RICS New Rules of Measurement Roadshow
Introductory seminar

for the CIOB on 6 May 2010
Introducing the

RICS New Rules of Measurement

Order of cost estimating and elemental cost planning

Stuart Earl
Subject matter

• RICS Measurement Initiative:
  – Existing standards.
  – Findings.
  – Recommendations.
  – Why change?

• RICS New Rules of Measurement:
  – Overview.
  – Key points.

• Benefits.

• Questions?
RICS Measurement initiative

Project overview
A suited set of rules for:

• Estimating- RIBA Work Stages A & B; OGC gateways 1 & 2

• Cost planning- Elements- RIBA Work Stages C – E; OGC Gateways 3A, 3B & 3C

• Works Procurement - RIBA Work Stages F – K; OGC Gateway 3C

• Maintenance Procurement - RIBA Work Stage L; OGC Gateways 4 & 5

All rules developed in consultation with Clients and Practitioners.
Existing standards (1)

- Since 1922, the Standard Method of Measurement (SMM) has provided quantity surveyors with rules of measurement for quantifying building works.
- Specifically drafted to advise quantity surveyors on how to measure building work items for inclusion in bills of quantities, for the purpose of obtaining a tender price for a building project.
Existing standards (2)

- BCIS Standard Form of Cost Analysis (SFCA):
  - First Edition – 1961
  - Second Edition - 1969
  - Third Edition - 2008

- Provides method for capturing, analysing and storing historical cost data.

- Cost data captured in a form that can be used for early cost advice.

- GIFA definition linked to RICS Code of Measurement.

- Elements defined by function.

- Developed when bills of quantities were main method of obtaining price.

- Cost data captured limited to construction costs.

BUT does not adequately address:

- Changes in procurement strategies.
- Modern day approach to compiling cost plans.
- Difficulties of capturing cost data; due to changes in procurement strategies.

Consequently, elemental cost data not captured in a form that can be readily used for modern procurement strategies.
Findings of the NRM Steering Group (1)

• No specific advice on the measurement of building works solely for the purpose of preparing cost estimates and cost plans existed.

• In the absence of such rules, quantity surveyors generally adopted the principles described in the SMM, SFCA or past practices to prepare cost estimates and cost plans.

• Resulting in an inconsistent approach to cost estimating and cost planning.
Findings from speaking to fellow professionals (2)

- What's more:
- Lost sight that measurement skills remain a core competence of today's quantity surveyor:
  - Estimating;
  - Procurement; and
  - Validation.
- Teaching of measurement (or quantification) on many University BSc degree courses found to be inadequate.
  - Measurement often divorced from construction technology!
- Graduates ill prepared when completed BSc degree:
  - No, or limited, appreciation of the importance of measurement.
  - Unable to complete simple measurement tasks.
Recommendations of the NRM Steering Group

• To develop a co-ordinated suite of measurement rules; dealing with all facets of measurement.

• Developed in consultation with Clients and Practitioners (both Consultants and Contractors).

• Based on UK practice.
  
  – BUT

• Have ‘worldwide’ application.
Current Status

- **NRM: Order of cost estimates and elemental cost planning:**
  - Effective date – 1 May 2009.

- **NRM: Construction quantities and works procurement:**
  - Final manuscript still being edited / developed.
  - Revised planned publication date 4 Qtr 10.

- **NRM: Maintenance and operation cost planning and procurement:**
  - Drafting and consultation to commenced 1 Qtr 09.
  - Revised planned publication date 4 Qtr 10.
Why change?

• Need to re-define the information that the Cost Manager (Quantity Surveyor) needs.

• Need to strengthen linkage between measurement and both RIBA Plan of Work and OGC Gateway Process.

• Client driven/ Industry driven – through changing procurement strategies:
  - Move towards Contractor design-led strategies (e.g. Design and Build).
  - Change in roles of contracting organisations (main contractor, works contractor, subcontractor, etc).

• Provide a modern toolkit for a C21 construction industry.

“It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one [most responsive] to change.”

Charles Darwin
RICS new rules of measurement

Order of cost estimating and elemental cost planning
Overview

• **Purpose:**
  
  – To provide a structured approach to developing cost estimates and cost plans.
  
  – To provide a common and consistent basis for measuring:
    
    • Areas;
    • Element unit quantities (EUQ); and
    • Elements, sub-elements, components.
  
  – To provide a common work breakdown structure (WBS) and cost breakdown structure (CBS) for a construction project.

• **Uses:**
  
  – Pre-construction cost management.
  
  – Order of cost estimates.
  
  – Cost planning.
  
  – Construction phase cost management.
  
  – Analysis of cost data.

• **Who will (should) use it?**
  
  – All those concerned with cost management of building projects.
  
  – Those generating business cases.
Key points (1)

- **Estimating and cost planning stages aligned to both:**
  - RIBA Work Stages; and
  - OGC Gateways.

