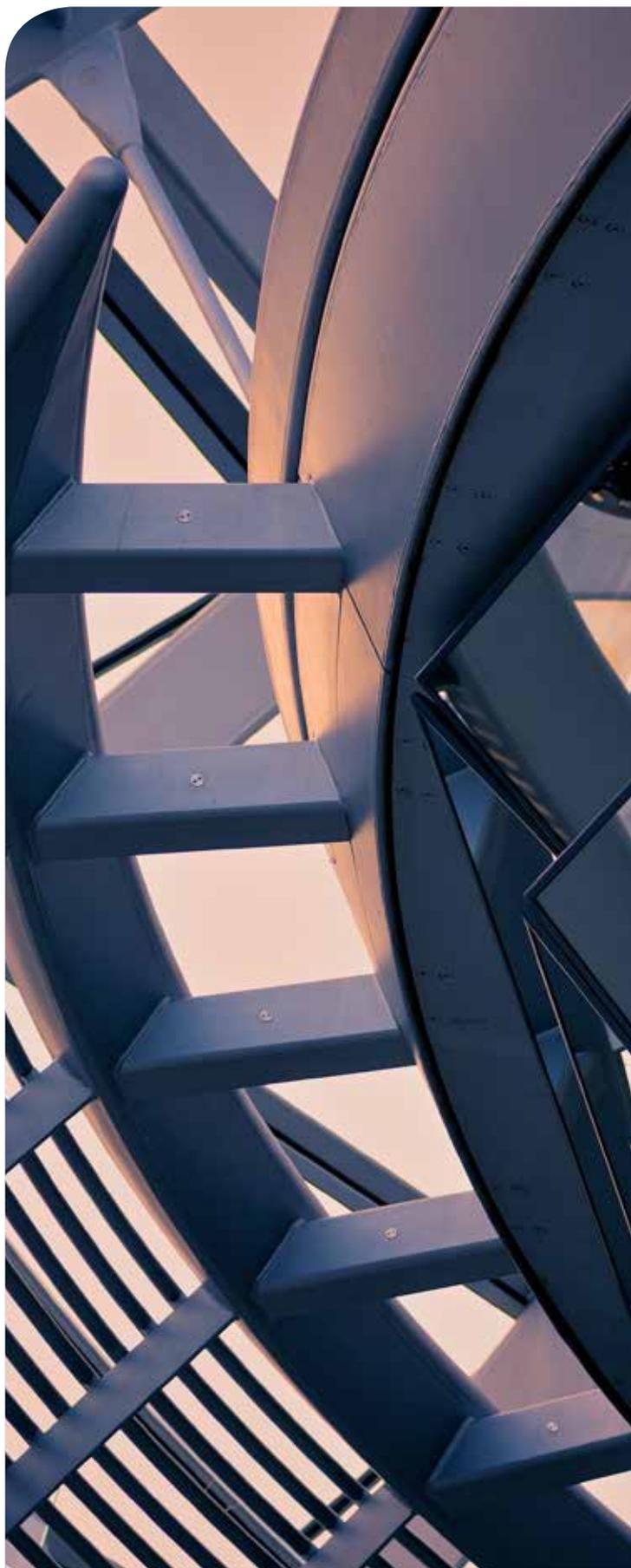
### 3.2.3 Competency Mapping Template (CMT) and Competency Mapping Record (CMR)

A Competency Mapping Template (CMT) incorporating the Breadth and Depth scales was developed on a spreadsheet using the competency mapping scoring system described above (Refer Appendix B & C). It contains two tabs, one each for the Breadth scale (mapping) and the Depth scale (mapping). The Breadth mapping tab contains the study checklist topics organised into competencies (vertical) mapped against module specifications (horizontal). In a similar way the Depth mapping tab contains the RICS QS competency list (vertical) mapped against module specifications (horizontal).

**Figure 2.3** Competency Mapping Process



The mapping process involves taking each module specification, identifying module topics and mapping them against the Breadth scale. Subsequently, time utilised for each topic for a competency is estimated and noted in the corresponding cell in the Depth scale mapping tab. When all Breadth and Depth scale information is recorded for a degree programme it becomes a record of how module content is mapped against RICS competencies. This is termed as the Competency Mapping Record (CMR) for the programme.



## 3.3 Competency Mapping Case Studies

### 3.3.1 Developing the Conceptual Benchmark

The conceptual benchmark was developed by mapping module specifications of four RICS accredited QS honours degree programmes to the RICS Study Checklist (RICS, 2008a) using the CMT described in section 3.2.3. The four degree programmes are considered as four case studies. The process used in mapping competencies for the case studies is summarised below:

- 1.** Invitation for case study of the selected QS degree programme was sent to the respective programme director explaining the process.
- 2.** The module specifications and the programme module structure were obtained from the respective case study (university).
- 3.** The Competency Mapping Template (CMT) with the Breadth and Depth scales is used to map the RICS QS competencies to the module specifications.
- 4.** Programme module specifications are individually mapped to competencies using the CMT by the research team.
  - a.** Topics for each module were identified and mapped to those in the Breadth scale of study checklist topics.
  - b.** Using the module credit allocation and proportionately distributing it to module content, the learning time allocation for each topic was estimated and allocated in the Depth scale.
  - c.** The process continued iteratively until mapping of all modules was completed to researchers' satisfaction.
  - d.** The completed mapping for a degree programme is termed a competency mapping record (CMR).
- 5.** The completed competency mappings (CMRs) were then sent to the respective programme directors for further revision.
- 6.** Revisions were discussed and agreed with the programme directors to finalise the competency mapping record (CMR) of each programme.

Each RICS competency is made up of several topics (known as the study checklist). The breadth mapping, which is the scope of coverage, was carried out across Level 1 and Level 2. Level 3 is not included because a QS graduate would not have attained this level upon graduation. Since the benchmark is a minimum threshold it is not required to be considered. The depth mapping was carried out at competency level, unlike the breadth mapping which was carried out at detailed study checklist level. Credits hours are used for the depth mapping. There are a total of 360 Credits (3600 hours) of learning in a degree programme. Therefore typically there will be less than 3600 hours available to map against RICS competencies. This is because a typical degree programme contains topics that related to but not specifically identified within RICS competencies. For example, subject areas of basic economics, mathematics, or topics such as the background to the legal system are not directly related to RICS competencies.

Both breadth and depth mappings of the above case studies were initially carried out by the researchers using the respective programme specifications. The results were then sent out to the programme leaders of the degree programmes concerned for necessary adjustments and ratifications. Descriptive statistics such as mean and percentage scores were used to analyse and present the results of the case studies as conceptual framework.

**Table 2.1**

**Comparative analysis of competency mapping case studies**

		A	B	C	D	Average	Percentage	Standard Deviation
<b>University:</b>								
<b>Level:</b>								
<b>Credits:</b>		340	330	460	450			
<b>Hours</b>		3400	3300	4600	4500			
<b>Code</b>	<b>Competency</b>							
<b>Mandatory Competencies</b>								
<b>M001</b>	Accounting principles and procedures	5	0	5	5	3.75	0.1%	2.50
<b>M002</b>	Business planning	30	10	5	55	25	0.8%	22.73
<b>M003</b>	Client care	25	5	60	40	32.5	1.1%	23.27
<b>M004</b>	Communication and negotiation	89	165	185	155	148.5	4.8%	41.58
<b>M005</b>	Conduct rules, ethics and professional practice	20	30	55	10	28.75	0.9%	19.31
<b>M007</b>	Data management	85	65	90	120	90	2.9%	22.73
<b>M008</b>	Health and safety	30	50	40	195	78.75	2.6%	77.93
<b>M010</b>	Teamworking	132	95	130	240	149.25	4.8%	62.84
<b>Core Competencies</b>								
<b>T010</b>	Commercial management of construction	50	105	120	10	71.25	2.3%	50.72
<b>T017</b>	Contract practice	373	190	240	90	223.25	7.2%	117.71
<b>T013</b>	Construction technology and environmental services	377	597	655	1090	679.75	22.0%	298.56
<b>T022</b>	Design economics and cost planning	230	280	230	270	252.5	8.2%	26.30
<b>T062</b>	Procurement and tendering	216	253	130	130	182.25	5.9%	62.20
<b>T067</b>	Project financial control and reporting	65	55	63	55	59.5	1.9%	5.26
<b>T074</b>	Quantification and costing of construction works	380	520	430	390	430	13.9%	63.77
<b>Optional Competencies</b>								
<b>T008</b>	Capital allowances	2	0	20	20	10.5	0.3%	11.00
<b>M006</b>	Conflict avoidance, management and dispute resolution procedures	91	30	120	30	67.75	2.2%	45.17
<b>T016</b>	Contract administration	50	60	82	60	63	2.0%	13.52
<b>T020</b>	Corporate recovery and insolvency	0	0	0	0	0	0.0%	0.00
<b>T025</b>	Due diligence	0	0	0	0	0	0.0%	0.00
<b>T045</b>	Insurance	30	10	0	0	10	0.3%	14.14
<b>T063</b>	Programming and planning	80	80	103	185	112	3.6%	49.86
<b>T066</b>	Project evaluation	100	45	225	220	147.5	4.8%	89.49
<b>T077</b>	Risk management	60	15	110	20	51.25	1.7%	44.04
<b>M009</b>	Sustainability	100	150	265	150	166.25	5.4%	69.93
	<b>Total hours</b>	<b>2620</b>	<b>2810</b>	<b>3363</b>	<b>3540</b>	<b>3083.25</b>	<b>100.0%</b>	<b>438.23</b>
	<b>Percentage coverage of competencies</b>	<b>77%</b>	<b>85%</b>	<b>73%</b>	<b>79%</b>	<b>78%</b>		<b>0.05</b>



### 3.3.2 Comparative Analysis of Case Studies

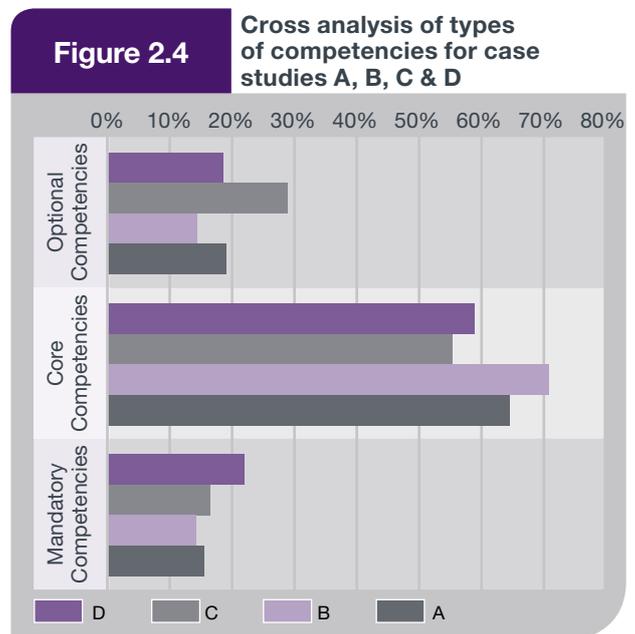
The four case study competency mappings were collated and statistically analysed to develop the conceptual benchmark for mapping graduate level QS competencies. A summary of the Depth Mapping of case studies is provided in Table 2.1.

There are many variations in how the programme curricula of individual case studies (universities) are mapped to competencies. Most variations are in the mapping of a few core competencies and most optional competencies.

This is somewhat expected as individual programmes have their own strengths and character. The average total mapping of competencies stands at 78%, indicating that 22% of the curricula in undergraduate programmes reflects knowledge content that does not directly map against competencies. These are often fundamental and basic knowledge components that are essentially required in order to be able to deliver knowledge that would assist in the achievement of competencies.

A detailed analysis of the weightings for mandatory, core and optional competencies across the four case studies is presented in Figure 2.4.

It is very clear that all universities have given overwhelming priority to Core competencies. Two universities have given the second level of priority for either Optional or Mandatory competencies.



### 3.4 Conceptual Benchmark for Graduate Route

The results of the previous research (Perera and Pearson, 2011) coupled with further issues identified from the literature and the competency mapping exercise formed the basis of the conceptual benchmark. The conceptual benchmark (see Table 2.2) is a two dimensional matrix reflecting overall average coverage and average depth of coverage of the four case studies. The conceptual benchmark values reflect the levels of achievement of competencies by graduates completing a degree from the

four case study QS programmes. It reveals under Level 1 and Level 2 columns the topics covered in all the four RICS accredited degree programmes examined. A value of 1 against a particular topic implies that at least one of the case study degree programmes covers this. The Credits hours' column, which is the average of the four case study values, indicates typical expected times (in hours) devoted to each competency whilst the Percentage column shows the relative time proportion. Only a brief extract of the conceptual benchmark is shown in Table 2.2 as the table extends to several pages.

**Table 2.2** Sample of Conceptual Benchmark

	Level 1	Level 2	Level 3	Credits hours	Percentage
<b>Mandatory Competencies</b>					
<b>Accounting principles and procedures (M001) – Level 1</b>				3.75	0.1%
Balance sheets / profit and loss account	0	0			
Taxation	1	0			
Revenue and capital expenditure	0	0			
Cash flows	1	0			
Profitability	1	0			
Insolvency	0	0			
Legislation	1	0			
<b>Business planning (M002) – Level 1</b>				25	0.8%
Legislation	1	0			
Short / long term strategies	1	0			
Market analysis	1	0			
Five year plans	1	0			
Business support services – administration, secretarial, HR, IT etc.	1	0			
Staffing levels – recruitment / turnover	1	0			
Continued...					
<b>Core Competencies</b>					
<b>Commercial management of construction (T010) – Level 3</b>				71.25	2.3%
Estimating	1	1			
Establishing budgets	1	1			
Cash flows	1	1			
Reporting financial progress against budget	1	1			
Procurement of sub-contracts	1	0			
Financial management of supply chain	1	0			
Financial management of multiple projects	1	0			

	Level 1	Level 2	Level 3	Credits hours	Percentage
<b>Core Competencies Cont.</b>					
<b>Contract practice (T017) – Level 3</b>				223.25	7.2%
Principles of contract law	1	0			
Legislation	1	0			
Current case-law – look out for cases reported in journals	1	0			
Standard forms of main and sub contract – e.g. JCT, NEC/ECC, GC Works, ICE, ACA, IChemE, FIDIC, etc.	1	1			
Final Accounts	1	1			
Completion	1	0			
Liquidated and Ascertained Damages	1	0			
Defects rectification period	1	1			
<b>Construction technology and environmental services (T013) – Level 3</b>				679.75	22.0%
Construction technology	1	0			
Substructures – basements, types of piling, etc.	1	0			
Superstructures	1	0			
Comparison of concrete / steel frames	1	0			
External walls, windows and doors	1	0			
Cladding / glazing	1	0			
Planning legislation and procedures	0	0			
Party wall issues / rights of light	0	0			
Dangerous / banned substances – asbestos etc	0	0			
Pre-fabrication	1	0			
Disability legislation	1	0			
<b>Design economics and cost planning (T022) – Level 3</b>				252.5	8.2%
Economics of design – site density, wall / floor ratio, storey heights, room sizes, lettable / non-lettable	1	1			
Sources of cost data – BCIS / in-house database / other external sources	1	1			
Inflation (tender / construction)	1	1			
Location factors, regional variations	1	1			
Currency fluctuations	1	0			
Estimating	1	1			
Cost Plans	1	1			
Cost Planning	1	1			
Life cycle costing - capital / running costs / replacement	1	1			
Value Engineering	1	1			
Value Management	1	1			
Continued...					
<b>Optional Competencies</b>					
<b>Capital allowances (T008)</b>				10.5	0.3%
Current legislation	1	0			
Capital and revenue expenditure	1	0			

	Level 1	Level 2	Level 3	Credits hours	Percentage
<b>Optional Competencies Cont.</b>					
Taxation	1	0			
Capital Allowances legislation	1	0			
Claiming capital allowances	1	0			
Plant and machinery	1	0			
Enhanced capital allowances	0	0			
<b>Conflict avoidance, management and dispute resolution procedures (M006)</b>				67.75	2.2%
How standard forms of contract deal with conflict avoidance and dispute resolution	1	0			
Conflict avoidance	1	0			
Partnering	1	0			
Negotiation	1	0			
Mediation	1	0			
Conciliation	1	0			
Adjudication	1	0			
Arbitration	1	0			
Expert Witness	1	0			
Continued...					
	<b>298</b>	<b>99</b>		<b>3083.25</b>	<b>100.0%</b>

On the whole, the conceptual benchmark shows the average level of graduate competency achievement from four RICS accredited programmes. The conceptual benchmark indicates graduate attainment of RICS QS competencies. This provided a basis for further investigation of industry and academic views of the conceptual benchmark and their expectations. This is essential to harmonise diverse views and to generate a minimum graduate competency benchmark that satisfies the aspirations of all stakeholders.

