ice
Institution of Civil Engineers
Publishing

CESMM4 Revised: Examples

Mike Attridge

ice Publishing

Attridge Mike
ISBN 978-0-7277-6510-9
http://dx.doi.org/10.1680/cesmmfre.65109

Introduction

This publication is a sister publication to the *CESMM4 Revised: Handbook* (hereafter shortened to *CESMM4 Handbook*). The *CESMM4 Handbook* is a comprehensive guide to the preparation of a bill of quantities in accordance with the revised fourth edition of the *Civil Engineering Standard Method of Measurement* (hereafter shortened to CESMM4). All references to CESMM4 in this publication refer to this revised fourth edition, published in June 2019.

The foreword to the first edition of CESMM stated that the object of the committee tasked with producing it was to seek to

- standardise the layout and contents of bills of quantities prepared in accordance with CESMM
- provide a systematic structure of bill items leading to more uniform itemisation and description.

The principal focus of this publication is to explain how CESMM4 achieves these objectives by describing and illustrating how a bill of quantities prepared in accordance with CESMM4 should be structured and how items included in the bill should be compiled. With this knowledge, the larger part of the publication then provides sample pages from a hypothetical bill of quantities illustrating item descriptions that have been compiled in accordance with the principles and rules contained in CESMM4. Hereafter, 'Bill of Quantities' with capitals refers to a bill of quantities as defined in CESMM4.

1. The structure of the Bill of Quantities

CESMM4 provides mandatory direction as to how the Bill of Quantities should be structured. Paragraph 5.2 states that

> The Bill of Quantities shall be divided into the following sections.
>
> (*a*) List of principal quantities
> (*b*) Preamble
> (*c*) Daywork Schedule
> (*d*) Work items (grouped into parts)
> (*e*) Grand Summary.

Parts (*a*), (*b*), (*c*) and (*e*) should be relatively straightforward to prepare when read in conjunction with the associated paragraphs in section 5 of CESMM4.

It is part (*d*), the work items and the grouping of these into parts in the Bill of Quantities, that requires a little more thought.

Paragraph 5.9 of CESMM4 states that

> The items in the Bill of Quantities ... may be arranged in to numbered parts to distinguish between those parts of the work of which the nature, location, access, limitation on sequence or timing or any other special characteristic is thought likely to give rise to different methods of construction or considerations of cost.

The use of the word 'may' indicates that the arrangement of the Bill of Quantities into numbered parts is advisory and not mandatory, but if the advice is followed, paragraph 5.10 of CESMM4 states that

> Each part of the Bill of Quantities shall be given a heading and groups of items within each part be given sub-headings. Headings and sub-headings shall be read as part of the item descriptions to which they apply

By way of an example of how the advice given in paragraphs 5.2, 5.9 and 5.10 may be applied, Figure 1 illustrates the structure of a Bill of Quantities taken from a project for a large bascule (opening) bridge and associated approach roads in connection with a new crossing of a navigational waterway.

In this example, sections of this Bill of Quantities are identified by the letters A to E to distinguish them from the numbered parts into which the work items themselves are divided.

Although not shown in this example, some of the parts of this Bill of Quantities were broken down further into sub-parts – an example being parts 2.1 and 2.2, the approach viaducts, which were separated into the three structural components of most bridge structures, namely the abutments, the piers and the deck. Likewise, parts 6.1, 6.2 and 6.3 covering the highways were broken down further into the various elements typically associated with highway works such as demolition and site clearance, earthworks, drainage, roads and pavements, kerbs and footways, and so on.

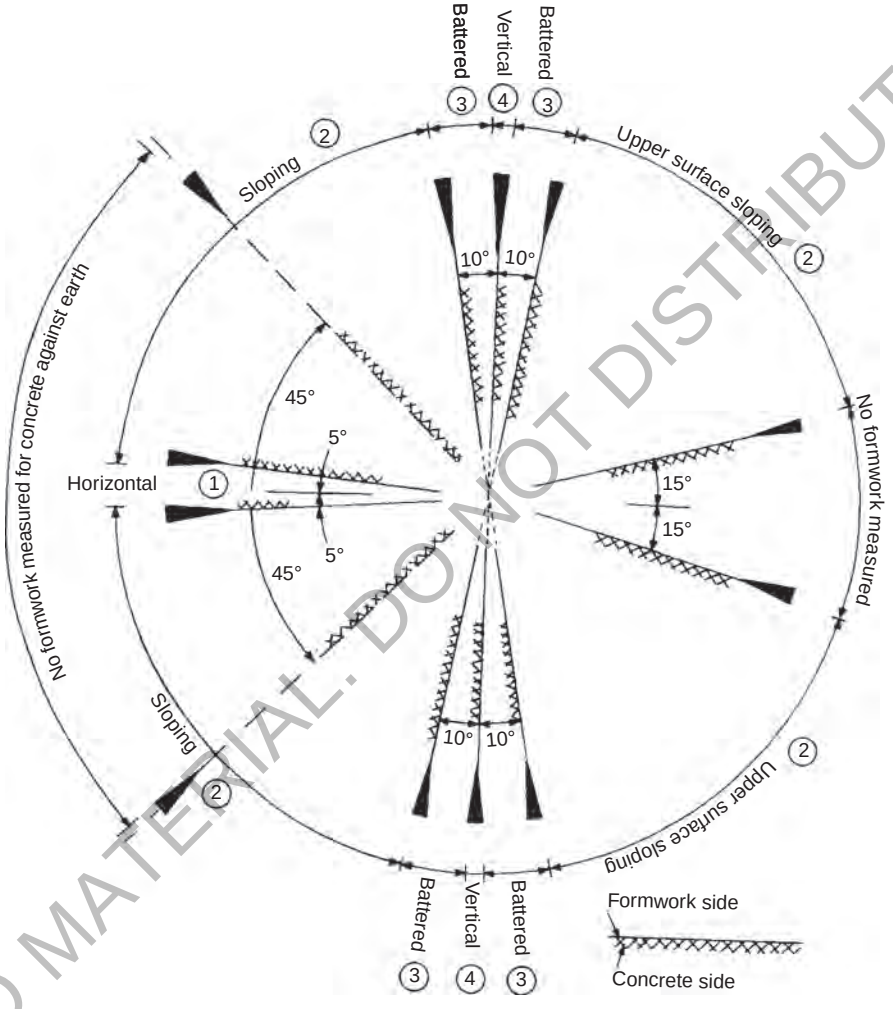
Having seen how the Bill of Quantities may be arranged into separate numbered parts, attention must then turn to how the items within each part should be grouped.