- **Identifies ‘three’ formal cost planning stages.**

- **Recognises (Client defined) RIBA Work Stage C+.**

- **Re-structured elemental breakdown for cost planning.**

- **Defines:**
  - Building works.
  - Main Contractor’s Preliminaries.
  - Main Contractor’s OH&P.
  - Project/Design Team Fees.
  - Other Development/Project Costs.
  - Base Cost Estimate.
  - Risk.
  - Inflation.

- **Estimate base date**
  - The date on which the cost limit (excluding inflation) is established as a basis for calculating inflation.
Key points (2)

- **Describes:**
  - Structure of order of cost estimates and cost plans.
  - Constituents of a cost report.

- **Measurement:**
  - Uniform approach to area measurement (i.e. GIFA, NIA, Retail Areas, and Site Area (SA)).
    - RICS ‘Code of Measuring Practice: A guide for Property Professionals’.
  - Uniform approach to component measurement

- **Recognises that measurement is progressive:**
  - Order of cost estimates:
    - Floor area (measurement linked to RICS ‘Code of Measuring Practice’);
    - Functional unit; and
    - Elemental estimates (preliminary high level elemental cost model);
  - Cost plans (iterative process):
    - GIFA measurement;
    - Element; and
    - Component measurement.
    - Sub-component measurement (user defined).
Key points

• **Other advice:**
  
  – Project/ design team fees;
  
  – Other development/ project costs;
  
  – Capital Allowances, Land Remediation Relief and Grants; and
  
  – VAT Assessment.

• **Deals with ‘total’ costs of delivering a building project;**
  
  – ‘Not’ merely construction costs.

• **Divides cost estimates and cost plans into ‘five’ principal cost estimates:**
  
  1. Works estimate;
  
  2. Project/ design team fees estimate;
  
  3. Other development/ project costs estimate;
  
  4. Risk allowances estimate; and
  
  5. Inflation estimate.

• **Step by step guidance:**
  
  – Shows how to calculate each facet by use of algebraic formula.
Works cost estimate

- Building Works Estimate
- Main Contractor’s Preliminaries
- Main Contractor’s Overheads and Profit
Main contractor’s preliminaries + overheads and profit

- **Preliminaries:**
  - ‘... items which cannot be allocated to a specific element, sub-element or component.’
- Initial estimates of based on a percentage addition.
- Subsequent cost checks to be carried out on cost significant items.
- Subcontractors' preliminaries to be included in the unit rates applied to building works.

- **Overheads and profit:**
  - main contractor’s costs associated with head office administration proportioned to each building contract plus the main contractor’s return on capital investment.
- Estimates based on a percentage addition.
- Subcontractors' overheads and profit to be included in the unit rates applied to building works.
Project and design fees estimate

- Project and Design Team Fees
- Other Specialist Consultant Fees
- Main Contractor’s Pre-Construction Fees
- Main Contractor’s Design Fees (where Contractor-led Design)
Other development and project costs estimate

Other Development and Project Costs Estimate

Costs that are not directly associated with the cost of the building works, but form part of the total cost of the building project to the employer.
Risks (1)

- **Risk allowance:**
  - ‘The amount added to the base cost estimate for items that cannot be precisely predicted to arrive at the cost limit.’
- **NOT** a standard percentage.
- Properly considered assessment of the cost of dealing with risk should they occur.
- Four main categories (cost centres) defined:
  - Design development risks.
  - Construction risks.
  - Employer’s change risk.
  - Employer’s other risks.
- Cost manager responsible for managing risk allowances.
Risk allowance estimate

- Design Development Risks
- Construction Risks
- Employer’s Change Risk
- Employer’s Other Risks
Inflation estimate

- **Inflation Estimate**
  - **Tender Inflation/Deflation**: Period from the estimate base date to the date of tender return
  - **Construction Inflation/Deflation**: Period from the date of tender return to the mid-point of the construction period.
### Order of cost estimate framework

<table>
<thead>
<tr>
<th>Ref</th>
<th>Item</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Building Works</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Main Contractor Preliminaries</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Main Contractor Overheads and Profit</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Works Cost Estimate</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Project/ Design Team Fees</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Other Development/ Project Costs</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Base Estimate</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Risk Allowances:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Design Development Risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Risks</td>
<td></td>
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<tr>
<td></td>
<td>Employer Change Risks</td>
<td></td>
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<tr>
<td></td>
<td>Employer Other Risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cost Limit (excluding inflation)</strong></td>
<td></td>
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<tr>
<td>7</td>
<td>Inflation:</td>
<td></td>
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<tr>
<td></td>
<td>Tender Inflation</td>
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<tr>
<td></td>
<td>Construction Inflation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cost Limit (including inflation)</strong></td>
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</tbody>
</table>
## Cost plan framework