**Table 2.3** Summarised Conceptual Benchmark – Depth & Breadth Scales

		Depth scale		Breadth Scale	
		Learning Hours		% Coverage of topics	
		Average	Time %	Level 1	Level 2
<b>Mandatory Competencies</b>					
<b>M001</b>	Accounting principles and procedures	3.75	0.1%	80.0%	0.0%
<b>M002</b>	Business planning	25	0.8%	100.0%	0.0%
<b>M003</b>	Client care	32.5	1.1%	75.0%	50.0%
<b>M004</b>	Communication and negotiation	148.5	4.8%	100.0%	87.5%
<b>M005</b>	Conduct rules, ethics and professional practice	28.75	0.9%	64.3%	14.3%
<b>M007</b>	Data management	90	2.9%	100.0%	71.4%
<b>M008</b>	Health and safety	78.75	2.6%	100.0%	0.0%
<b>M010</b>	Teamworking	149.25	4.8%	100.0%	75.0%
<b>Core Competencies</b>					
<b>T010</b>	Commercial management of construction	71.25	2.3%	100.0%	55.6%
<b>T017</b>	Contract practice	223.25	7.2%	100.0%	42.9%
<b>T013</b>	Construction technology and environmental services	679.75	22.0%	85.7%	0.0%
<b>T022</b>	Design economics and cost planning	252.5	8.2%	100.0%	73.3%
<b>T062</b>	Procurement and tendering	182.25	5.9%	92.3%	15.4%
<b>T067</b>	Project financial control and reporting	59.5	1.9%	100.0%	30.0%
<b>T074</b>	Quantification and costing of construction works	430	13.9%	95.2%	38.1%
<b>Optional Competencies</b>					
<b>T008</b>	Capital allowances	10.5	0.3%	58.3%	0.0%
<b>M006</b>	Conflict avoidance, management and dispute resolution procedures	67.75	2.2%	100.0%	0.0%
<b>T016</b>	Contract administration	63	2.0%	95.5%	9.1%
<b>T020</b>	Corporate recovery and insolvency	0	0.0%	15.4%	0.0%
<b>T025</b>	Due diligence	0	0.0%	20.0%	0.0%
<b>T045</b>	Insurance	10	0.3%	50.0%	0.0%
<b>T063</b>	Programming and planning	112	3.6%	100.0%	50.0%
<b>T066</b>	Project evaluation	147.5	4.8%	100.0%	76.9%
<b>T077</b>	Risk management	51.25	1.7%	84.6%	53.8%
<b>M009</b>	Sustainability	166.25	5.4%	100.0%	8.3%
<b>Total</b>		<b>3083.25 hours</b>	<b>100.0%</b>	<b>290 topics</b>	<b>93 topics</b>

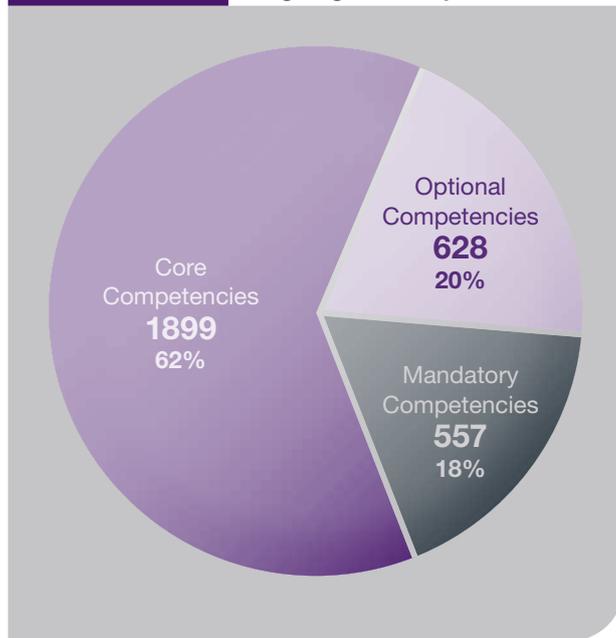
In order to provide a meaningful comparison of the priorities of the Conceptual Benchmark the summary of the depth and breadth scales for competencies is provided in Table 3.3.

This table is derived from obtaining average figures from the four case studies completed. The Depth scale was developed using mean time periods utilised for each competency. The Breadth scale was developed by considering the frequency of engagement with the topics in the study checklist and considering at least dealing with a topic once by any of the case study programmes (considered as 1 – contributing to the count). There are 290 topics used across 4 case studies at Level 1 and 93 at Level 2. This does not necessarily imply that any one case study (university) used all 290 topics identified here. The total of 290 and 93 for Level 1 and 2 respectively indicate the maximum number of topic dealt with across four case studies.

The core competencies have the greatest weightage with 62% share followed by optional competencies with 20% and mandatory competencies with 18% share (Figure 2.4). There are a total of 3083 hours of learning representing 86% of learning time for a programme.

The conceptual benchmark provides the basis of development of the final benchmark for graduate level competencies. It was presented to the expert forum for revision. The process is fully described in the following section.

**Figure 2.5** Conceptual Benchmark – Weightage of competencies





## 3.5 Development of the Final Benchmark for Graduate Route

The conceptual benchmark was presented to a selected expert forum for revision of both breadth and depth scales for all study topics and competencies. Using the Delphi methodology the views of experts were harmonised to create the final benchmark. The process is explained in detail in the following sections.

### 3.5.1 Pilot Study

A two stage pilot study involving two experts was carried out to develop the framework for the conduct of the expert forum. The two experts selected were:

1. A very experienced senior academic
2. A very experienced senior practitioner with experience in both consulting and contracting practices.

The aim of the pilot study was twofold:

1. Further develop the map scoring system developed to carry out the competency mapping case studies and establish the conceptual benchmark. This was stage one of the pilot study process.
2. Carry out a preliminary run of the expert forum interviews in presenting conceptual benchmark and obtaining their views. This process helped in the development of the interview process to collect data for the revision of the conceptual benchmark. This was the second stage of the pilot study.

On completion of the pilot study the process protocol to follow in the expert forum was developed.

### 3.5.2 Establishing the Expert Forum

The forum of experts consists of industry practitioners from large, SME and micro level quantity surveying organisations. These include quantity surveying employer organisations from both the traditional consulting and contracting sectors. A minimum of two experts from each category were sought for this exercise. In addition, three Quantity Surveying programme directors from RICS accredited programmes were also invited to participate. All members were experienced academics and chartered surveyors. The forum consisted of 15 members representing all types of quantity surveying employers and academics (Table 2.4).

**Table 2.4** The composition of the Expert Forum

	Type of Organisation	Abbreviation	Size	Code
1	Consulting practice	PQS	Large	L
2	Consulting practice	PQS	Large	D
3	Consulting practice	PQS	SME	G
4	Consulting practice	PQS	SME	E
5	Consulting practice	PQS	Micro	F
6	Consulting practice	PQS	Micro	B
7	Contracting	CQS	Large	Q
8	Contracting	CQS	Large	K
9	Contracting	CQS	SME	A
10	Contracting	CQS	SME	J
11	Contracting	CQS	Micro	C
12	Contracting	CQS	SME	H
13	Academia	Academic	University	N
14	Academia	Academic	University	M
15	Academia	Academic	University	P

### 3.5.3 Revision and the Ratification of the Benchmark

The stages followed in the expert forum are given below:

1. Invitations to industry and academic experts to join expert forum.
2. Appoint the expert forum members.
3. Arrange and conduct individual expert forum interviews arranged to obtain views on revisions to the conceptual benchmark.
4. Collate views of the expert forum and develop the revised benchmark considering the average views of all experts.
5. Distribute the revised benchmark to all experts to obtain views on further revisions or concurrence with the revised benchmark.
6. Collate all further revisions to develop the ratified benchmark.
7. Convert the ratified benchmark to the final benchmark (GCTB).

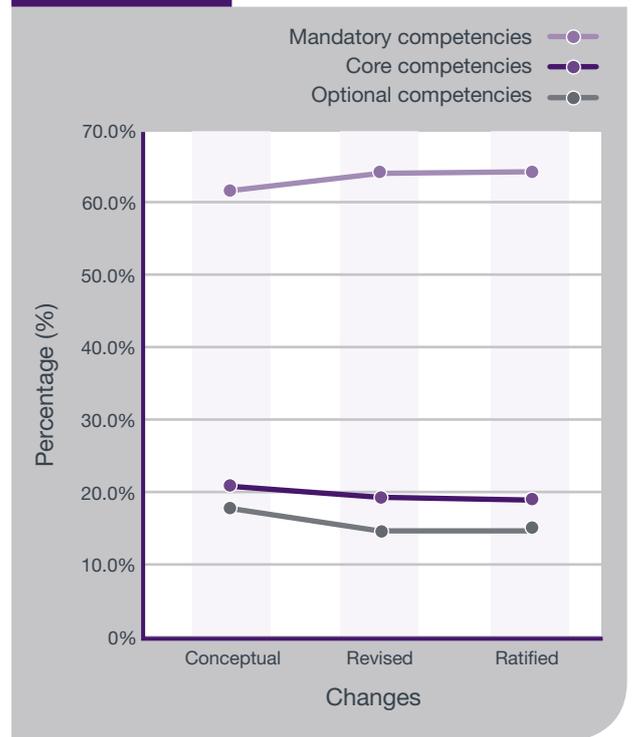
The details of how the revised benchmark values were developed from the conceptual benchmark are explained below. A similar pattern was followed for the development of the ratified benchmark values from the revised benchmark.

For the breadth scale, mode was used to analyse expert forum views. A competency consists of several topics. At Level 1, a topic under a certain competency can either be expected (i.e. by the experts) to be covered (i.e. marked as 1) or not expected to be covered (i.e. marked as 0), in graduate QS education. Same rules apply to Level 2 coverage. Level 3 is not considered because it is not a typical level of attainment in graduate QS education.

The mode of the 15 experts' views is then derived for each topic at both Level 1 and Level 2. For example, if 8 experts (hence 8 ticks) or more think that a topic should be covered in graduate QS education at Level 1, the topic is marked as 1 under Level 1, and vice versa. Same applies to Level 2 coverage. The number of topics covered under each competency, marked as 1, is then used to calculate the percentage coverage of topics for that competency, at both Level 1 and Level 2.

The average views of all experts were used for the depth scale. The experts were asked to amend the conceptual benchmark values i.e. credits hours to reflect the learning hours they think should be allocated to each competency in graduate QS education. The mean value of the 15 expert forum views on credits hours was then computed for each competency. The mean figure is converted to percentage score to illustrate the relative time proportion for each competency.

**Figure 2.6** Summary of changes to the benchmark



The Delphi technique (Rowe and Wright, 2001) was utilised to extract and harmonise the views of the experts. This enabled the researchers to achieve a consensus view from the forum to finalise the benchmark minimum levels of achievement of competencies for graduate quantity surveyors.

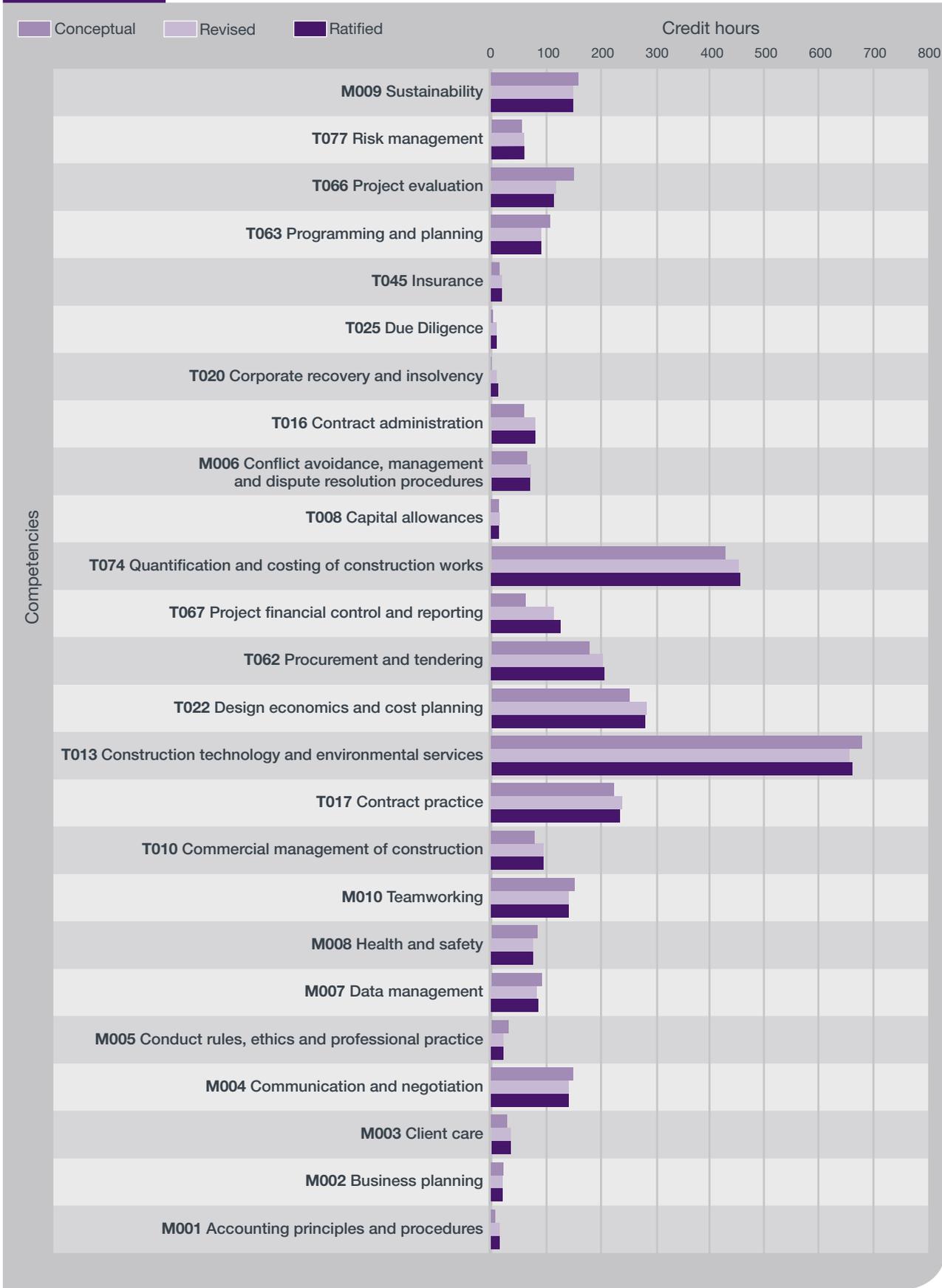
A comparison of the conceptual, revised and ratified benchmarks using the depth scale is presented in Figure 2.7.

It is clear that there were some changes from a conceptual benchmark to a revised benchmark but there were minimal changes from the revised to the ratified benchmark (final GCTB).

The changes to the benchmark through the revision and ratification processes are summarised in Figure 2.6. This indicates a slight increase in the weighting for core competencies and a corresponding relative decrease in mandatory and core competencies. This also reflects a 3% increase in the total number of learning hours from 3083 hours to 3188 hours.

**Figure 2.7**

**Cross comparison of ratified, revised and conceptual benchmarks for graduate competencies**



## 4.1 The GCTB – Final Benchmark

The final ratified benchmark with the dual scale breadth and depth mappings is converted to create the final Graduate competency threshold benchmark (GCTB). The full details of the GCTB are presented in (Appendix A). GCTB is a minimum threshold benchmark. Therefore it represents

minimum levels of competency achievement.

A summarised version of the final benchmark (GCTB) is presented in Table 2.5 below.

The benchmark is expressed in hours rather than in credits to enable each competency to be distributed and mapped against multiple modules (if required).

**Table 2.5 Summarised final benchmark (GCTB)**

GCTB		Depth scale		Breadth Scale	
Code	Competency	Learning Hours		% Coverage of topics	
		Ratified	Time %	Level 1	Level 2
<b>C1</b>	<b>Mandatory Competencies</b>				
C1.1	M001 Accounting principles and procedures	10	0.3%	80%	0%
C1.2	M002 Business planning	24	0.8%	100%	0%
C1.3	M003 Client care	36	1.1%	75%	50%
C1.4	M004 Communication and negotiation	138	4.3%	100%	88%
C1.5	M005 Conduct rules, ethics and professional practice	26	0.8%	64%	14%
C1.6	M007 Data management	82	2.6%	100%	71%
C1.7	M008 Health and safety	72	2.3%	100%	0%
C1.8	M010 Teamworking	133	4.2%	100%	75%
<b>C2</b>	<b>Core Competencies</b>				
C2.1	T010 Commercial management of construction	96	3.0%	100%	56%
C2.2	T017 Contract practice	243	7.6%	100%	43%
C2.3	T013 Construction technology and environmental services	660	20.7%	86%	0%
C2.4	T022 Design economics and cost planning	275	8.6%	100%	73%
C2.5	T062 Procurement and tendering	203	6.4%	92%	15%
C2.6	T067 Project financial control and reporting	121	3.8%	100%	30%
C2.7	T074 Quantification and costing of construction works	462	14.5%	95%	38%
<b>C3</b>	<b>Optional Competencies</b>				
C3.1	T008 Capital allowances	11	0.3%	58%	0%
C3.2	M006 Conflict avoidance, management and dispute resolution procedures	70	2.2%	100%	0%
C3.3	T016 Contract administration	81	2.5%	96%	9%
C3.4	T020 Corporate recovery and insolvency	10	0.3%	15%	0%
C3.5	T025 Due Diligence	6	0.2%	20%	0%
C3.6	T045 Insurance	13	0.4%	50%	0%
C3.7	T063 Programming and planning	97	3.0%	100%	50%
C3.8	T066 Project evaluation	118	3.7%	100%	77%
C3.9	T077 Risk management	58	1.8%	85%	54%
C3.10	M009 Sustainability	144	4.5%	100%	8%
	<b>Total</b>	<b>3188 hours</b>	<b>100.0%</b>	<b>305 topics</b>	<b>102 topics</b>

The percentage time allocation clearly indicates the relative importance of competencies in terms of learning hours that need to be spent at undergraduate level. The relative importance of competency categories is presented in Figure 2.8.

The overall levels of coverage of topics for mandatory, core and optional competencies are summarised in Figure 2.9. It is clear that most topics, especially for mandatory and core competencies, need to be covered at Level 1. There is a slightly higher coverage for mandatory competencies over core competencies which are expected at Level 2.

The depth scale indicates the minimum number of learning hours that needs to be allocated to each competency in a RICS accredited QS honours degree programme. The module specifications of such a programme can be mapped to the RICS QS competencies, identifying the learning hours spent for each competency. The minimum benchmark developed here provides a threshold minimum to achieve in this mapping (Figure 10).

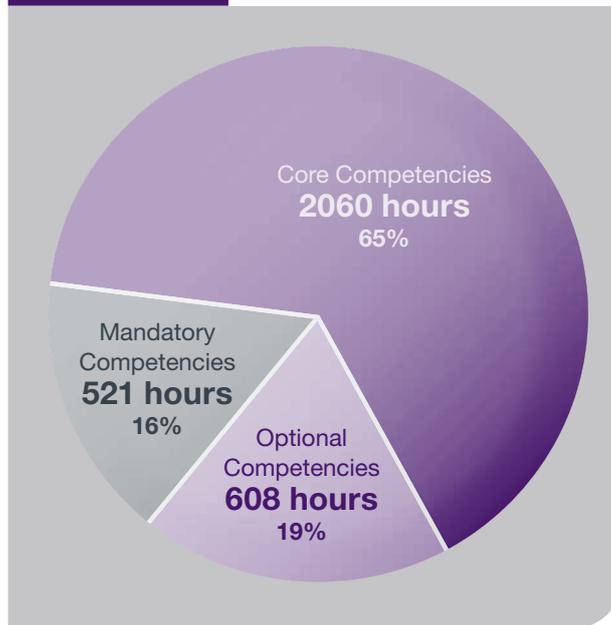
The breadth scale (Figure 11) in the benchmark indicates the expected percentage coverage of the RICS QS Study Check list (RICS, 2008a). The detail of which study topics need to be covered is indicated in the full benchmark presented in Appendix A of this report.