Figure 1 Structure of an example Bill of Quantities

Project: The River Deeping Road Crossing

Section A	**List of principal quantities**	
Section B	**Preamble**	
Section C	**Daywork Schedule**	
Section D	**Work items**	
	Part 1	**General items**
	Part 2	**Bridge structures** Part 2.1 – South approach viaduct Part 2.2 – North approach viaduct Part 2.3 – Rolling bascule bridge Part 2.4 – Southern approach embankment Part 2.5 – Northern approach embankment
	Part 3	**Control tower** Part 3.1 – Structure Part 3.2 – Architectural fit out Part 3.3 – Building services Part 3.4 – Compound external works
	Part 4	**Maritime** Part 4.1 – Dolphin structures Part 4.2 – Mooring pontoon Part 4.3 – Navigational aids
	Part 5	**MEICA** Part 5.1 – Mechanical systems Part 5.2 – Hydraulic systems Part 5.3 – Electrical systems
	Part 6	**Highways** Part 6.1 – South bank main carriageway Part 6.2 – South bank access roads Part 6.3 – North bank main carriageway
	Part 7	**Utilities**
	Part 8	**Accommodation works**
	Part 9	**Landscaping and ecology**
	Part 10	**Communications**
Section E	**Grand Summary**	

Figure G.1 Inclination zones for plane formwork defined in rules M2(e), M3, D1 and A2. Note the precise boundaries of the zones. For example, an inclination of 10° to the vertical is in zone 3; an inclination of 10.5° is in zone 2



PART 28. SITEWORKS

Number	Item description	Unit	Quantity	Rate	Amount	
					£	p
	PART 28. SITEWORKS.					
	EARTHWORKS.					
	General excavation.					
E411	Topsoil maximum depth not exceeding 0.25 m.	m^3	3482			
E424	Maximum depth 1–2 m.	m^3	25 234			
	Excavation ancillaries.					
E532	Disposal of excavated material.	m^3	9924			
	Filling.					
E624	Embankments; selected excavated material other than topsoil or rock.	m^3	15 310			
E641	Thickness; 150 mm excavated topsoil.	m^2	23 213			
E642	Thickness; 150 mm imported topsoil.	m^2	1573			
	Filling ancillaries.					
E711	Trimming of filled surfaces; topsoil.	m^2	17 036			
	Landscaping.					
E810	Turfing.	m^2	5700			
E830	Grass seeding upon a surface inclined at an angle to the horizontal exceeding 10°.	m^2	2050			
E860.1	Oak trees exceeding 5 m high.	nr	110			
E860.2	Sycamore trees exceeding 5 m high.	nr	120			
				PAGE TOTAL		

PART 4. SERVICE ROADS

Number	Item description	Unit	Quantity	Rate	Amount	
					£	p
	ROADS AND PAVINGS.					
	Unbound sub-base.					
R124	Type 2 unbound mixture depth 150 mm.	m^2	1039			
R160	Geotextile as specification clause R1/17.	m^2	1039			
R170	Additional depth of hardcore.	m^3	380			
	Concrete pavements.					
R534.1	Continuously reinforced concrete surface slabs depth 150 mm.	m^2	1039			
R534.2	Continuously reinforced concrete surface slabs depth 150 mm; inclined at an angle exceeding 10°.	m^2	1764			
R563	Steel fabric reinforcement to BS 4483 nominal mass 3–4 kg/m^2; type A252.	m^2	1039			
R580	Waterproof membrane below concrete pavements; 500 grade impermeable plastic sheeting.	m^2	1039			
	Joints in concrete pavements.					
R624	Expansion joints depth 100–150 mm; as detail C drawing 137/51 at 5 m centres.	m	321			
R634	Contraction joints depth 100–150 mm; as detail D drawing 137/51 at 2.5 m centres.	m	47			
	Kerbs, channels, edgings, footways and paved areas.					
R731	Precast concrete edgings to BS 7263-1 figure 1(m) straight or curved to radius exceeding 12 m; 200 × 200 mm concrete ST1 bed and haunch.	m	127			
R732	Precast concrete edgings to BS 7263-1 figure 1(m) curved to radius not exceeding 12 m; 200 × 200 mm concrete ST1 bed and haunch.	m	480			
R750.1	Precast concrete flags to BS 7263-1 type D depth 50 mm on type 2 unbound mixture bed depth 100 mm.	m^2	330			
R750.2	Precast concrete flags to BS 7263-1 type D depth 50 mm on type 2 unbound mixture bed depth 100 mm; inclined at an angle exceeding 10° to the horizontal.	m^2	390			
				PAGE TOTAL		

R