<table>
<thead>
<tr>
<th>Ref</th>
<th>Group Element</th>
<th>£</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Substructure</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Superstructure</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Internal Finishes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fittings, Furnishings and Equipment</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Services</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Completed Buildings and Building Units</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Work to Existing Buildings</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>External Works</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Facilitating Works</td>
<td></td>
</tr>
</tbody>
</table>

### Building Works Estimate

<table>
<thead>
<tr>
<th>Ref</th>
<th>Group Element</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Main Contractor Preliminaries</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Main Contractor Overheads and Profit</td>
<td></td>
</tr>
</tbody>
</table>

### Works Cost Estimate

<table>
<thead>
<tr>
<th>Ref</th>
<th>Group Element</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Project/ Design Team Fees</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Other Development/ Project Costs</td>
<td></td>
</tr>
</tbody>
</table>

### Base Estimate

<table>
<thead>
<tr>
<th>Ref</th>
<th>Group Element</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Risk Allowances:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Design Development Risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employer Change Risks</td>
<td></td>
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<tr>
<td></td>
<td>Employer Other Risks</td>
<td></td>
</tr>
</tbody>
</table>

### Cost Limit (excluding inflation)

<table>
<thead>
<tr>
<th>Ref</th>
<th>Group Element</th>
<th>£</th>
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</thead>
<tbody>
<tr>
<td>15</td>
<td>Inflation:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tender Inflation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Inflation</td>
<td></td>
</tr>
</tbody>
</table>

### Cost Limit (including inflation)
Order of cost estimates

• Quantification methods:
  – Floor area;
  – Functional unit; and
  – Elemental.

• Comprises tabulated rules for measuring EUQs for elemental cost estimates (elemental method).
  – Provides high level elemental cost model.

• Rules for measuring EUQs can be used for ‘analysing’ historical cost data.
  – Thereby completing ‘cost management cycle’.
## Elemental unit quantities

<table>
<thead>
<tr>
<th>Group element</th>
<th>Element</th>
<th>Unit</th>
<th>Measurement rules</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Substructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 2 Superstructure | 1 Frame | m²   | The area measured is the area of the floors related to the frame.  
2. The area of the frame shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA). |       |
| 2 Upper floors |        | m²   | The area measured is the total area of upper floor(s).  
2. The area of the upper floors shall be measured in accordance with the rules of measurement for ascertaining the gross internal floor area (GIFA).  
3. Sloping surfaces such as galleries, tiered terraces and the like are to be measured flat on plan.  
4. Areas for balconies, galleries, tiered terraces, service floors, walkways, internal horticultural areas and roofs to internal buildings shall be shown separately. | Where balconies are included, the sum of the upper floors and lowest floor will exceed the GIFA. |
| 3 Roof |        | m²   | The area measured is the area of the roof on plan.  
2. The area measured is the area of the roof on plan measured to the inside face of the external walls. |       |
| 4 Stairs and ramps |        | nr   | 1. Enumerate, giving total number of storey flights, i.e. the number of staircases or ramps multiplied by the number of floors served (excluding the lowest floor served in each case).  
2. The total vertical rise of each staircase or ramp is to be stated, measured from top of structural floor level to top of structural floor level. |       |
Cost plans

• **Hierarchy (framework) of standard elements (NOT FUNCTIONAL):**
  
  Based on four primary levels:
  
  – **Group element.**
  
  – **Element.**
  
  – **Sub-element.**
  
  – **Component.**

• **Tabulated rules of measurement.**

• **Cost significant items measured (80/20 Rule).**

• **Codified framework:**
  
  – For conversion to ‘work packages’ for procurement.
Building works (1)

Group element 2: Superstructure

Group element 2 comprises the following elements:

2.1 Frame
2.2 Upper floors
2.3 Roof
2.4 Stairs and ramps
2.5 External walls
2.6 Windows and external doors
2.7 Internal walls and partitions
2.8 Internal doors

Element 2.1: Frame

<table>
<thead>
<tr>
<th>Sub-element</th>
<th>Component</th>
<th>Unit</th>
<th>Measurement rules for components</th>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Steel frames</td>
<td>1. Structural steel frame, including fittings and fixings, details, including size of column grid (m), to be stated.</td>
<td>t</td>
<td>C1. The total mass of the steel frame is to be stated. The mass of framing includes all fittings and components.</td>
<td>1. Structural steel frame, including all components (e.g., columns, beams, composite columns and beams, lattice beams, braces, struts and the like).</td>
<td>1. Space frames and decks, including structural support framework (included in sub-element 2.1.2: Space frames/decks).</td>
</tr>
<tr>
<td></td>
<td>2. Fire protection to steel frame: details to be stated.</td>
<td>t</td>
<td>C2. The mass measured for fire protection and paint system is the total mass of the structural steel frame.</td>
<td>2. Fittings and fixings.</td>
<td>2. Specialist, proprietary and modular lightweight steel frame systems (included in sub-element 2.1.5: Specialist frames).</td>
</tr>
<tr>
<td></td>
<td>3. Factory applied paint systems: details to be stated.</td>
<td>t</td>
<td>C3. Work to existing buildings is to be described and identified separately.</td>
<td>3. Roof trusses which can be separated from the frame (included in sub-element 2.3.1: Roof structure).</td>
<td>3. Roof trusses which can be separated from the frame (included in sub-element 2.3.1: Roof structure).</td>
</tr>
</tbody>
</table>
Group element 9: Facilitating works