## 4.2 An in depth Analysis of the Benchmark and Expert Forum Perspectives

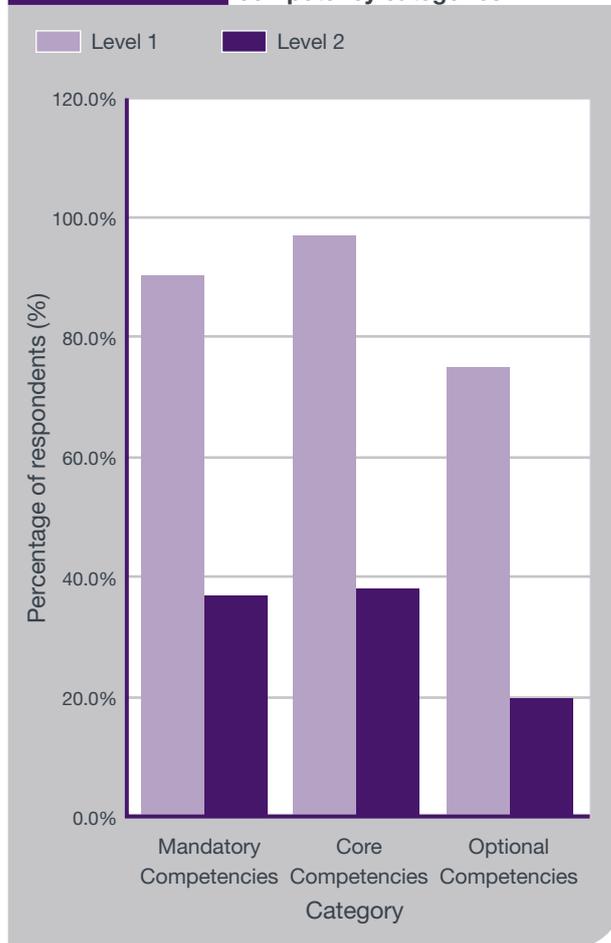
The expert forum consisted of 3 main groups of experts viz PQS, CQS and Academics. Figure 12 presents a cross analysis of these groups' views against combined views (Ratified).

It is clear that there is a minimal difference of opinion between these groups. Since all three expert forum groups have expressed similar views, this is reflected in the combined view expressed in the ratified benchmark.

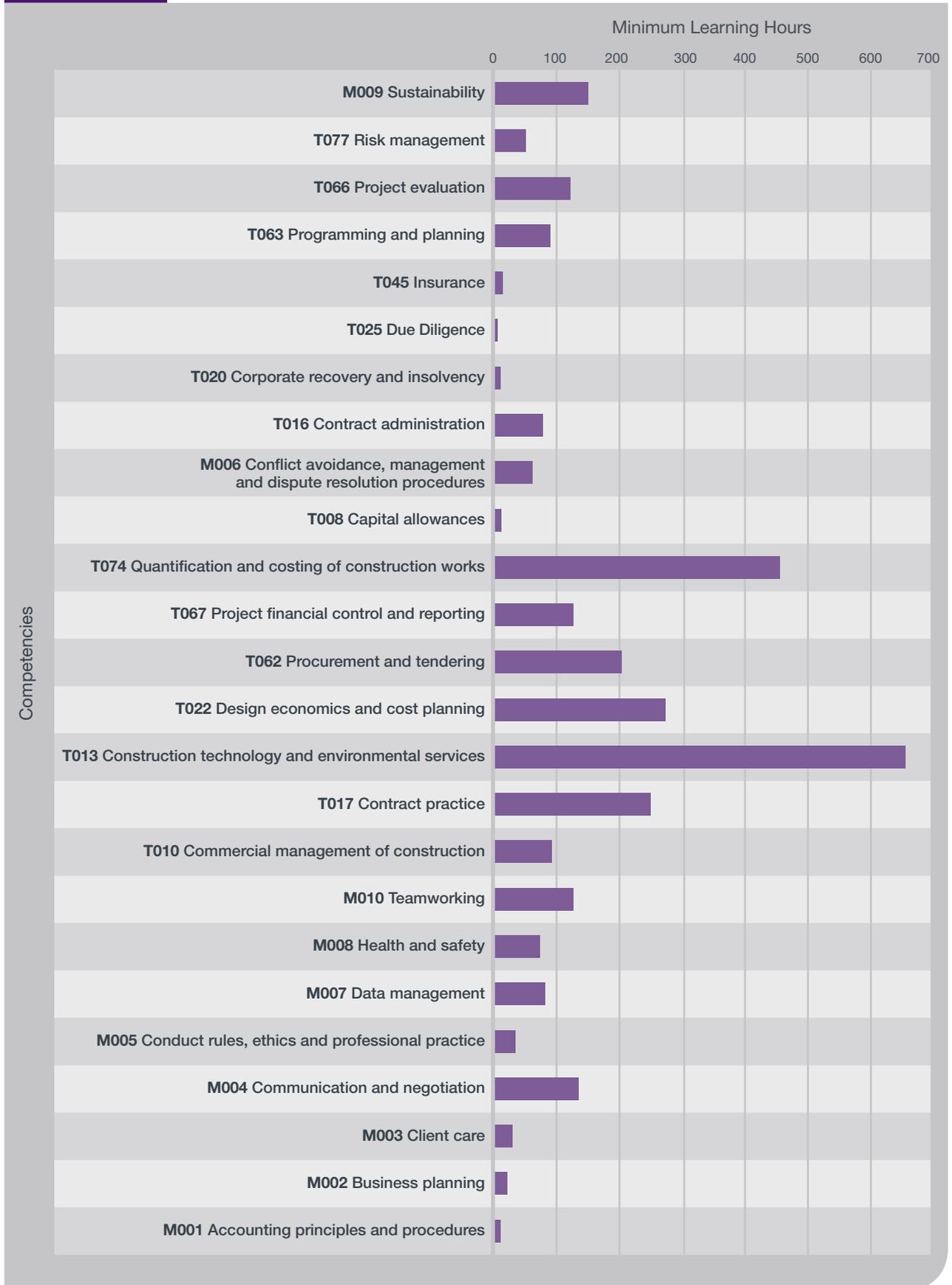
**Figure 2.8** Relative time allocations for competency categories



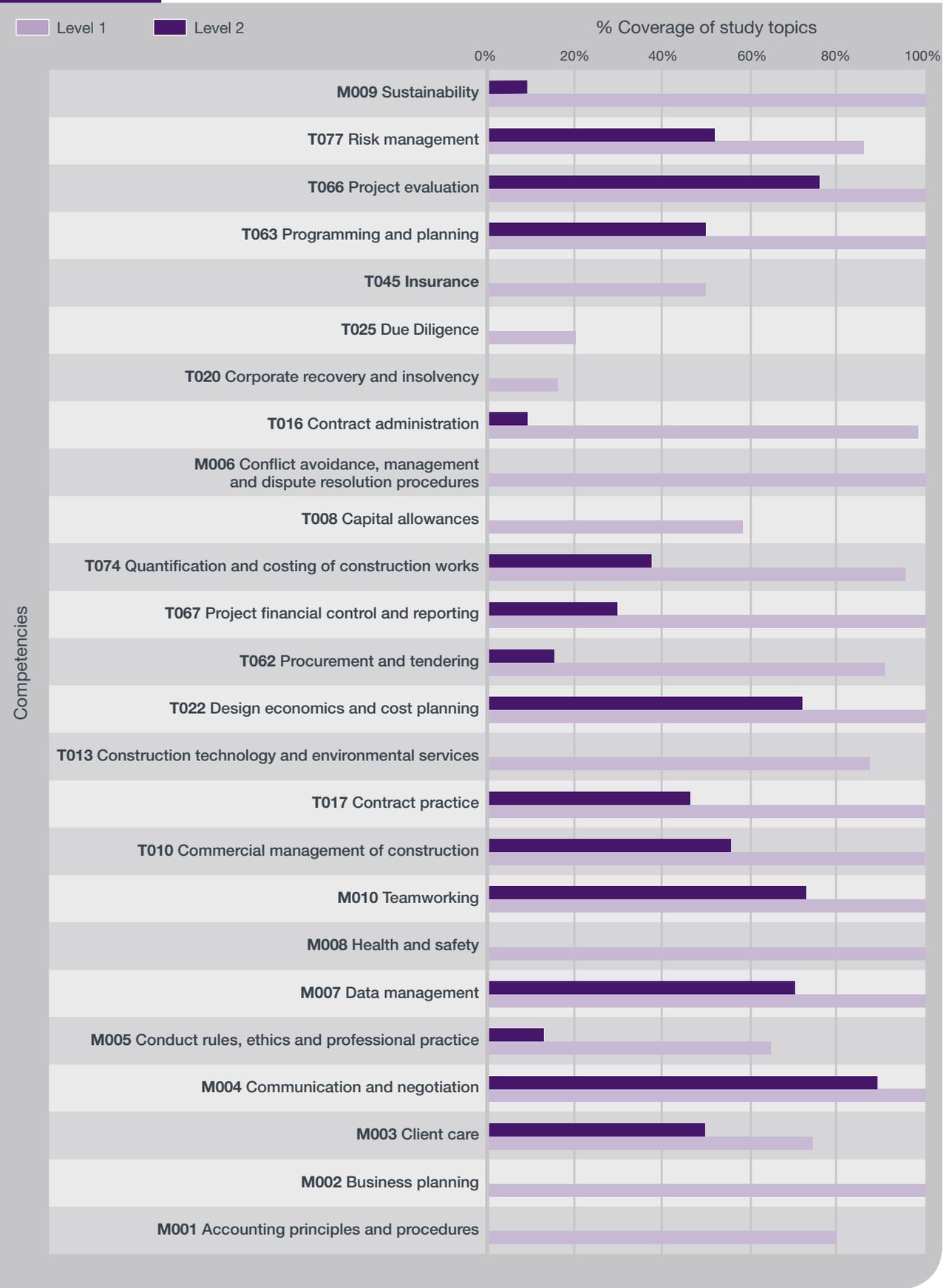
**Figure 2.9** Overall comparison of coverage of topics (Breadth scale) across competency categories

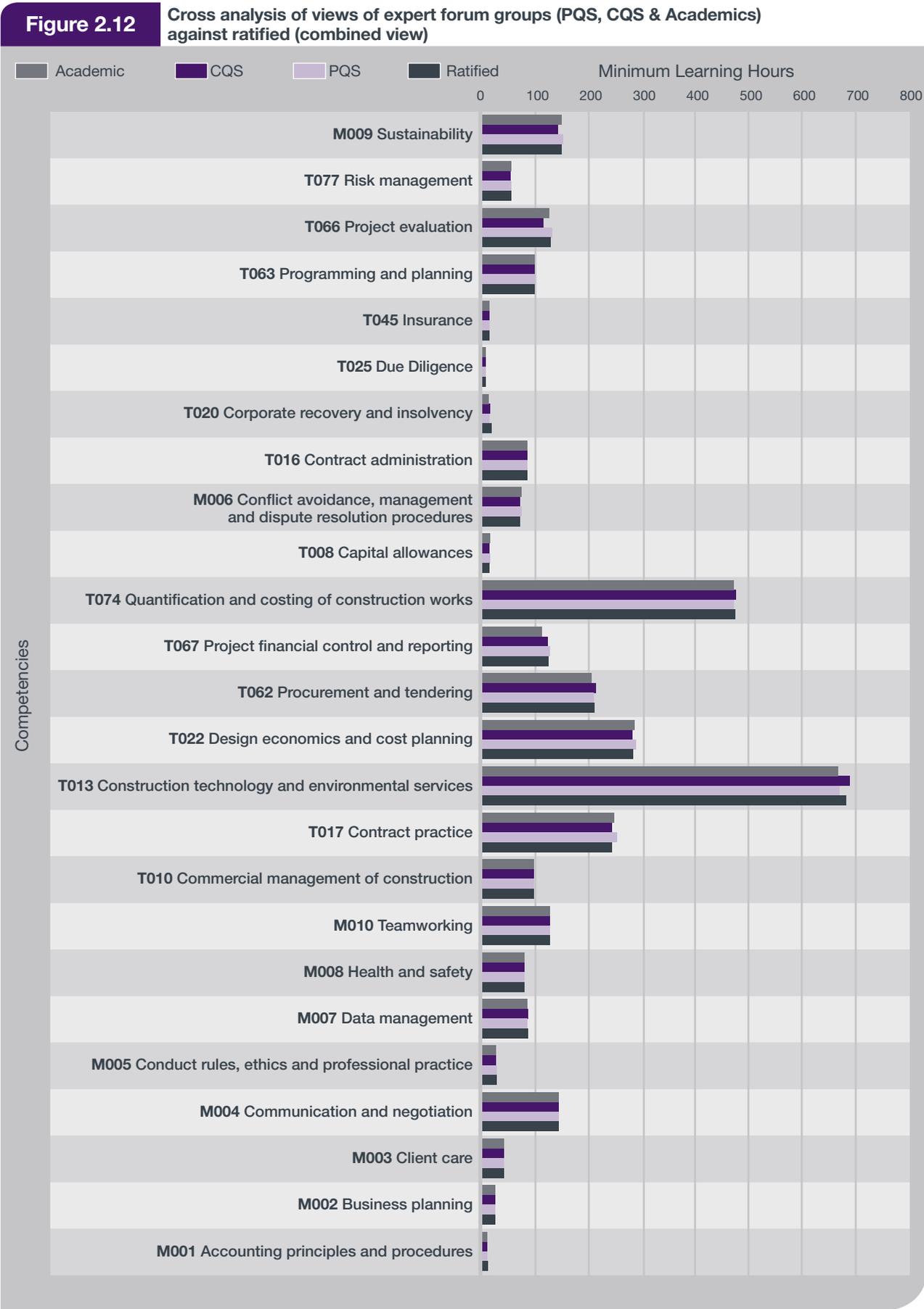


**Figure 2.10** Benchmark minimum learning hours – Depth scale



**Figure 2.11** Benchmark minimum coverage of study topics – Breadth scale

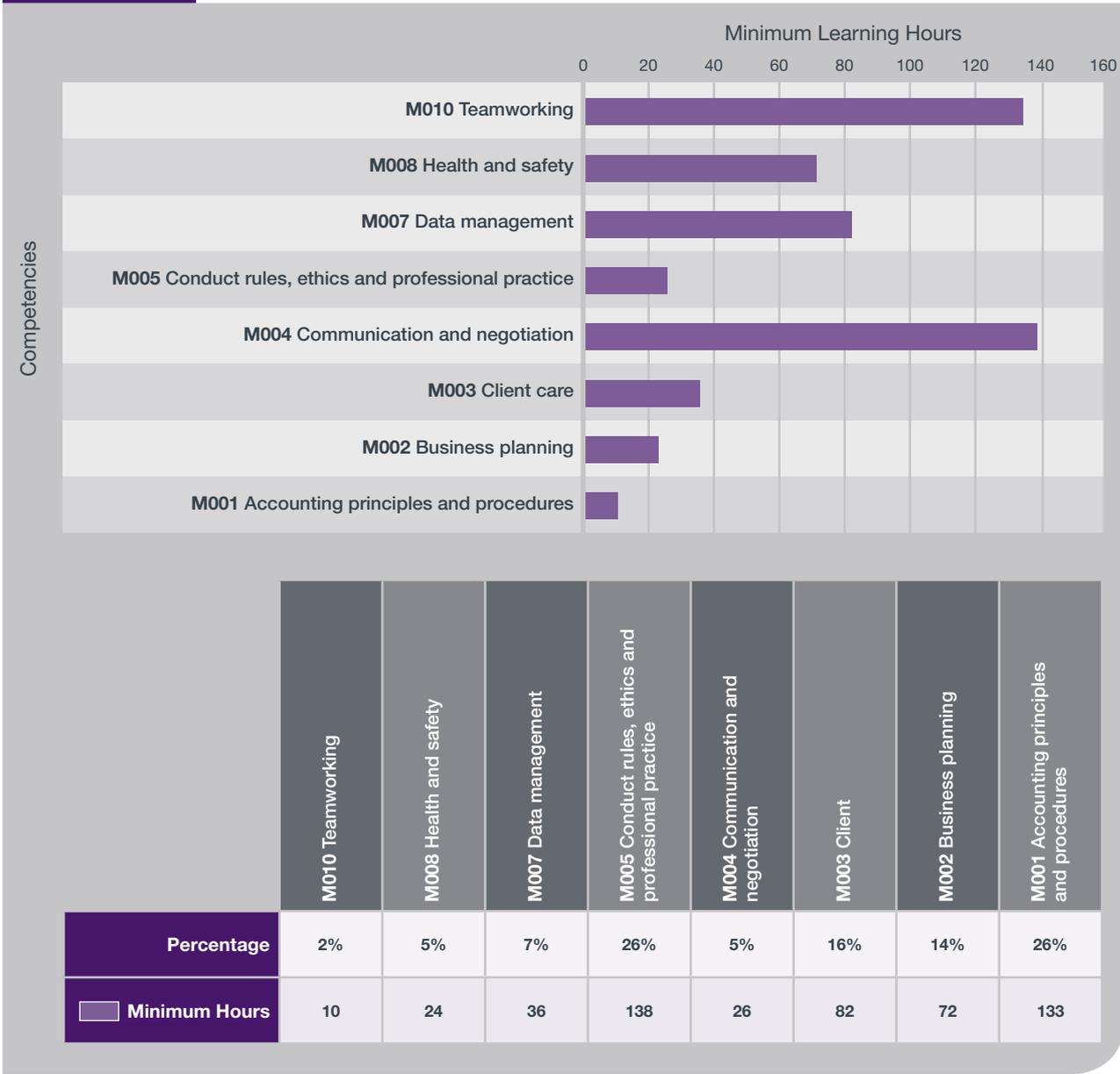




### 4.3 Analysis of Mandatory Competencies

Mandatory competencies are general competencies that are essential for the performance of the services of chartered QS. There are altogether 8 mandatory competencies, which are analysed in both Depth scale – minimum amount of time that a graduate should spend in learning aspects related to mandatory competencies and Breadth scale – the extent of coverage of competencies by study topics.

**Figure 2.13** Minimum benchmark learning hours – Mandatory competencies



### 4.3.1 Analysis of Mandatory Competencies by Depth Scale

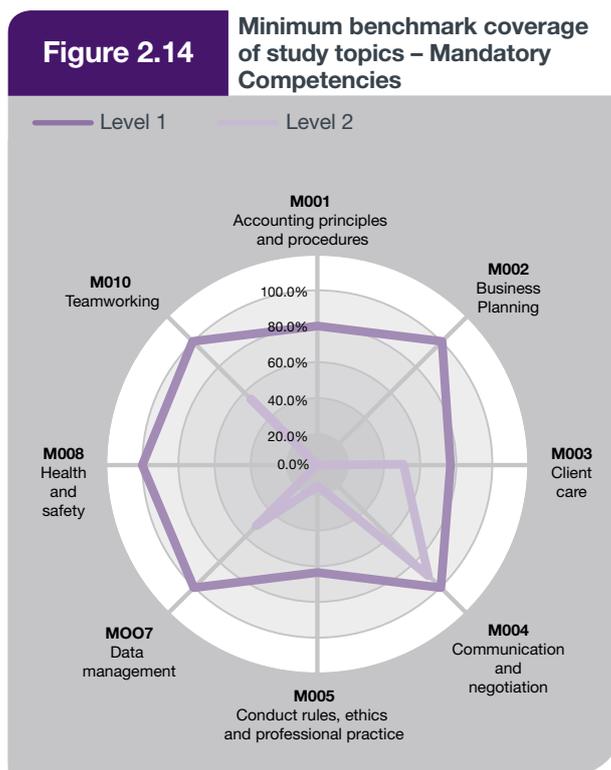
The 8 mandatory competencies are analysed in Depth scale (time spent on learning) in this section. Figure 13 illustrates the minimum study hours stipulated for achievement of mandatory competencies at graduate level.

M004 Communication and negotiation and M010 Teamworking are the two most important competencies and require over 130 hours (13 credits) of learning coverage. These two are followed by M007 Data management with 82 hours (8 credits) and M008 Health and Safety with 72 hours (7 credits). Other competencies are stipulated as of a very low level of importance.

### 4.3.2 Analysis of Mandatory Competencies by Breadth Scale

The expected coverage of study topics by respective competency is analysed in this section. Figure 2.14 illustrates the minimum coverage of study topics required for achievement of mandatory competencies at graduate level.

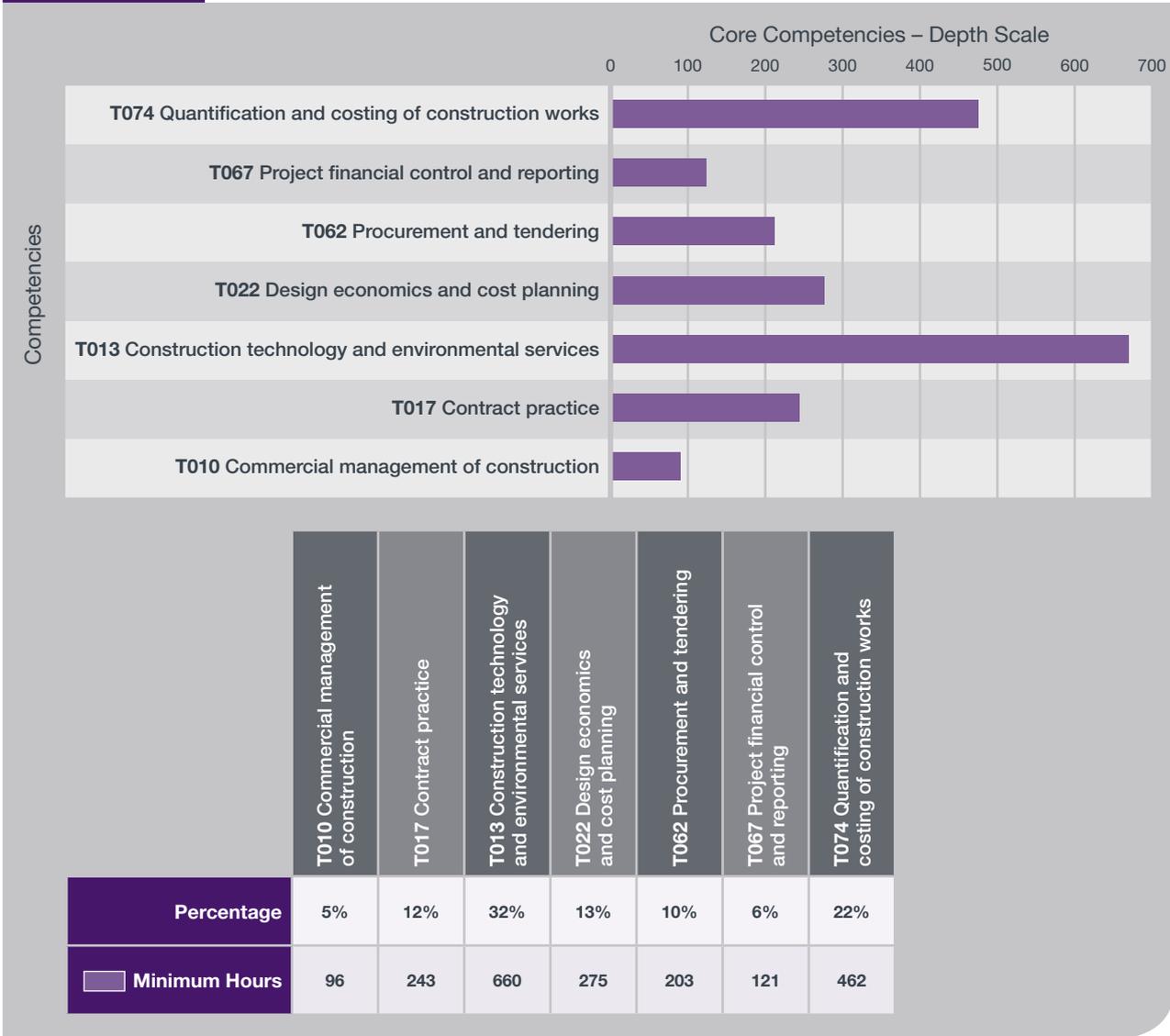
Except for M001 Accounting principles and procedures, M003 Client care, and M005 Conduct rules, ethics and professional practice competencies, full coverage of study topics in all other competencies are expected at Level 1. Coverage of topics at Level 2 is also expected for 70% or more for M004 Communication and negotiation, M010 Teamworking, and M007 Data management competencies.



### 4.4 Analysis of Core Competencies

The Core competencies are the most essential in providing QS services and signify core functions of the QS. There are altogether 7 core competencies that need to be achieved. These are analysed in both Depth scale – minimum amount of time that a graduate should spend in learning aspects related to mandatory competencies and Breadth scale – the extent of coverage of competencies by study topics.

**Figure 2.15** Minimum benchmark learning hours - Core competencies



### 4.4.1 Analysis of Core Competencies by Depth Scale

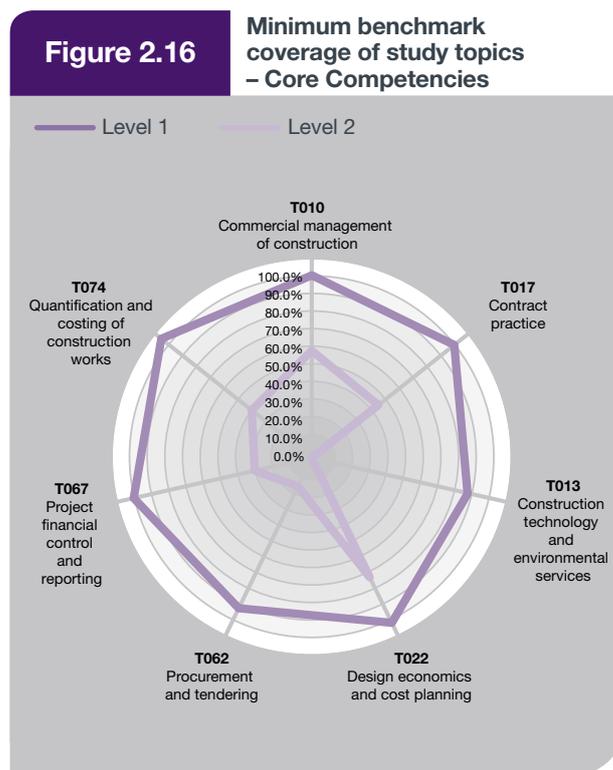
The 7 core competencies are analysed in Depth scale (time spent on learning) in this section. Figure 15 illustrates the minimum study hours stipulated for achievement of core competencies at graduate level.

T013 Construction technology and environmental services, is considered the single most important competence that needs to be achieved at graduate level education. It has a 32% weighting in time commitment, with 660 hours' time allocated for the competence. This equates to 21% (66 credits) of an honours degree programme. The second most important competence in terms of time allocation is the T074 Quantification and costing of construction works, with 462 hours (46 credits) of time allocation. It is followed by T022 Design economics and cost planning, with 275 hours (28 credits), T017 Contract practice, with 243 hours (24 credits) and, T062 Procurement and tendering, with 203 hours (20 credits). These levels of importance corroborate well with importance rankings in previous research (Perera & Pearson, 2011).

### 4.4.2 Analysis of Core Competencies by Breadth Scale

The expected coverage of study topics by respective competency is analysed in this section. Figure 16 illustrates the minimum coverage of study topics required for the achievement of core competencies at graduate level.

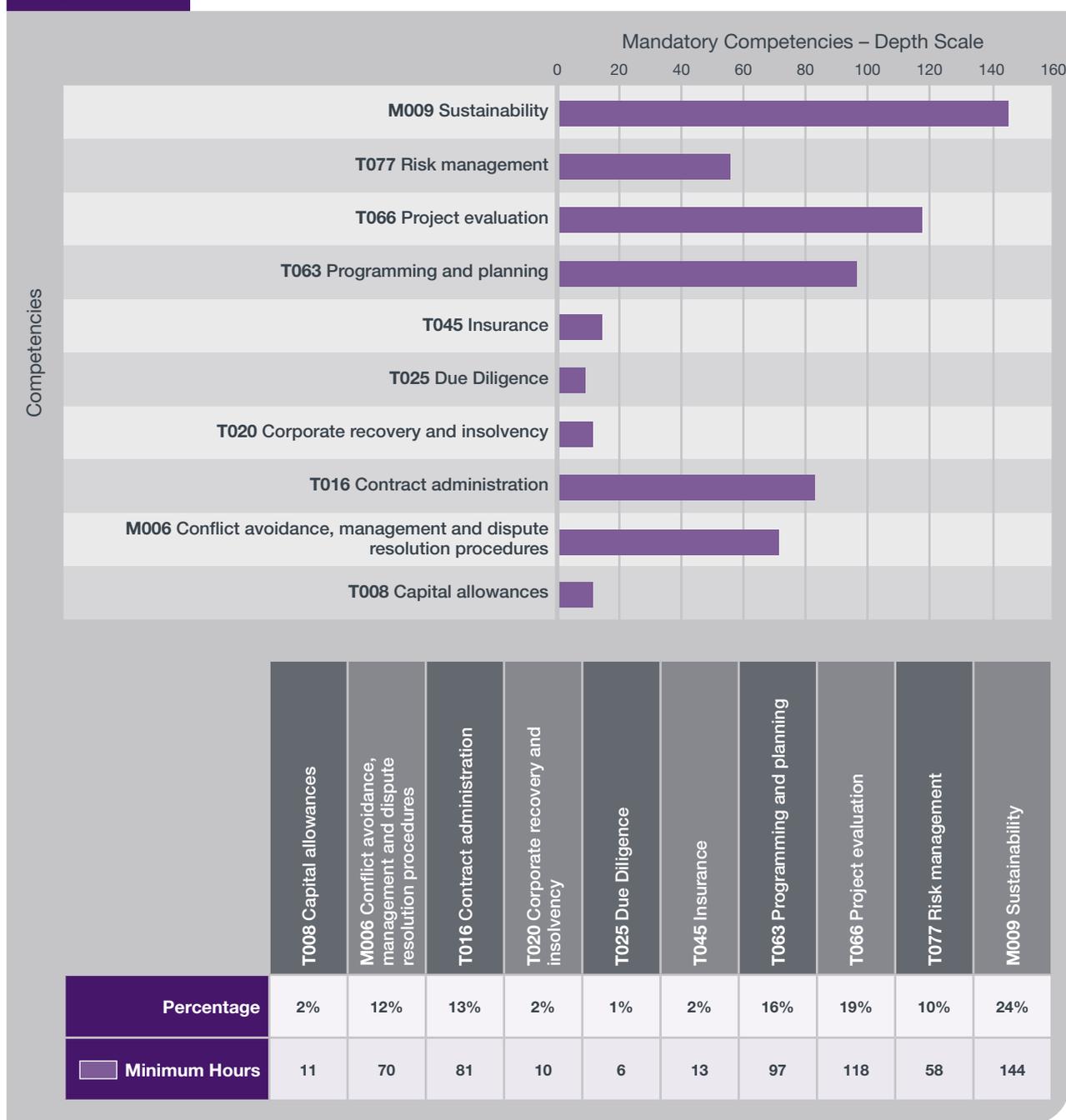
Almost 100% coverage of study topics is expected at Level 1 in all competencies except for T013 Construction technology and environmental services, T062 Procurement and tendering, and T074 Quantification and costing of construction works competencies. Even in these over 85% coverage is expected. At Level 2, over 73% coverage of topics is expected for T022 Design economics and cost planning, with the second highest on T010 Commercial management of construction (55%). This indicates that these two topics have the highest level of importance in terms of topic coverage. However, there is relative lesser emphasis on these two aspects in the Depth scale analysis.



## 4.5 Analysis of Optional Competencies

Optional competencies define the add-on and peripheral functions of the QS. These are important in expanding and providing modern QS services. There are altogether 10 optional competencies that need to be achieved. These are analysed in both Depth scale – minimum amount of time that a graduate should spend in learning aspects related to mandatory competencies, and Breadth scale – the extent of coverage of competencies by study topics.

**Figure 2.17** Minimum benchmark learning hours – Optional Competencies



### 4.5.1 Analysis of Optional Competencies by Depth Scale

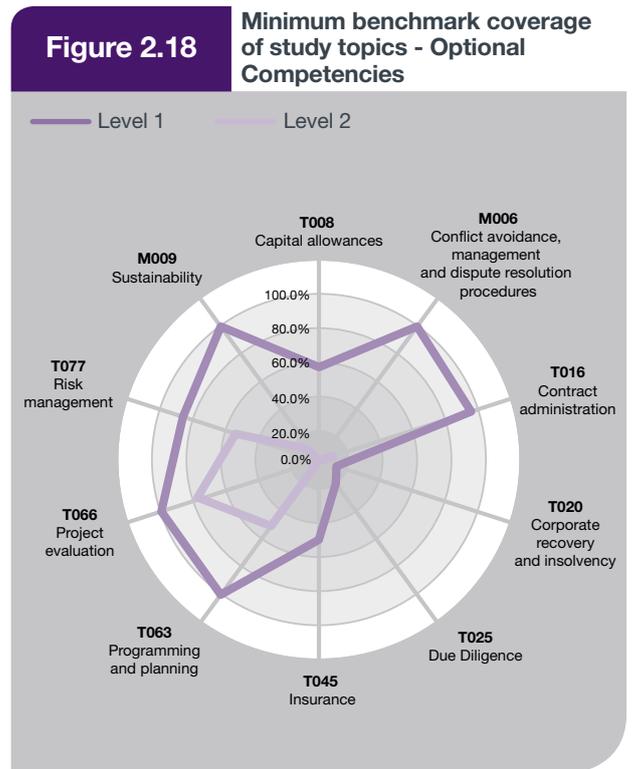
The 10 optional competencies are analysed in Depth scale (time spent on learning) in this section. Figure 2.17 illustrates the minimum study hours stipulated for achievement of optional competencies at graduate level.

M009 Sustainability, with 144 hours (14 credits) is the most important optional competency in terms of learning time allocation. This is followed by T066 Project evaluation, with 118 hours (12 credits), T063 Programming and planning, with 97 hours (10 credits) and T016 Contract administration, with 81 hour (8 credits). This is very much to be expected and mostly corroborates with previous research (Perera & Pearson, 2011). However, there are two main anomalies in that T016 Contract administration has been pushed down in importance.

### 4.5.2 Analysis of Optional Competencies by Breadth Scale

The expected coverage of study topics by respective competency is analysed in this section. Figure 2.18 illustrates the minimum coverage of study topics required for the achievement of optional competencies at graduate level.

At Level 1, there are three competencies that require coverage of topics at 100%. All other competencies require coverage at much lower levels. The competencies T063 Programming and planning, T066 Project evaluation and T077 Risk management, require over 50% coverage of topics at Level 2.



## 5.0 Competency Mapping Framework in the context of existing Processes

In this section, current academic and RICS processes and structures will be reviewed, in order to set the introduction and operation of the proposed benchmarking system within these. The review is based on an examination of available literature and interviews of three academics with extensive experience in QS programme development and management. The views of the interviewees are presented using numbers 1, 2 and 3 representing their respective views. The interviews were semi structured to enable free discussion but within the parameters of the report.

### 5.1 Programme Development and Validation

#### 5.1.1 Introduction

The current network of Quantity Surveying Degrees grew from the early 1970's with the move from Diploma to Degree level qualification for entry to the profession. The following examines the general processes required of those seeking validation of a new programme or re-validation of an existing, considering how a benchmarking system might be incorporated within this for the general regulation and betterment of standards.

The majority of the above degrees were delivered by the former Polytechnics, most of which, in turn, became New Universities in the early 1990's or thereabouts. With their conversion to University status came the right to validate and award degrees (previously validated by and awarded under the auspices of the Council for National Academic Awards (CNAA), to whom the former Polytechnics were answerable).

“Up until 1994, the RICS ran its own examinations, but since [then] there has been a progressive change towards qualification through accredited courses at undergraduate and postgraduate level” (RICS, 2008b). This process has recently changed with the introduction of the Assoc. RICS route.



## 5.1.2 Programme Development and the Validation Process

### 5.1.2.1 Programme Development

Any enterprise operating in today's competitive climate should constantly be reviewing potential markets for its products with a view to satisfying these and to long term growth. Academic institutions are no different. And so it is that those responsible for programme development will be on the lookout for appropriate areas of expansion. Provision must keep pace with the times, and adjust where possible to changing professional needs. From this comes the process of the review of existing programmes by programme teams and, from time to time, the creation of new ones. As seen above, this process, known as Validation, is now almost universally one which is internal to the university concerned. Very few, if any, degree courses in surveying are franchised, and even they will be monitored and sanctioned by a "parent" university rather than by the RICS itself.

### 5.1.2.2 Validation

"Validation is the act of academic approval by the university to confirm and verify an award in terms of the appropriate standard for the level of the award and the content as reflected in the award title ..." (Northumbria 2010). Based on one of the Universities studied, the following is an abridged account of the formal Validation requirements and procedures.