Group element 9 comprises the following elements:

9.1 Toxic/hazardous material removal
9.2 Major demolition works
9.3 Specialist groundworks
9.4 Temporary diversion works
9.5 Extraordinary site investigation works

Note: Works associated with general site preparation and groundworks, minor demolition works, and permanent roads, paths and pavings are included in group element 8: External works. The provision of temporary roads and services is included in group element 10: Main contractor’s preliminaries.

Element 9.1: Toxic/hazardous material removal

<table>
<thead>
<tr>
<th>Sub-element</th>
<th>Component</th>
<th>Unit</th>
<th>Measurement rules for components</th>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Toxic or hazardous material removal</td>
<td>1. Toxic or hazardous material removal details to be stated</td>
<td>item</td>
<td>C1. Cost significant components are to be described and identified separately. Such components are to be measured by area (m²), linear measurement (m) or enumerated (nr), separately.</td>
<td>1. Removal of toxic or hazardous parts of building fabric (e.g., asbestos). 2. Removal of toxic or hazardous insulating materials or components from existing services installations, including storage tanks and vessels.</td>
<td>1. Contaminated ground material removal or treatment (included in sub-element 9.1.2: Contaminated land). 2. Asbestos survey fees and the like (included in group element 12: Project/design team fees).</td>
</tr>
</tbody>
</table>
New Rules of Measurement – the benefits

What are the benefits?

[RICS ‘New rules of measurement: Order of cost estimating and elemental cost planning’]
Benefits (1)

• Training and education:
  – Promote common sense;
  – Invaluable ‘aide memoir’;
  – Help learning; and
  – Establish cost estimating and cost planning competencies.

• Approach:
  – Introduce formal estimating stages;
  – Present a clear framework; and
  – Provide a comprehensive work breakdown structure (WBS) and a cost break down structure (CBS) for cost estimates and cost plans.
Benefits (2)

• **Measurement:**
  - Recognise that measurement is progressive;
  - Uniform basis on which to measure areas;
  - Measurement of cost significant items (i.e. components); and
  - Uniform approach to measurement of components.

• **Modern construction:**
  - Deal with modern construction products and methods, including modular units and complete buildings; and
  - Consider sustainable construction.
Benefits (3)

- **Preliminaries:**
  - Define main contractor’s preliminaries.

- **Risk management:**
  - Dispense with the use of the generic term contingency;
  - Promote proper risk management;
  - Promote use (and management) of risk allowances; and
  - Define four categories of risk.

- **Inflation:**
  - Define two categories of inflation; and
  - Define measurement of inflation.
Benefits (4)

• **Cost management:**
  – Promotes budget setting using a cost limit, which includes allowances for risk;
  – Help establish more effective cost control systems;
  – Provide essential guidance on dealing with non-construction related costs; and
  – Provide advice on how to deal with VAT, taxation allowances, taxation relief and grants.

• **Accuracy of estimates:**
  – Define the information required by cost manager to produce cost estimates and cost plans at each formal estimating stage; and
  – Help improve the accuracy of cost estimates and cost plans.
Benefits

• **Innovative:**
  – Deal with the total cost of delivering a building project (total cost management).

• **Value management and value for money:**
  – Perform an essential part of a value for money framework;
  – Help underpin a business case for a building project;
  – Quantification of replacement components and building maintenance items;
  – Aid value management and value engineering processes;
  – Afford greater transparency;
  – Aid actual cost scrutiny; and
  – Encourage clear and effective communication.
Benefits (6)

• Procurement:
  – Provide a method for codifying elemental cost plans so that they can be converted to works packages for procurement; and
  – Aid cost management during the construction phase.

• Data acquisition, analysis and evaluation:
  – Provide robust basis for capturing historical cost data in the form required for future cost estimates and cost plans.

• Usability:
  – Can be easily computerised.

• The rules exemplify ‘RICS best practice’.
How is the BCIS going to address the need for cost data to be provided in a form that can be readily used for cost estimates and cost plans produced using the ‘RICS NRM’ Order of cost estimating and elemental cost planning’?

How are we practitioners going to support BCIS in achieving this?
Any further questions?