Validation will usually not come about except via a panel event, held within the School in question, for and at which all the relevant documentation will be considered. In the case of an undergraduate award the panel make-up will include a subject expert external to the university. In the case of surveying awards such an external expert will usually be a member of the RICS. In addition there will be a Panel Chair and two to four other internal panel members.

Documentation must include:

- Programme Specification – a comprehensive document presenting a contextual statement for the new course and covering its operation and composition precisely, including such matters as the delivery and assessment of each module.
- Full descriptive documents "Module Descriptors" will also be submitted for each new module associated with the programme. These last will each contain an outline syllabus, learning objectives, the proposed assessment rationale and a detailed split between class contact, directed learning, private study and assessment.

No Validation will be approved without the full satisfactory presentation of all documents, together with the execution of any corrections or amendments recommended by the School panel. Thus, quality standards across the School can be upheld, and all will be in line with university guidelines.

In the case of a new programme the proposal to develop such materials must be sanctioned by the relevant sub-committee of the University Learning and Teaching Committee. This will take into consideration overall university policies and guidelines regarding funding, resources and long term academic strategies. Only with and after the approval of this Committee can development go ahead at School level.

Stage Two of this process sees the first introduction of detailed proposals, created by course teams – the Programme Specification and other necessary documentation.

### 5.1.3 Interview Analysis

Interview responses all essentially illustrate and support the suggestion that Validation is a process internal to the University, one over which the RICS has no real control. The nearest that they come to having influence is through the external expert, who will tend to be a Chartered Surveyor attached to the discipline to which the programme relates. One interviewee (1) did liken the accreditation process (see Section 5.2, below) to “validation at course level”, for here the RICS can have some say over the continuation or otherwise of a course. Another supported this understanding;

*“[RICS] is not directly involved in the validation process within the university but they are part of the process ... under the banner of our partnership meetings”<sup>3</sup>.*

Two of the interviewees gave lengthy and detailed accounts of the processes operated within their own universities to achieve and maintain certain quality levels across their courses, both much along the lines of the above.

*“There’s a standard procedure and whole list of documents actually produced, which evaluating the rationale for this ... for the new course, providing [a] resource document obviously, proposing ... an overall structure and ... content, its curriculum and its modules and maybe writing quite a few new modules if it’s quite a new course ... one of the things we do in terms of validation is prescribe to a certain format... the university requires us to put together an number of documents ... we will have somebody who will be from another university or from practice”<sup>2</sup>.*

Both cases served to illustrate that rigour is applied, again as suggested by the example detailed above. Interviewees seemed satisfied in broad terms with the processes concerned, together with the part which they, colleagues and others played in it. Reference was also made to Periodic Reviews.

*“At university level we have ... every 5 years we have a review of specific programmes where they come in and there’s internal and external people involved in the visiting panel. They’ll be coming and look over all the content of the course ...”<sup>1</sup>.*

These are held by all the Universities (usually on five yearly basis, as suggested), a further check on the maintenance of standards.

One interviewee, remarking in fact on benchmarks and what they ought to cover (but confusing these perhaps with thresholds) suggested that the RICS;

*“should look at how many members of the academic staff are members of the RICS ... because if you’ve got academic membership staff, members of the RICS, they understand the competencies which they feed back into the course developed”<sup>1</sup>.*

### 5.1.4 Further Development

The RICS does not have direct influence over the actual award of degrees themselves, lost to it essentially with the granting of degree awarding rights to the New Universities. The degrees, together with the broad outline of their respective validation processes have an ever increasing role to perform. The RICS will have to work through and around the existing structures, exercising such influence as they can through external subject experts, external examiners, academic staff who are members, and the like.

As is suggested above, new developments (or fundamental changes to existing provision) arise out of perceived demand and first see light within a School and/or subject group setting. That is, they are born of academics who are associated with the discipline. These academics will be guided by subject experience, which should include influences from professionals and professional bodies with whom they are in contact. They should also draw on, and be guided by; any documentation produced by the professional body, in this case the RICS, from who they receive accreditation. This last may afford the opportunity for the introduction into the customary documentation the proposed GCTB perhaps as a part of the Programme Specification or as integral part of the set of programme validation documentation.

### 5.1.5 Summary

Validation is, essentially, a private, in-house process, one in which the RICS has no specific involvement and over which it has no direct power. However, there is nothing in university regulations to prevent academics responsible for the design of new programmes/courses, and external subject experts party to the validation process (who in most cases will be themselves be members of the RICS), from heeding and being guided very specifically by benchmarks. Equally, as part of their documentation, universities declare their wish to be guided by good practice from industry. In due course, benchmarks such as those proposed and created as a result of this research may be regarded as embodying good industry practice. In due course the requirement for adherence to such benchmarks may become embedded in the paperwork without which no programme submission will be considered complete.

## 5.2 RICS Programme Accreditation

### 5.2.1 Introduction

Accreditation is closely tied in with, and monitored through, the RICS. The RICS – University Partnership Process, (see Section 5.3, below), as the two are virtually synonymous. Accreditation, once achieved, is reviewed through the media of the Partnership.

### 5.2.2 The Accreditation Process

As noted above, the majority of Quantity Surveying (and others surveying related) degree programmes are now quite long established, and the chief requirement appears to be that these continue to meet certain thresholds through certain specified reporting requirements. These last are tested through the report submitted at the time of the Partnership meeting.

In the case of new programmes seeking accreditation for the first time, or those seeking re-instatement, the requirements are set out in some detail in the document entitled “Policy and guidance on university partnerships” last published in April 2008 (RICS 2008).

The above document stipulates 18 sets of course details that are to be submitted for scrutiny, ranging from general course rationale and philosophy through to support resources. It gives curriculum guidance, but in very generic terms, chiefly through references to APC Mandatory, Core and Optional Competencies. There are no specific syllabi, benchmarks or the like adding further detail or measures to these requirements. Indeed, the document specifically states at one point that the

*“RICS is not prescriptive in terms of course design. It positively welcomes a diversity of provision” (RICS 2008b).*

This relatively “light touch” approach deliberately intends to encourage

*“Universities with appropriate expertise, skills and resourcing ... to design courses to their particular strengths” (RICS 2008b)*

However, it could be suggested that there is a need for greater consistency across curricula, where professionals have shown some dissatisfaction with graduates’ ability to exercise Core Skills and others (Perera and Pearson, 2011). Although flexibility to design unique programmes is encouraging, the lack of a minimum benchmark in achieving graduate level competencies removes the ability for the RICS to ensure at least minimum standards are met.

At present, the chief and only precise numerical measure of courses and thus their potential for producing effective surveyors appears to relate to entry qualifications. Here, a specific formula is stated; an average of 270 UCAS points across the top 75% of applicants or a minimum of 230 for any one applicant, a factor which each university may choose for itself. However, in recent communications from the RICS it appears that this threshold in entry criteria is to be removed as well.

### 5.2.3 Interview Analysis

#### 5.2.3.1 Accreditation generally

All three interviewees agreed that accreditation is important for their courses. It is a good market selling-point as one of the reasons why students join the course, because they want to be ‘RICS’ members.

*“I attribute it [success of the course and conversion to membership] to the fact that our students come to our courses with the RICS membership as an objective”<sup>2</sup>.*

For this reason it was suggested that accreditation should link course contents more closely to the competencies, but, significantly, we feel, with some consideration of Industry requirements.

*“I think it (accreditation) should be linked to the course content and competencies. But it should also be linked to the input that is coming in from the industry”<sup>1</sup>.*

Interviewees were questioned as to the relationship between their approach to course design and assessment in the light of RICS policy and guidance. Nobody considers their own university to be operating in conflict with these.

One interviewee suggested that there must be an appropriate balance between coursework and exams. The interviewee suggested that courses should have more formative assessment than summative assessment. Others agreed;

*“We need to try to have a balance between coursework and exam. So we would have more formative assessment happening throughout the courses leading up to the exam that’s happening at the end of the semester. But students are still getting the feedback. They’re still getting encouragement of learning and development of knowledge and understanding. But the final assessment happens at the end by an exam”<sup>3</sup>.*

This, it is suggested, reflects RICS policy.

### 5.2.3.2 The introduction of benchmarking – in principle

Interviewees were also asked their views, in the context of accreditation, towards the introduction of an exit-related benchmark, the testing of which would form a part of the accreditation and thus the partnership process. Responses were mixed. In one case there was outright support, the only reservation being that courses should still be allowed some scope for specialisation where appropriate.

*“I absolutely support benchmarking ... what it is you expect a graduate to do by the end of the course ... there should be some set of skills that we should all be aiming for the graduates to do by the end of the year ... I think students should have the knowledge of what the core competencies are by the time they leave the university”.*<sup>1</sup>

*“Yeah, I think it (benchmark) is useful. I think you have to be clever in what the benchmark is. And it’s something that [must be] understood and can be applied by all universities”.*<sup>3</sup>

This is, in principle, agreement with the benchmarking. However, there were occasions where more caution expressed over its design and/or implementation.

*“I wouldn’t be particularly happy with that .. because I think it goes down the CIOB approach ... and APM ... I am a bit cautious ... because I have a feeling it tends to produce [a] homogenous product. [and they] end of being very, very similar, which of course is the objective, isn’t it in a way?”*<sup>2</sup>

The interviewee previously expressed dissatisfaction over most other institutions adhering to a rigorous regime of quality control. He felt these resulted in more paper work and difficulty in administering programmes.

*“I do have another problem with benchmarking using words. What does that word mean?” We’re making benchmark statements. The external examiners have got to confirm that you meet some benchmark. I mean how do you prove that, how do you? ... Any benchmark which is essentially based on words is by definition very subjective ... and even [in the] external examining process, two examiners might say two different things”*<sup>2</sup>

*“I think it’s not right .. the QS have got some indication as part of their APC, a guidance of what to expect of a graduate. The problem is, how do you measure... ?”*<sup>3</sup>

*“The more prescriptive you are, I think there’s a danger you become more of an HND than a degree, because of what a degree should really be about.”*<sup>3</sup>

The proposed benchmarking system does not make a degree more prescriptive; rather, provides a structure and a system to self-evaluate the level of compliance with RICS competencies. It does not bring a quality of a degree down; on the contrary quality standards are further pushed upwards. The aim is to harmonise the quality of a graduate with industry expectations and standards.

*“... the problem is that if you want benchmarks, you may have to have less competencies. The more competencies you have the less you can be prescriptive ... the whole point about that degree is not just teaching. It’s about the student developing”*<sup>3</sup>

The level of quality of a degree can be assessed by numerous indicators. Employability of graduates is one key indicator. The proposed GCTB aims to improve employability of graduate by making them more industry relevant and professional.

### 5.2.3.3 The introduction of benchmarking – content / coverage

There was some discussion here, partly in the light of the above, of what topics should or should not be included within the Core Competencies, and, by implication, benchmarks. This was set in the context of the allocation of the overall delivery and assessment time of 3,600 hours, a figure common to most degree programmes though increased in Scottish universities. This reflects the need, as seen by certain academics, for the delivery of certain “basics” without which the students’ education to higher levels could not be undertaken or which, at a higher level, were thought an essential part in basic teaching but which did not feature in RICS competency study checklist.

*“ ... an employer would look at that and expect the graduate to come out and be able to meet the competencies of the RICS”.*<sup>2</sup>

*“we’ve been quite aggressive in making sure that the students understand the context, they understand what they’re being taught and how it’s covered with the APC.”*<sup>2</sup>

*“I think there’s a requirement to have core competencies, but those also I think are requirement for the student to understand why they’re studying it and why it’s relevant to their profession career they’ve selected.”*<sup>1</sup>

Generally it was agreed by interviewees that 70-80% of the 3,600 hours (2520 – 2880 hours) should be dedicated to RICS Competencies. In practice, it appears that the average expenditure of hours on RICS competencies amounts to 3083 hours (85%). See discussion of these figures in section 5.4.1. below.

*“And a lot of it is coming back to knowledge of construction, construction technology of residential and commercial buildings from which there’s a greater understanding and building on how you estimate, how you measure. So, I think 70 to 80 is fine.”*<sup>3</sup>

Some proportion at least of the 20 or 30% not devoted specifically to RICS Competencies might feature the unique flavour of the specific course. This last, presumably, would have to cover Mandatory Competencies at least.

*“... that 20% or 20 or 30% allows the student or allows the course to give a slightly different flavour. And I think that flavour would depend upon (a) their region. Let’s say, for example, us being based in \*\*\*\*\*. We’ve got lots of global, commercial firms which we have to provide that sort of client focus, the client understanding. Then that 20 to 30% allows us to give flavour really.”<sup>3</sup>*

Such variations from the “norm” as envisaged by the RICS must give rise to negotiations if there is to be acceptance of the benchmarking system. They mirror, in part, certain discrepancies between the RICS Competencies and the core skills of the modern QS as identified by some members of the Expert Forum group.

## 5.2.4 Further Development

It would appear that the existing framework for the design and operation of courses is mostly operating to the satisfaction of the academics. This is partly because there is full freedom for them to decide on curricular content and method of delivery with hardly any imposition from the RICS. Unlike other professional bodies, there is hardly any intervention or requirement by the RICS to bind them to a mechanism of systematic checking. A change, incorporating exit –related benchmarks can only come about through co-operation between the parties. The GCTB is a key component of the CMF which aims to provide a mechanism to systematically incorporate RICS competencies in RICS accredited QS degree programmes. The CMF will only be successful if it comes through the RICS as a mandatory requirement for RICS accredited programmes. The process would involve greater level of cooperation from the academics. In the face of current economic crisis this would be an important change that the RICS and universities need to embrace to make graduates more industry relevant.

## 5.2.5 Summary

Accreditation, it has been shown, is the chief remaining point of control or influence offered to the RICS. Being centrally managed by the Institution it still offers the opportunity for standards or “benchmarks” to be set and to some extent imposed upon programmes at university level.

One of the interviewees in particular expresses concerns lest the benchmarks be too prescriptive, involving the use of wording open to different interpretations by different parties. In practice, the benchmark which we propose is something numerical, a “yardstick” against which the curricula of different courses can be measured. Like all quantitative measures (allowing reasonable margins) this must be less open to misinterpretation than a qualitative write-up of desirable provision.

## 5.3 RICS University Partnership Process

### 5.3.1 Introduction

For those academic institutions currently accredited by the RICS and therefore operating within a Partnership agreement, the continuing Partnership manifests itself through a fairly informal, essentially a “light touch” process. The principal interest and intervention on the part of the RICS is targeted at any proposed new programme or programme development(s) put forward by the member institution.

Reports on student numbers, progression, etc. (addressing “RICS partnership thresholds” – related issues) are submitted, but there is rarely any detailed scrutiny of Module content unless, as suggested above, some change or development is proposed

### 5.3.2 The Partnership Process

The outward form which partnership agreements and monitoring takes is through the annual partnership meeting; for these the agenda is essentially a standard one, as noted by interviewees. Exceptionally there may be a modification relating to issues specific to the institution under scrutiny.

The process is essentially one of on-going review and monitoring. The only specific point of measurement and/or control over programmes, linked directly to their continued accreditation, relates to “threshold standards”.

Currently, although these are under review at the time of writing, these are requirements for reporting in three areas;

- Numbers and qualifications of entrants to programmes of study. These should comply with the average or minimum requirements, 270 or 230 UCAS points respectively,
- Numbers of most recent graduates. An earlier requirement regarding their destination has been removed,
- Research activity within the academic department in question, and its relation to delivery and assessment.

It appears that there are no “internal” guidelines held or followed by the RICS team on the Panel. This was stated in a conversation with a key member of the RICS Education Committee and has since been confirmed by one of the current interviewees.

*“I don’t think there is anything written down, but we did ... have a meeting ... and we spent a bit of time ... discussing the role of the person involved as a Trustee” (1)*

Therefore, the content and structure of any meeting will indeed be much as set out in the above agenda.

### 5.3.3 Interview Analysis

#### 5.3.3.1 Process

Generally speaking, interviewees were supportive of the partnership process, as they were partnership meetings.

*“Really, the partnership meeting is the topping of the icing on the cake to make sure we’re doing the right thing and everybody is informed.” (3)*

However, it could be read from this that there is a danger of such a meeting being seen as something of a mere formality, particularly if/when a programme is seen as performing adequately. One respondent, perhaps with something like this in mind, did query the necessity for this to take place on a yearly basis.

*“I think because it happens so regularly, every year ... you have to ask, why does it happen every year?” (1)*

Others may welcome this face to face contact with the RICS, seen by some as an increasingly distant body (Perera and Pearson, 2011). As one interviewee remarked;

*“I think the further away you are from the source of information, the less you can be influenced or influence that. So, I think the Partnership meeting is a good way of sort of hitting a milestone in a sense”. (2)*

It was agreed that the agenda was standard one, but it was not felt to be too prescriptive;

*“... in the sense that the agenda for this partnership meeting is jointly produced, then I mean I would imagine that if we had something that we wanted to talk about, we would just put it on the agenda”. (2)*

It was noted that the Partnership meeting could act not just as a check on process and outcomes but as a spur to the development of new courses and course materials.

*“An example ... where the RICS have asked us to be proactive in developing a course” (3)*

#### 5.3.3.2 Expanding the brief

There was some suggestion that by spending as long time as they did discussing thresholds, in particular those relating to entry, the relatively limited meeting time was not being put to best use;

*“There are other things the RICS could be doing to look at courses and how we link work with curriculum; how we link the co-industry works and how we link with competencies as opposed to spending however many hours it takes to show us [RICS] what entry qualifications your students have got”. (1)*

*“I think this year they’re going to be talking to us about threshold and whether they’re going to changing. And we also talk about External Examiner comment report. That’s generally what we talk about”. (2)*

*“... you only see them for 3 or 4 hours. So there's not much you can necessarily develop”. (3)*

There was some suggestion that links with the local RICS establishment could be stronger and that there might be some overview of these through the Partnership process.

*“... so there's not a lot of discussion happening during that and I think that's a bit of a shame because I think that's where the partnership could actually work quite well between the university and the professional body to get the courses marketed and the events marketed and student networking opportunities, that kind of thing”. (1)*

*“It's their concrete contribution to this department in terms of providing people, mobilising local RICS resources and that sort of stuff, which would be a useful thing to talk about each-each year to review I think.” (2)*

*“I think the issue of what the RICS actually does, you know, is an issue which should be more prominent on the agenda”. (2)*

Interviewees suggested that there must be a different (perhaps better?) format by which to communicate between RICS and Partner University. Two of them suggested moves to improve the communication at local (regional) level. Another interviewee recommended that there should be some RICS representative to talk with students at the induction day, provide more local resources.

But to counter this, one interviewee made the point that they [his university] were pretty good at discussions with the RICS outside the Partnership meetings. Certain academic staff had been, or were, members of Regional or National Committees and the like.

The one interviewee involved with a number of Panel Meetings from an RICS perspective made the point that what is sought of Universities generally is consistency. Referring to National Student Survey (NSS) scores, a factor which is examined at the Partnership meeting;

*“Not the “be all and end all”, but ... being used to benchmark universities ... and the main thing is to have consistency”. (1)*

## 5.3.4 Further Development

Traditionally, the main thrust of the Partnership process and thus, generally, partnership meetings avoid specific examination of course content or the level of attainment of the student cohort in these, except in exceptional cases where issues have been identified by External Examiners.

As noted elsewhere, the main thrust behind the current research has been the development of a set of benchmarks relating to graduate capabilities. It would seem that this must form a positive compliment to existing thresholds, marking a move away from entry-level scrutiny and approval towards something relating more usefully to actual course content. There are gaps between the perceptions of academia, industry and the Institution as to what should have been and what has been achieved through the education process leading to a first degree in any of the surveying disciplines – we have focussed in specifically on the area of Quantity Surveying (Perera Pearson, 2011). As witnessed by the chief nature of the current “thresholds” referred to above, the RICS has traditionally concentrated on performance measurement from an “entry perspective” (UCAS points) rather than exit – the capacity of the graduate. Benchmarks offer the opportunity to redress the balance.

As seen from the agenda reproduced above, and the observations made by interviewees, the meetings between the RICS and academic institutions are rather formulaic, and may not always respond to specific local needs. A review of local RICS interventions and/or support would seem to be a welcome.

The meeting relies on review of a certain body of paperwork prepared and submitted to the RICS prior to the meeting. It would seem a reasonably easy task for one or more of the course team to complete an annual paper exercise checking course content against the benchmarking document (producing a competency mapping record – CMR). If there is no change in the programme content producing or updating the CMR would not be required. This having been done, any wide discrepancies between the two could be swiftly and easily focussed on at the meeting and appropriate discussion and decision making follow.

## 5.3.5 Summary

The Partnership process, it is suggested, should be refined to take account of a benchmarking exercise, the review of which should be a feature of annual review to produce a programme specific CMR alongside other documentation submitted to the RICS and upon which the latter bases its assessment of the appropriateness, or otherwise, of course provision and standards of attainment. Accreditation, which runs hand in hand with and affords Partner status, should be informed by the outcome of benchmark review and updating.

## 5.4 Discussion

Partnerships between the RICS and those who award its accredited degrees are seen as a good thing in general, although there may be disagreements over the frequency and mechanics of the annual meetings. These last do at least provide a face-to-face forum for the parties chiefly involved, which most welcome.

### 5.4.1 Benchmarking; the ideal

In terms of the measurement of the capabilities of graduates and thus the suitability of the accredited degrees from which they issue, it is perhaps time to move away from an entry-related threshold for potential students to an exit-related threshold for potential members. This could be provided by benchmarking which would afford a certain uniformity of standards. This would remove the large knowledge and understanding gap which seems to exist in the measurement and quality control of the potential professional member, between their first entry onto an Accredited Degree programmes and their arrival for APC assessment some five or six years later.

It seems that if the benchmark (GCTB) is to meet with approval both of the RICS and of academic providers it must avoid wordy passages, open to varying interpretations, being instead a numerical measure of some sort, simple to test against Module content and delivery hours. The GCTB proposed herein, conforms to this ideal in that it is based on RICS competencies, as published for the APC and is a numeric measure with less opportunity for different interpretations.

One possible point for discussion, arising out of interviewees responses, is the actual proportion of the total 3600 hours available (in England) for delivery and assessment of the syllabus which should/ can be tied to benchmarks aimed, as they are, at addressing APC Competencies, at whatever level. At one point there is the suggestion that 70 or 80% of the 3600 hours should suffice for delivery of RICS Competencies, leaving 20 or 30% for everything else. That is, any other subjects not directly related to the latter. One interviewee, confirming this, suggests that the 20 or 30% be devoted to non-Competency related subjects, enabling his or her programme to give flavour. In fact, the current research has shown that the total hours spent on all three Competency-related areas (at whatever level) amounts to 3083 hours average across the universities, or 85%. This suggests that the actual proportion left "spare" in which to "give flavour" should be around 15%, or 540 hours. However, in the final GCTB this spare amount of hours has reduced to 412 hours making an increase in the RICS competency mapped content to 89% of 3600 maximum allowable hours for a degree.

Further consideration of certain Tutors' expressed wishes, to see a certain percentage of degree content not tied into RICS competencies may suggest a number of considerations;

**Firstly**, there are certain basic skills and understandings referred to there as "related study topics" which, whilst not directly represented by or within RICS competencies, are none the less essential to the preparation of students for those competencies which are so represented.

**Secondly**, as suggested by the RICS itself, may indeed wish to impart some particular specialism, based on an expertise peculiar to a particular institution and/or its staff at any one time, where this may be seen to enrich the employment prospects of the students in one way or another.

**Thirdly**, in defence of academics generally, it is suggested, as discussed in an earlier report (Perera & Pearson, 2011) there may be underlying issues here born of the "Education versus Training" debate. At one level, educators must understand, accept and seek to meet certain demands made on them by the RICS and by Employers. Indeed one of the drivers behind the current research seeks from educators' recognition of and a compliance with certain contents and standards determined largely by these latter stakeholders. However, it can be argued that it is the educator's wider duty to act not just as a training organisation for industry but as educators – that is, persons who will teach their students to think and to solve problems outside the fairly strict confines of a particular and specialist set of guidelines. The very fact that, as has been noted elsewhere, the RICS competencies are undergoing review just as this report is being written should perhaps warn against too rigid a regime. Educators must always be allowed some space (in this case within the overall 3600 hour umbrella) in which to impart skills in their students which will equip the latter to operate effectively in a future professional role where any one of the current Core Competencies, for example, no longer has the significance which it has at present.

## 5.4.2 Benchmarks; acceptance and support

Some interviewees expressed some potential resistance to the introduction of benchmarks. As this was a sample group there may be other institutions where this may be the reaction also. As with any system which is to be imposed top-down, so to speak, to prove a successful addition to existing quality systems the new benchmarks (GCTB) should be seen to be an easily operated system, and one that is itself validated by drawing on as wide a cross section of professional perspectives as is practicable. The GCTB produced have certainly achieved this with a wide participation of the representative cross section of the industry. As to ease of use, a numerical grid is proposed, one in which, as regards validation, hopefully this will have been addressed through the use of the professional forum. As to the enthusiasm or otherwise for implementation, this may depend upon how strict the measurement system appears to be, and how much it still allows for universities to express their individual strengths through their programme delivery whilst also meeting new minimum requirements as set by core benchmarks. The practicalities, including this permissible degree of flexibility have still to be determined.

It could be argued that the RICS relinquished a proportion of the automatic say it might otherwise have had over the content and conduct of its related programmes when it removed its requirement, as one of its “threshold standards” that a certain proportion of the staff teaching on a given programme be qualified members of the RICS. Whilst this in itself did not provide a mechanism for dictating Programme content, it seems fair to suggest that staff who were active members of this professional body might have had its interests and standards at heart rather than those who were not? Such an attachment may make the introduction and management of Benchmarks more easily attainable. This point is specifically referred to by an interviewee reported in section 5.1 above.

On a similar note, it is stated that the

***“RICS no longer approves UK partnership universities’ external examiner appointments”. (RICS, 2011)***

Universities are merely required to inform the Institution of the names of Examiners (commercial and academic); together with any RICS qualifications they hold (if any).

Both of the above relaxations of previous requirements may open the door, it is suggested, to a less stringent enforcement of any benchmarks which are created as a result of current research, unless the RICS can take action to enforce the use of GCTB through RICS – University partnership.



## 6.1 Using for Programme Development

CMF can be used effectively in programme development and validation. It provides a minimum threshold benchmark level of competency required in undergraduate studies in quantity surveying. In the first instance, modules can be designed to directly map either to a single or to multiple competencies. Alternatively, module content can be mapped to competencies using the competency map scoring system incorporating the Depth and Breadth scales described in Section 3 of this report. A sample structure of the GCTB is illustrated in Figure 2.19.

**Figure 2.19** Sample image of the GCTB

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C1.8.7	Supply chain management	1	1				
C1.8.8	Legislation on selecting project teams	1	0				
C2	CORE COMPETENCIES	136	43	94.4%	29.9%	2060	65%
C2.1	Commercial management of construction (T010) – Level 3	9	5	100.0%	55.6%	96	3.0%
C2.1.1	Estimating	1	1				
C2.1.2	Establishing budgets	1	1				
C2.1.3	Cash flows	1	1				
C2.1.4	Reporting financial progress against budget	1	1				
C2.1.5	Procurement of labour	1	0				
C2.1.6	Procurement of plant and materials	1	0				
C2.1.7	Procurement of sub-contracts	1	1				
C2.1.8	Financial management of supply chain	1	0				
C2.1.9	Financial management of multiple projects	1	0				
C2.2	Contract practice (T017) – Level 3	28	12	100.0%	42.9%	243	7.6%
C2.2.1	Principles of contract law	1	0				
C2.2.2	Legislation	1	0				
C2.2.3	Current case-law – look out for cases reported in journals	1	0				

The process of developing module content and ensuring satisfaction of GCTB can be summarised as follows:

- 1.** Identify module topics using the topics list provided in the GCTB.
- 2.** Assign these to relevant modules, in keeping with the overall design of the programme and module structure.
- 3.** Estimate the learning time required for each topic and note these against each topic using the CMT (Appendix B).
- 4.** Summation of the total times spent on each topic in each module will then provide an indication of total times spent on achieving each competency in the CMT.
- 5.** Ensure the Depth scale for each competency in GCTB is achieved.
- 6.** Ensure all topics deemed required in the GCTB Breadth scale is achieved.
- 7.** Record competency mapping for the new programme on the CMT spread sheet.
- 8.** This record serves as the competency mapping record (CMR) for future amendments and modifications to the programme and module content.
- 9.** The CMR can also be included with the programme validation documents as evidence for compliance with RICS competencies.

Module descriptors (specifications) can directly incorporate the study checklist topics or in the case of an existing module descriptor can be mapped against the Graduate competency threshold benchmark (GCTB). In developing a QS degree programme what is important is to ensure all topics deemed essential are incorporated in the module specifications. These are the topics that are marked 1 in the GCTB. The learning outcomes for module specifications therefore should be aligned with competencies in such a way the module content reflects all topics that are deemed essential in the GCTB.

The Depth scale of GCTB indicates the minimum time that is required to be spent on achieving the learning outcomes of modules. Therefore, the estimated time spent on learning module content should achieve or exceed the minimum benchmark values stipulated in GCTB. This is evaluated through estimating the time spent on learning each topic in a module and summing up all values, in keeping with the competency mapping using the CMT.

## 6.2 Using for Programme Management

Existing RICS accredited QS honours degree programmes can be mapped to the CMF. This provides a record of how modules are mapped against RICS competencies. This could then help in further developing the degree programmes and making these more industry relevant. The suggested process of using GCTB for programme management and development is summarised below:

- 1.** Using the CMT map all module content to competencies.
  - a.** Identify module topics and map these to the Breadth scale in the CMT.
  - b.** Estimate the amount of learning hours spent on each topic and record them against respective competencies in the Depth scale of the CMT.
  - c.** Carry out the process for all modules.
- 2.** Upon completion of mapping compare the CMR against the GCTB.
  - a.** Identify whether there are any uncovered topics.
  - b.** Identify whether the Depth scales of GCTB are achieved satisfactorily (Note: GCTB is a minimum threshold standard).
- 3.** The programme CMR is a systematically analysed record of how modules map against competencies.
- 4.** Where there are deficiencies in either the Depth or Breadth scales, take action to revise module specifications and/or the degree programme to ensure full compliance with the GCTB.
- 5.** Whenever module revisions or programme revisions take place always update the CMR established for the programme and check against GCTB to ensure compliance with RICS competencies.
- 6.** All programme revisions should be reported to the RICS partnership meetings supplemented with a CMR for the programme.

## 7.1 The need and the research approach

Over the years QS education has evolved from being rather technical in nature to fully fledged honours degrees with greater proportion of construction and project management orientation. The transition from diplomas to university degrees was in cognition with the general transformation of the higher education sector of the British education system. Subsequently the construction industry has undergone many changes and is currently facing a double dip economic recession causing a severe impact on opportunities for graduate employment within the sector. Construction industry employers have been vocal in identifying their perception of a lowering employability of graduates. A recent study investigating views on both industry and academia concluded that there are significant levels of dissatisfaction on quality of graduate (Perera & Pearson, 2011). It identified the root cause of the issue as graduates produced by different RICS accredited degree programmes have significantly different competency levels often far below what the industry expects.

A competency mapping framework (CMF) was proposed as a solution for achieving competencies at or above a minimum threshold benchmark. This research developed the CMF with a graduate competency threshold benchmark (GCTB) that uses the RICS competencies structure developed for the QS pathway to membership.

The research utilised a four stage research method using current RICS QS competencies along with the collaboration of industry and academic experts (refer section 2 for full details). The four stages were:

### Stage 1 – Pilot Study

A literature review of competencies and developing a competency mapping template (CMT). It used two industry and academic experts to iteratively develop and modify the CMT. The CMT is a dual vector scale matrix with a Breadth scale and a Depth scale each mapped against module descriptors. Breadth scale contains study topics while Depth scale contains competencies (refer Appendix B).

### Stage 2 – Case Studies

Four leading RICS accredited QS degree programmes were analysed and the module specifications were mapped to competencies using the CMT. This created a CMR for each case study. Descriptive statistical analysis was used to develop a conceptual competency benchmark using these four case studies.

### Stage 3 – Expert Forum

An expert forum with 12 industry experts and 3 academic experts were established to revise and modify the conceptual competency benchmark. The two stage Delphi process was used to record and harmonise views of experts. This stage produced the final graduate competency threshold benchmark (GCTB).

### Stage 4 – Review of Existing Processes to Integrate CMF

The final stage of the research involved reviewing existing programme development validation method, RICS programme accreditation and RICS – University partnership processes. This involved a document review as well as interviews of three QS degree programme directors to obtain their views on these processes and the GCTB. The report presents how the CMF can be used within these existing systems to ensure academic quality standards.

## 7.2 The Competency Mapping Framework (CMF)

The core element of the CMF is the GCTB which is a minimum level benchmark for mapping curricula to RICS competencies. This is produced in a MS Excel™ spreadsheet (Refer Appendix A). The GCTB contains a Breadth scale and a Depth scale (see Figure 19).

The Breadth scale is the checklist of topics categorised according to competencies. This is based on the RICS APC study checklist (RICS, 2008). It provides an indication of which topics need to be covered at competency levels 1 and 2. It should be noted that Level 3 competency achievement is not considered as the GCTB is a minimum threshold. Further, at graduate level it is unlikely that any competency could be achieved at Level 3 to a satisfactory degree. Each study topic contains a unique reference code.

The Depth scale provides the number of learning hours that should be spent at undergraduate level to attain respective competency. As module specifications of degree programmes specify learning hours as credits (where 1 credit = 10 hours of learning) the Depth scale provides a harmonious way to measure the learning requirements.

The summary statistics of the GCTB is presented in Table 2.6.

Analysing the Breadth scale it is clear that there are a total of 305 topics to be covered representing 85% of total topics at Level 1. As one would expect, this comes down to 102 topics (28%) at Level 2. Core competencies have 94% coverage of topics at Level 1 reducing to 30% at Level 2. This indicates that in the case of core competencies, there is foundation level knowledge expected rather than expertise in its application. However, the highest coverage at Level 2 is for Mandatory competencies (41%). This is mainly because those Mandatory competencies represent generic skills and as such are expected to be covered to a higher degree of competence at graduate level.

A comparison of the effect of changes proposed in the GCTB is presented in Table 2.7. This compares the GCTB with the mean values extracted from the four case studies of RICS accredited QS degree programmes (refer section 3.3 for details).

Analysing the Depth scale, there are a total of 3188 hours of learning time expected on RICS competencies. This is of possible 3600 hours representing 89% of time. This is much higher than current provision of most RICS accredited programmes (85%). As expected, 65% of the time is expected to be spent on Core competencies which accounts for 57% full credit allocation for a degree programme. This is an increase in emphasis from the current provision (53%). This represents a reasonable content considering the specialist nature of the profession. This is then followed by Optional and Mandatory competencies respectively.

Another notable change from the existing provision is the consequent reduction in time allocation with respect to learning related to Non RICS competencies. There is a 3% reduction in time. These learning primarily represent generic study areas such as basic economics, law, mathematical skills etc. However, one could argue as these underpin direct RICS competency related topics the shift could be minimal and depends on interpretation of mapping. It is for this reason that future revisions to competencies and the study checklist should consider the inclusion of such topics at Level 1.

The amount of time to be spent on any one topic is difficult to precisely stipulate as well as it may make the GCTB too prescriptive. The uniqueness of individual degree programmes will therefore be defined on the lines of variations in the extent and level of coverage of topics. The GCTB therefore, facilitates adequate provision for innovation in individual degree programmes while ensuring minimum levels of satisfaction of RICS competencies.

**Table 2.6** Summary statistics of GCTB

Competency Type		Breadth Scale				Depth Scale	
		Level 1 Topics	Level 2 Topics	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
<b>C1</b>	Mandatory Competencies	66	31	88%	41%	521	16%
<b>C2</b>	Core Competencies	136	43	94%	30%	2060	65%
<b>C3</b>	Optional Competencies	103	28	74%	20%	607	19%
<b>Totals</b>		<b>305</b>	<b>102</b>	<b>85%</b>	<b>28%</b>	<b>3188</b>	<b>100.0%</b>

**Table 2.7** Comparison of proposed competency time allocations (GCTB)

Competency Type		Proposed on GCTB		Existing Composition (Case Studies)	
		Credit hours	% Percentage	Credit hours	% Percentage
<b>C1</b>	Mandatory Competencies	521	15%	557	16%
<b>C2</b>	Core Competencies	2060	57%	1899	53%
<b>C3</b>	Optional Competencies	607	17%	628	17%
<b>C4</b>	Non RICS Competencies	412	11%	517	14%
<b>Totals</b>		<b>3600</b>	<b>100%</b>	<b>3600</b>	<b>100%</b>

## 7.3 Recommended use of the CMF

It is envisaged that CMF can be used primarily in two ways:

1. For the development of new degree programmes and validation
2. For monitoring and management of existing degree programmes.

These options are discussed in detail in section 6. When new programmes are developed, the GCTB can be used to identify module content for module descriptors. It is suggested that the CMT to be used to initially map topics of module descriptors (specifications) to RICS competencies. The systematic approach presented in the CMF helps in this process to ensure that competency levels exceed minimum requirements. Upon completion of the CMT the resultant CMR forms an authentic record of how module descriptors are mapped to RICS competencies.

The GCTB can be used to evaluate existing RICS accredited degree programmes. When a CMR for a RICS accredited degree programme is created it forms a formal record of how degree programme content maps to RICS competencies. This can then be evaluated against the GCTB to identify whether degree programmes fully comply with the minimum thresholds identified in the GCTB. Where benchmarks are not achieved programmes can be modified to comply with GCTB. In a similar way the CMR for the programme should be updated whenever programme modifications or module modifications are carried out. It can then be checked against the GCTB to check compliance.

## 7.4 Final Recommendations

This report introduces CMF as a system for maintaining and improving quality and professional standards of QS degree programmes accredited by the RICS. The following are the primary recommendations of the report.

- It is recommended that the CMF be made an essential part of the RICS – University partnership agreement. This way it provides a mechanism to ensure that all RICS accredited programmes meet the exit threshold defined by the GCTB. Each RICS accredited programme should complete a CMR which then can be updated and presented to the RICS – University partnership meeting annually with any changes made being highlighted.
- CMF should be used for ensuring achievement of competencies in all new QS degree programmes to be accredited by the RICS. It should form part of programme validation and accreditation documents (where RICS accreditation is sought).
- In the case of all new programmes seeking RICS accreditation, completion of the CMR should be mandatory, to ensure it meets GCTB thresholds.
- The CMF also provides a useful process for the programme external examiners. They can be entrusted to comment on the changes to programmes evaluated against the GCTB thereby ensuring compliance.
- The GCTB recommends only 84% of study topic-related competencies at Level 1. It is suggested that innovative programmes should aim at achieving the remaining over and above the minimum benchmark recommended.

The GCTB developed and presented herein is based on current RICS competencies (RICS, 2009) and APC study Checklist documentation (RICS, 2008 a). It is recommended that whenever competency structures change the GCTB should be updated accordingly.



## 7.5 Limitations

The GCTB created was based on existing set of RICS competencies and the APC study checklist of topics produced by the RICS. It was noted that this checklist had many limitations. There were many related study topics that were missing from the list. This indicates that it may not be up to date or fully reflect current practice. There is some repetition of topics, appearing on different competencies. Some topic descriptors were not clear as to the meaning or content.

Added to this one should perhaps recognise and accommodate the general duty of educators to prepare their students in the broadest sense, and not merely in respect of certain specified skills areas i.e. provide “education”.

The expert forum for the development of GCTB was limited to 15 industry and academic experts. A higher number would have achieved greater representation of views. However, in the selection of the expert forum care was exercised to achieve a good distribution of expertise from consulting to contracting, from practice based to academic and a distribution of different organisation sizes reflecting micro, SME and large organisations.

## 7.6 Further Research

It is proposed that further research should be undertaken to further develop the study check list to make it reflect the work profile of the modern QS as accurately as possible. This should attempt at re-classification of some of the study topics, using better descriptors for topics.

The same problem can be extrapolated to the situation where new entrants to RICS come through the Assoc RICS route. Those seeking Associate membership must pass the ATC for which they will be eligible upon successful completion of a Foundation Degree or equivalent, together with a specified period of approved work experience. A similar benchmark for such programmes the RICS seek to recognise will eliminate such problems of dissatisfaction and subjective interpretation of competencies as have been discussed above.

## Acknowledgements

The authors would like to acknowledge the assistance they received from the following in the preparation of this report and in the conduct of the research;

**Damilola Ekundayo**, Graduate Tutor, Faculty of Engineering & Environment, Northumbria University, *for his assistance in carrying out analysis of competency mappings and expert forum.*

**Dr Lei Zhou**, Lecturer, Faculty of Engineering & Environment, Northumbria University, *for his assistance with conducting and transcribing interviews and analysis of the same and for his assistance in the formulation of questionnaires.*

**Anushi Rodrigo**, Doctoral Student, Faculty of Engineering & Environment, Northumbria University, *for her assistance with numerous tasks related to the project.*

Colleagues from the **Quantity Surveying Subject Group** within the Faculty of Engineering and Environment, Northumbria University, *for support with the competency mapping.*

All members of the **Expert forum** who gave time to be interviewed and participation in the ratification process.

The three **QS programme directors**, who participated in the semi structured interview process.

Academic staff from the four **Schools of Built Environment**, from the four universities comprising the **Case Study Group**, who completed the detailed programme related competency mapping exercise.

All members of the **Construction Economics & Management research group of the Faculty of Engineering and Environment**, Northumbria University ([www.northumbria-qs.org](http://www.northumbria-qs.org))

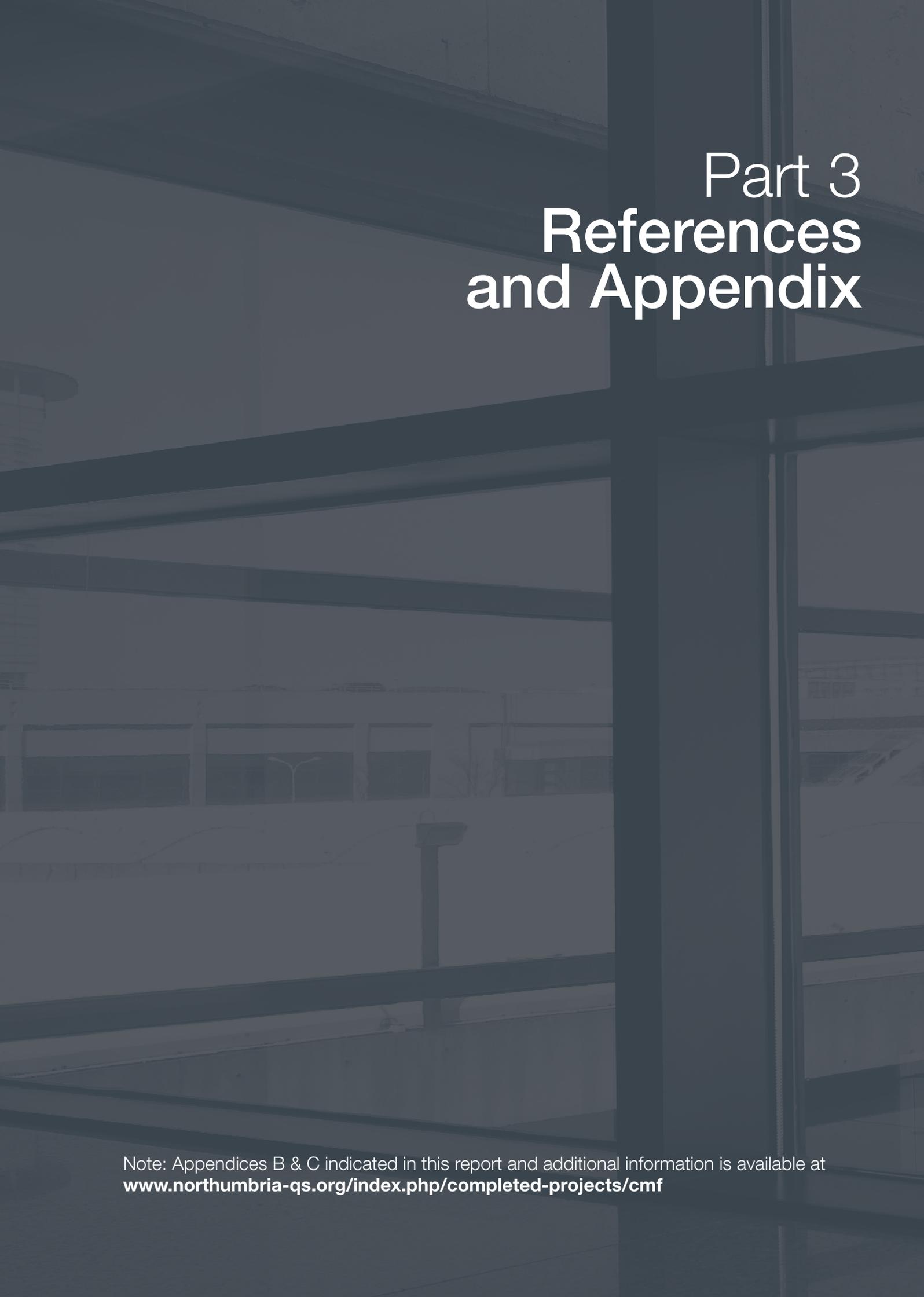
**Professor Allan Ashworth** and **Mr Chris Winks** who continuously supported the research especially in formulating the scoring system and initial direction of the research,

**Professor Glen McHale**, Executive Dean of the new Faculty of Engineering and Environment, **Steve Hodgson**, former Dean of School and **Professor David Greenwood**, former Associate Dean (Research) of the School of the Built and Natural Environment, Northumbria University, *for their help and encouragement with this work.*

**Srinath Perera and John Pearson**

August 2013





# Part 3 References and Appendix

Note: Appendices B & C indicated in this report and additional information is available at [www.northumbria-qs.org/index.php/completed-projects/cmf](http://www.northumbria-qs.org/index.php/completed-projects/cmf)

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- Appendix B & C: available at <http://www.northumbria-qs.org/index.php/completed-projects/cmf>.

Final Graduate Competency Threshold Benchmark (GCTB)

Level 1 – Knowledge and understanding  
 Level 2 – Application of knowledge and understanding  
 Level 3 – Reasoned advice and depth of technical knowledge

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
<b>C1</b>	<b>MANDATORY COMPETENCIES</b>	<b>66</b>	<b>31</b>	<b>88%</b>	<b>41.3%</b>	<b>521</b>	<b>16%</b>
<b>C1.1</b>	Accounting principles and procedures (M001) – Level 1	8	0	80.0%	0.0%	10	0.3%
<b>C1.1.1</b>	Balance sheets / profit and loss account	1	0				
<b>C1.1.2</b>	Taxation	1	0				
<b>C1.1.3</b>	Revenue and capital expenditure	1	0				
<b>C1.1.4</b>	Cash flows	1	0				
<b>C1.1.5</b>	Auditing	1	0				
<b>C1.1.6</b>	Ratio analysis	0	0				
<b>C1.1.7</b>	Credit control	0	0				
<b>C1.1.8</b>	Profitability	1	0				
<b>C1.1.9</b>	Insolvency	1	0				
<b>C1.1.10</b>	Legislation	1	0				
<b>C1.2</b>	Business planning (M002) – Level 1	6	0	100.0%	0.0%	24	0.8%
<b>C1.2.1</b>	Legislation	1	0				
<b>C1.2.2</b>	Short / long term strategies	1	0				
<b>C1.2.3</b>	Market analysis	1	0				
<b>C1.2.4</b>	Five year plans	1	0				
<b>C1.2.5</b>	Business support services – administration, secretarial, HR, IT etc.	1	0				
<b>C1.2.6</b>	Staffing levels – recruitment / turnover	1	0				
<b>C1.3</b>	Client care (M003) – Level 2	6	4	75.0%	50.0%	36	1.1%
<b>C1.3.1</b>	Understanding client objectives	1	1				
<b>C1.3.2</b>	Establishing client's brief	1	1				
<b>C1.3.3</b>	Appointment documents	0	0				
<b>C1.3.4</b>	Fees	1	0				
<b>C1.3.5</b>	Complaints procedures	0	0				

RICS Research – RICS Professional Competency Mapping Framework  
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Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C1.3.6	Key Performance Indicators	1	0				
C1.3.7	Establishing communications with client team	1	1				
C1.3.8	Involvement of stakeholders	1	1				
C1.4	Communication and negotiation (M004) – Level 2	16	14	100.0%	87.5%	138	4.3%
	Oral communication:						
C1.4.1	Phone calls	1	1				
C1.4.2	Reporting at meetings	1	1				
C1.4.3	Facilitating/chairing meeting	1	1				
C1.4.4	Client and bid presentations	1	1				
C1.4.5	Staff presentations	1	1				
C1.4.6	Contractor/consultant interviews	1	1				
C1.4.7	Public speaking at seminars etc	1	1				
C1.4.8	Listening skills	1	1				
	Written/graphical communication:						
C1.4.9	Letters, memos and emails	1	1				
	Report writing:						
C1.4.10	Programming	1	1				
C1.4.11	Using drawn information – checking scales and revisions	1	1				
C1.4.12	Using CAD documents	1	1				
	Negotiation:						
C1.4.13	Establishing objectives	1	0				
C1.4.14	Setting strategy	1	1				
C1.4.15	Collecting and presenting evidence	1	1				
C1.4.16	Confirmation of agreement	1	0				
C1.5	Conduct rules, ethics and professional practice (M005) – Level 3	9	2	64.3%	14.3%	26	0.8%
C1.5.1	RICS Rules of Conduct	1	1				
C1.5.2	Conduct befitting a chartered surveyor	1	1				
C1.5.3	Registration of firms	0	0				

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C1.5.4	Complaints procedure	0	0				
C1.5.5	Conflicts of interest	1	0				
C1.5.6	Gifts	1	0				
C1.5.7	Professional Indemnity Insurance	1	0				
C1.5.8	Client accounts	0	0				
C1.5.9	Regulation	1	0				
C1.5.10	Disciplinary procedures	1	0				
C1.5.11	Lifelong learning – CPD	1	0				
C1.5.12	Current RICS structure	0	0				
C1.5.13	Faculties	0	0				
C1.5.14	Current RICS issues and initiatives	1	0				
C1.6	Data management (M007) – Level 1	7	5	100.0%	71.4%	82	2.6%
C1.6.1	BCIS / BMI or other external sources	1	1				
C1.6.2	Elemental analyses	1	1				
C1.6.3	Pricing books	1	1				
C1.6.4	Data base use generally	1	1				
C1.6.5	Employer’s in-house data storage and filing systems	1	0				
C1.6.6	Scheduling	1	1				
C1.6.7	Libraries	1	0				
C1.7	Health and safety (M008) – Level 2	6	0	100.0%	0.0%	72	2.3%
	Personal health and safety at work – RICS publication ‘Surveying Safely’ Personal safety procedures when visiting a construction site Common health and safety risks in construction Health and safety legislation:						
C1.7.1	Generally	1	0				
C1.7.2	At work	1	0				
C1.7.3	Construction specific	1	0				
C1.7.4	Sector specific	1	0				
C1.7.5	Client specific	1	0				
C1.7.6	Asbestos and other hazardous materials	1	0				
C1.8	Teamworking (M010) – Level 1	8	6	100.0%	75.0%	133	4.2%
C1.8.1	Understand the role of team members	1	1				

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		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C1.8.2	Appointing the project team	1	1				
C1.8.3	Relationships with other team members	1	1				
C1.8.4	Communicating with other team members	1	1				
C1.8.5	Partnering and collaborative working	1	1				
C1.8.6	Strategic alliance	1	0				
C1.8.7	Supply chain management	1	1				
C1.8.8	Legislation on selecting project teams	1	0				
<b>C2</b>	<b>CORE COMPETENCIES</b>	<b>136</b>	<b>43</b>	<b>94.4%</b>	<b>29.9%</b>	<b>2060</b>	<b>65%</b>
C2.1	Commercial management of construction (T010) – Level 3	9	5	100.0%	55.6%	96	3.0%
C2.1.1	Estimating	1	1				
C2.1.2	Establishing budgets	1	1				
C2.1.3	Cash flows	1	1				
C2.1.4	Reporting financial progress against budget	1	1				
C2.1.5	Procurement of labour	1	0				
C2.1.6	Procurement of plant and materials	1	0				
C2.1.7	Procurement of sub-contracts	1	1				
C2.1.8	Financial management of supply chain	1	0				
C2.1.9	Financial management of multiple projects	1	0				
C2.2	Contract practice (T017) – Level 3	28	12	100.0%	42.9%	243	7.6%
C2.2.1	Principles of contract law	1	0				
C2.2.2	Legislation	1	0				
C2.2.3	Current case-law – look out for cases reported in journals	1	0				
C2.2.4	Standard forms of main and sub contract – e.g. JCT, NEC/ ECC, GC Works, ICE, ACA, IChemE, FIDIC, etc.	1	1				
C2.2.5	Roles & responsibilities of parties – Client, Contract Administrator / Employer's Agent / Project manager / Engineer, Contractor, Sub-contractors, Quantity Surveyor	1	1				

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C2.2.6	Assignment / Novation	1	0				
C2.2.7	Third party rights – Legislation / Collateral Warranties	1	0				
C2.2.8	Letters of intent – Comfort letters / Consent to spend / Recognition of contract	1	0				
C2.2.9	Performance security – Bonds / Parent Company Guarantees	1	0				
C2.2.10	Insurances	1	0				
C2.2.11	Advance payments	1	0				
C2.2.12	Interim valuations and payment provisions	1	1				
C2.2.13	Materials on/off site	1	1				
C2.2.14	Fluctuations	1	1				
C2.2.15	Retention – retention bonds	1	1				
C2.2.16	Change procedures	1	1				
C2.2.17	Valuing change – variations / compensation events	1	1				
C2.2.18	Extensions of time	1	1				
C2.2.19	Claims / Loss and Expense	1	1				
C2.2.20	Dispute avoidance and resolution	1	0				
C2.2.21	Named / Nominated subcontractors	1	0				
C2.2.22	Sectional Completion / Partial Possession	1	0				
C2.2.23	Design Portions / Performance specified works	1	0				
C2.2.24	Determination	1	0				
C2.2.25	Final Accounts	1	1				
C2.2.26	Completion	1	0				
C2.2.27	Liquidated and Ascertained Damages	1	0				
C2.2.28	Defects rectification period	1	1				
C2.3	Construction technology and environmental services (T013) – Level 3	30	0	85.7%	0.0%	660	20.7%
	Construction technology						
C2.3.1	Substructures – basements, types of piling, etc.	1	0				
C2.3.2	Superstructures	1	0				

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		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C2.3.3	Comparison of concrete / steel frames	1	0				
C2.3.4	Floor structures	1	0				
C2.3.5	External walls, windows and doors	1	0				
C2.3.6	Cladding / glazing	1	0				
C2.3.7	Roof structures and coverings	1	0				
C2.3.8	Partitioning systems and doors	1	0				
C2.3.9	Finishes and fixtures	1	0				
C2.3.10	Hard and soft landscaping	0	0				
	<b>Engineering structures</b>						
C2.3.11	Bridges	1	0				
C2.3.12	Tunnels	1	0				
C2.3.13	Roads	1	0				
C2.3.14	Railways	0	0				
C2.3.15	Waterways	1	0				
C2.3.16	Sea defences	1	0				
C2.3.17	Earthworks	1	0				
C2.3.18	Sewage treatment plants	1	0				
C2.3.19	Processing plant	0	0				
	<b>Services technology</b>						
C2.3.20	Electrical systems	1	0				
C2.3.21	Mechanical systems	1	0				
C2.3.22	Internal / external drainage	1	0				
C2.3.23	Mains services	1	0				
C2.3.24	Air-conditioning / ventilation systems	1	0				
C2.3.25	Fire safety systems	1	0				
C2.3.26	Security systems	1	0				
C2.3.27	Environmental systems and controls	1	0				
C2.3.28	Data systems	1	0				
C2.3.29	Building types and other structures	1	0				
C2.3.30	Building regulations and codes	1	0				

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C2.3.31	Planning legislation and procedures	0	0				
C2.3.32	Party wall issues / rights of light	0	0				
C2.3.33	Dangerous / banned substances – asbestos etc	1	0				
C2.3.34	Pre-fabrication	1	0				
C2.3.35	Disability legislation	1	0				
C2.4	Design economics and cost planning (T022) – Level 3	15	11	100.0%	73.3%	275	8.6%
C2.4.1	Economics of design –site density, wall / floor ratio, storey heights, room sizes, lettable / non-lettable	1	1				
C2.4.2	Sources of cost data – BCIS / in-house database / other external sources	1	1				
C2.4.3	Inflation (tender / construction)	1	1				
C2.4.4	Location factors, regional variations	1	1				
C2.4.5	Currency fluctuations	1	0				
C2.4.6	Estimating	1	1				
C2.4.7	Cost Plans	1	1				
C2.4.8	Cost Planning	1	1				
C2.4.9	Life cycle costing – capital / running costs / replacement	1	1				
C2.4.10	Value Engineering	1	1				
C2.4.11	Value Management	1	1				
C2.4.12	Risk Management and Analysis (contingency)	1	1				
C2.4.13	State of the construction market	1	0				
C2.4.14	State of the economy generally – locally and globally	1	0				
C2.4.15	Interest rates	1	0				
C2.5	Procurement and tendering (T062) – Level 3	24	4	92.3%	15.4%	203	6.4%
	Types of procurement:						
C2.5.1	Traditional	1	1				
C2.5.2	Design and Build	1	1				
C2.5.3	Management Contracting	1	0				

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		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
C2.5.4	Construction Management	1	0				
C2.5.5	Measured Term	1	0				
C2.5.6	Serial contracting	0	0				
	<b>Financial basis:</b>						
C2.5.7	Lump sum	1	0				
C2.5.8	Re-measured	1	0				
C2.5.9	Reimbursable	1	0				
C2.5.10	Target cost	1	0				
C2.5.11	Guaranteed or Agreed Maximum Price	1	0				
	<b>Tendering:</b>						
C2.5.12	Standard rules of tendering – codes of practice, practice notes	1	0				
C2.5.13	Single / two-stage tendering – competitive / negotiated	1	0				
C2.5.14	Compilation of tender lists – pre-qualifying contractors	1	0				
C2.5.15	Compilation of tender documents	1	0				
C2.5.16	Tender analysis	1	0				
C2.5.17	Tender reports	1	0				
C2.5.18	Partnering – project and strategic	1	0				
C2.5.19	Private Finance Initiative – PFI	1	0				
C2.5.20	Public Private Partnership – PPP	1	0				
C2.5.21	Prime contracting	0	0				
C2.5.22	Best Value	1	1				
C2.5.23	Whole life costing	1	1				
C2.5.24	Supply Chain Management	1	0				
C2.5.25	Lean Construction	1	0				
C2.5.26	Key Performance Indicators – KPI	1	0				
C2.6	Project financial control and reporting (T067) – Level 3	10	3	100.0%	30.0%	121	3.8%
C2.6.1	Post contract cost control	1	1				
C2.6.2	Change control procedures	1	0				

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C2.6.3	Change control forms	1	0				
C2.6.4	Cost reporting	1	1				
C2.6.5	Final accounts	1	1				
C2.6.6	Loss and expense	1	0				
C2.6.7	Risk management	1	0				
C2.6.8	Cash flows	1	0				
C2.6.9	Value engineering	1	0				
C2.6.10	Benchmarking / Best value	1	0				
C2.7	Quantification and costing of construction works (T074) – Level 3	20	8	95.2%	38.1%	462	14.5%
	Methods of measurement:						
C2.7.1	SMM / CESMM	1	1				
C2.7.2	RICS Code of Measuring Practice	1	0				
	Preparation of pricing documents:						
C2.7.3	Tender documents generally	1	1				
C2.7.4	Bill of quantity	1	1				
C2.7.5	Schedule of works	1	1				
C2.7.6	Schedule of rates	1	1				
C2.7.7	Provisional Sums / Prime Cost Sums	1	1				
	Analysis of price:						
C2.7.8	Tender returns	1	0				
C2.7.9	Guaranteed / Agreed Maximum Price	0	0				
C2.7.10	Target cost – Pain / Gain mechanisms	1	0				
C2.7.11	Loss and expense	1	0				
C2.7.12	Preliminaries	1	0				
C2.7.13	Dayworks	1	0				
	Valuation of works:						
C2.7.14	Interim valuations	1	1				
C2.7.15	Valuing change	1	0				
C2.7.16	Loss and expense	1	0				
C2.7.17	Final account	1	0				

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		305	102	85%	28%	3188	100.0%
C2.7.18	Reporting on cost	1	1				
C2.7.19	Tender report	1	0				
C2.7.20	Correcting errors in tenders	1	0				
C2.7.21	Post contract financial reporting	1	0				
<b>C3</b>	<b>OPTIONAL COMPETENCIES</b>	<b>103</b>	<b>28</b>	<b>73.6%</b>	<b>20.0%</b>	<b>607</b>	<b>19%</b>
C3.1	Capital allowances (T008)	7	0	58.3%	0.0%	11	0.4%
C3.1.1	Current legislation	1	0				
C3.1.2	Capital and revenue expenditure	1	0				
C3.1.3	Taxation	1	0				
C3.1.4	Capital Allowances legislation	1	0				
C3.1.5	Claiming capital allowances	1	0				
C3.1.6	Plant and machinery	1	0				
C3.1.7	Industrial buildings	0	0				
C3.1.8	Hotels	0	0				
C3.1.9	Research and development	1	0				
C3.1.10	Enterprise zones	0	0				
C3.1.11	First year allowances	0	0				
C3.1.12	Enhanced capital allowances	0	0				
C3.1	Capital allowances (T008)	7	0	58.3%	0.0%	11	0.4%
C3.2.1	How standard forms of contract deal with conflict avoidance and dispute resolution	1	0				
C3.2.2	Conflict avoidance	1	0				
C3.2.3	Partnering	1	0				
C3.2.4	Negotiation	1	0				
C3.2.5	Mediation	1	0				
C3.2.6	Conciliation	1	0				
C3.2.7	Adjudication	1	0				
C3.2.8	Arbitration	1	0				
C3.2.9	Pre-action Protocol	1	0				
C3.2.10	Litigation	1	0				

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		305	102	85%	28%	3188	100.0%
C3.2.11	Expert Witness	1	0				
C3.2.12	Independent Expert Determination	1	0				
C3.3	Contract administration (T016)	21	2	95.5%	9.1%	81	2.5%
C3.3.1	Standard forms of Contract – JCT, GC Works, ICE, NEC/ ECC, ACA (PPC2000) etc	1	1				
C3.3.2	Roles and responsibilities of parties -client, contractors, designers, Q.S	1	1				
C3.3.3	Role and responsibilities of person administering the contract – e.g. CA, Architect, EA, PM, Engineer etc.	1	0				
C3.3.4	Co-ordination of parties	1	0				
C3.3.5	Design co-ordination	1	0				
C3.3.6	Planning and building regulatory controls	1	0				
C3.3.7	Health & Safety – CDM	1	0				
C3.3.8	Monitoring progress	1	0				
C3.3.9	Monitoring quality	0	0				
C3.3.10	Insurances	1	0				
C3.3.11	Bonds / Parent Company Guarantees	1	0				
C3.3.12	Third party rights	1	0				
C3.3.13	Payment provisions	1	0				
C3.3.14	Change procedures	1	0				
C3.3.15	Sectional Completion / Partial Possession	1	0				
C3.3.16	Nominated / Named Subcontractors	1	0				
C3.3.17	Extensions of time / loss and expense	1	0				
C3.3.18	Materials on / off site	1	0				
C3.3.19	Determination	1	0				
C3.3.20	Liquidated and ascertained damages	1	0				
C3.3.21	Completion	1	0				
C3.3.22	Defects / rectification period	1	0				
C3.4	Corporate recovery and insolvency (T020)	2	0	15.4%	0.0%	10	0.3%
C3.4.1	Types of Insolvency	1	0				

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		305	102	85%	28%	3188	100.0%
C3.4.2	Bankruptcy	0	0				
C3.4.3	Individual voluntary arrangement	0	0				
C3.4.4	Liquidation	0	0				
C3.4.5	Administrative receivership / Fixed charge receivership	0	0				
C3.4.6	Company voluntary arrangement	0	0				
C3.4.7	Role of the QS if insolvency occurs	1	0				
C3.4.8	Termination and suspension of contracts	0	0				
C3.4.9	Assignment / novation	0	0				
C3.4.10	Ownership of material and plant	0	0				
C3.4.11	Bonds and guarantees	0	0				
C3.4.12	Set-off	0	0				
C3.4.13	RICS Information Paper on Construction Insolvency	0	0				
C3.5	Due Diligence (T025)	3	0	20.0%	0.0%	6	0.2%
C3.5.1	Project monitoring on management style contracts	0	0				
C3.5.2	Fund monitoring	0	0				
C3.5.3	Feasibility study	0	0				
C3.5.4	Planning and building regulatory control	0	0				
C3.5.5	Suitability of team	1	0				
C3.5.6	Suitability of procurement route	1	0				
C3.5.7	Tendering	0	0				
C3.5.8	Contractual arrangements	0	0				
C3.5.9	Third party rights	0	0				
C3.5.10	Suitability of programme	0	0				
C3.5.11	Cash flows	0	0				
C3.5.12	Interim payments	0	0				
C3.5.13	Draw-down	0	0				
C3.5.14	Final accounts	0	0				
C3.5.15	Risk	1	0				
C3.6	Insurance (T045)	6	0	50.0%	0.0%	13	0.4%

Code	RICS QS Study Check List Topics	Breadth Scale				Depth Scale	
		Level 1	Level 2	% Topic Coverage Level 1	% Topic Coverage Level 2	Credit hours	% Percentage
		305	102	85%	28%	3188	100.0%
<b>C3.6.1</b>	Professional Indemnity Insurance	1	0				
<b>Generally and RICS requirements:</b>							
<b>C3.6.2</b>	Indemnifying the employer	1	0				
<b>C3.6.3</b>	Third-party liability – persons and property	1	0				
<b>C3.6.4</b>	Insurance of the works – joint names	1	0				
<b>C3.6.5</b>	Subrogation	1	0				
<b>C3.6.6</b>	Non-negligence insurance	0	0				
<b>C3.6.7</b>	Setting level of cover	0	0				
<b>C3.6.8</b>	In the aggregate / each and every event	0	0				
<b>C3.6.9</b>	Excess	0	0				
<b>C3.6.10</b>	Net contribution clause	0	0				
<b>C3.6.11</b>	Performance bonds	1	0				
<b>C3.6.12</b>	Fire insurance valuations	0	0				
<b>C3.7</b>	Programming and planning (T063)	16	8	100.0%	50.0%	97	3.0%
<b>C3.7.1</b>	Project programming	1	1				
<b>C3.7.2</b>	Multi-project programming	1	0				
<b>C3.7.3</b>	Flow diagrams	1	1				
<b>C3.7.4</b>	Activity schedules	1	1				
<b>C3.7.5</b>	Gant charts	1	1				
<b>C3.7.6</b>	Critical path	1	1				
<b>C3.7.7</b>	Key milestones	1	1				
<b>C3.7.8</b>	Float	1	1				
<b>C3.7.9</b>	Cash flows	1	1				
<b>C3.7.10</b>	Progress monitoring	1	0				
<b>C3.7.11</b>	Project handbook	1	0				
<b>C3.7.12</b>	Project Execution Plans – PEP	1	0				
<b>C3.7.13</b>	Establishing team	1	0				
<b>C3.7.14</b>	Roles and responsibilities	1	0				
<b>C3.7.15</b>	Commissioning / handover procedure	1	0				
<b>C3.7.16</b>	Close-out reports	1	0				

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<b>C3.8</b>	Project evaluation (T066)	13	10	100.0%	76.9%	118	3.7%
<b>C3.8.1</b>	Appraisal methods	1	1				
<b>C3.8.2</b>	Residual value	1	1				
<b>C3.8.3</b>	Value / income	1	1				
<b>C3.8.4</b>	Valuation of property / rental values	1	0				
<b>C3.8.5</b>	RICS Red Book	1	0				
<b>C3.8.6</b>	Costs	1	1				
<b>C3.8.7</b>	Land acquisition	1	0				
<b>C3.8.8</b>	Construction costs	1	1				
<b>C3.8.9</b>	Fees	1	1				
<b>C3.8.10</b>	Finance costs	1	1				
<b>C3.8.11</b>	Taxation, grants, capital allowances	1	1				
<b>C3.8.12</b>	Profitability	1	1				
<b>C3.8.13</b>	Planning	1	1				
<b>C3.9</b>	Risk management (T077)	11	7	84.6%	53.8%	58	1.8%
<b>C3.9.1</b>	Workshops	1	1				
<b>C3.9.2</b>	Identification	1	1				
<b>C3.9.3</b>	Register	1	1				
<b>C3.9.4</b>	Management plan	1	1				
<b>C3.9.5</b>	Mitigation	1	0				
<b>C3.9.6</b>	QS contribution to risk management	1	1				
<b>C3.9.7</b>	Risk analysis	1	1				
<b>C3.9.8</b>	Probability and impact	1	1				
<b>C3.9.9</b>	Expected Monetary Value – EMV	1	0				
<b>C3.9.10</b>	Monte Carlo Simulation	1	0				
<b>C3.9.11</b>	Central Limit Theory – CLT	0	0				
<b>C3.9.12</b>	Route Mean Square – RMS	0	0				
<b>C3.9.13</b>	Contingency	1	0				
<b>C3.10</b>	Sustainability (M009)	12	1	100.0%	8.3%	144	4.5%
<b>C3.10.1</b>	Sustainable development / construction	1	1				
<b>C3.10.2</b>	National and international regulations	1	0				

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C3.10.3	Environmental assessment methods – e.g. LEED, BREEAM etc.	1	0				
C3.10.4	Building Regulations and Codes	1	0				
C3.10.5	Contaminated land	1	0				
C3.10.6	Waste management	1	0				
C3.10.7	Recyclable materials	1	0				
C3.10.8	Sustainable materials	1	0				
C3.10.9	Building environmental management systems	1	0				
C3.10.10	Water conservation	1	0				
C3.10.11	Energy generation	1	0				
C3.10.12	Energy conservation	1	0				
<b>Total Topics = 359</b>		<b>305</b>	<b>102</b>	<b>85%</b>	<b>28%</b>	<b>3188</b>	<b>100%</b>

**Level 1** – Knowledge and understanding

**Level 2** – Application of knowledge and understanding

**Level 3** – Reasoned advice and depth of technical knowledge

**RICS HQ**

Parliament Square  
London SW1P 3AD  
United Kingdom

**Worldwide media enquiries:**

e [pressoffice@rics.org](mailto:pressoffice@rics.org)

**Contact Centre:**

e [contactrics@rics.org](mailto:contactrics@rics.org)  
t +44 (0)24 7686 8555  
f +44 (0)20 7334 3811

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RICS has a worldwide network. For further information simply contact the relevant RICS office or our Contact Centre.

**Europe**  
(excluding United Kingdom and Ireland)  
Rue Ducale 67  
1000 Brussels  
Belgium  
t +32 2 733 10 19  
f +32 2 742 97 48  
[ricseurope@rics.org](mailto:ricseurope@rics.org)

**United Kingdom**  
Parliament Square  
London SW1P 3AD  
United Kingdom  
t +44 (0)24 7686 8555  
f +44 (0)20 7334 3811  
[contactrics@rics.org](mailto:contactrics@rics.org)

**Oceania**  
Suite 2, Level 16  
1 Castlereagh Street  
Sydney, NSW 2000  
Australia  
t +61 2 9216 2333  
f +61 2 9232 5591  
[info@rics.org.au](mailto:info@rics.org.au)

**Asia**  
Room 2203  
Hopewell Centre  
183 Queen's Road East  
Wanchai  
Hong Kong  
t +852 2537 7117  
f +852 2537 2756  
[ricsasia@rics.org](mailto:ricsasia@rics.org)

**Africa**  
PO Box 3400  
Witkoppen 2068  
South Africa  
t +27 11 467 2857  
f +27 86 514 0655  
[ricsafrica@rics.org](mailto:ricsafrica@rics.org)

**Middle East**  
Office G14, Block 3  
Knowledge Village  
Dubai  
United Arab Emirates  
t +971 4 375 3074  
f +971 4 427 2498  
[ricsmenea@rics.org](mailto:ricsmenea@rics.org)

**Americas**  
One Grand Central Place  
60 East 42nd Street  
Suite 2810  
New York 10165 – 2810  
USA  
t +1 212 847 7400  
f +1 212 682 1295  
[ricsamericas@rics.org](mailto:ricsamericas@rics.org)

**Ireland**  
38 Merrion Square  
Dublin 2  
Ireland  
t +353 1 644 5500  
f +353 1 661 1797  
[ricsireland@rics.org](mailto:ricsireland@rics.org)

**India**  
48 & 49 Centrum Plaza  
Sector Road  
Sector 53, Gurgaon – 122002  
India  
t +91 124 459 5400  
f +91 124 459 5402  
[ricsindia@rics.org](mailto:ricsindia@rics.org)