

**C4.2 CUT MATERIALS****PART C: MEASUREMENT AND PAYMENT****(i) Preamble**

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets, it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

**(ii) Items that will not be measured separately**

The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in the items describing the activity or in other items as deemed appropriate:

1. Excavation or undercut outside the specified dimensions or limits or the cutting slopes of the cuttings and excavations.
2. Backfill or cutting back the slope to remedy the overbreak or undercut that is caused by neglect, poor workmanship or inadequate supervision and management by the Contractor.
3. Removal of any material that has become unstable due to the Contractor's poor or inappropriate excavation and/or blasting methods, or any work and materials required to remedy the unstable areas.
4. Spoil of oversize material due to poor blasting or construction techniques.

**(iii) Items to be measured and paid for using items specified elsewhere in the specifications**

For activities in Table C4.2-1 items specified in other Sections of the specification, where they relate to work under this Section, will be listed in the Pricing Schedule.

**Table C4.2-1: Payment items from other Chapters or Sections**

Activity	Section 4.2 reference	Section item reference
Clearing, grubbing, removal of large trees, and removal of buildings and structures	A4.2.7.1d) and A4.2.7.2	C1.6.1 to C1.6.4 of Chapter 1
Conservation (excavating and stockpiling) of topsoil (including overburden less than 200 mm thick)	A4.2.7e)	C1.6.9 of Chapter 1
Blasting of hard material	A4.2.7.1m)	C12.10.1 of Chapter 12
Producing the material by crushing and screening	A4.2.7.1m)	Section C4.1 of Chapter 4 - All applicable items
Placing of topsoil, and vegetation	A4.2.7.1n)	Section C11.8 of Chapter 11 - All applicable items
Stockpiling the material	A4.2.7.2	Section C4.1 of Chapter 4 - All applicable items

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Hauling material (when applicable)

A4.2.7.1 and A4.2.7.2

C1.7.2 of Chapter 1

**(iv) Items specifically for this Section of the specifications**

<b>Item</b>	<b>Description</b>	<b>Unit</b>
<b>C4.2.1</b>	<b>Compiling and implementing M&amp;U plans for the cuttings</b>	

C4.2.1.1	Cuttings exceeding 5 000 m <sup>3</sup> up to 10 000 m <sup>3</sup>	number (No)
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C4.2.1.2	Cuttings exceeding 10 000 m <sup>3</sup> up to 20 000 m <sup>3</sup>	number (No)
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C4.2.1.3	Cuttings exceeding 20 000 m <sup>3</sup> up to 50 000 m <sup>3</sup>	number (No)
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C4.2.1.4	Cuttings exceeding 50 000 m <sup>3</sup> up to 100 000 m <sup>3</sup>	number (No)
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C4.2.1.5	Cuttings larger than 100 000 m <sup>3</sup>	number (No)
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The volume referred to in the description shall be the total volume of material in place that must be removed. It includes the volume of topsoil and overburden, the material compliant for earthworks and pavement layers and any spoil material.

The unit of measurement shall be the number of cuttings for which M&U plans have been compiled. A distinction shall be made between the various cuttings based on the total volume of material to be excavated in the cutting. When several cuttings between 5 000 m<sup>3</sup> and 10 000 m<sup>3</sup> are covered by a representative M&U plan they shall all be measured together as one plan.

The tendered rates shall include full compensation for gathering all information and compiling the plans, except for the additional material investigations agreed to by the Engineer that will be measured and paid separately, and to ensure implementing the plans during the operation of the cutting.

<b>Item</b>	<b>Description</b>	<b>Unit</b>
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<b>C4.2.2</b>	<b>Additional material investigations during the supplementary exploration</b>	
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C4.2.2.1	Cost of additional trial pits and/or drilling and laboratory testing	provisional sum
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C4.2.2.2	Handling costs and profit in respect of item C4.2.2.1	percentage (%)
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<b>Item</b>	<b>Description</b>	<b>Unit</b>
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<b>C4.2.3</b>	<b>Excavating of materials in cuttings, material obtained from</b>	
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C4.2.3.1	Soft excavation	cubic metre (m <sup>3</sup> )
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C4.2.3.2	Boulder excavation class A	cubic metre (m <sup>3</sup> )
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C4.2.3.3	Boulder excavation class B	cubic metre (m <sup>3</sup> )
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C4.2.3.4	Hard excavation (other than by blasting)	cubic metre (m <sup>3</sup> )
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C4.2.3.5	Hard excavation (by blasting)	cubic metre (m <sup>3</sup> )
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<b>Item</b>	<b>Description</b>	<b>Unit</b>
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Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



**C4.2.4 Excavating of materials in box cuts, material obtained from**

C4.2.4.1 Soft excavation	cubic metre (m <sup>3</sup> )
C4.2.4.2 Boulder excavation class A	cubic metre (m <sup>3</sup> )
C4.2.4.3 Boulder excavation class B	cubic metre (m <sup>3</sup> )
C4.2.4.4 Hard excavation (other than by blasting)	cubic metre (m <sup>3</sup> )
C4.2.4.5 Hard excavation (by blasting)	cubic metre (m <sup>3</sup> )

<b>Item</b>	<b>Description</b>	<b>Unit</b>
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**C4.2.5 Excavating of materials in designated excavations, material obtained from**

C4.2.5.1 Soft excavation	cubic metre (m <sup>3</sup> )
C4.2.5.2 Boulder excavation class A	cubic metre (m <sup>3</sup> )
C4.2.5.3 Boulder excavation class B	cubic metre (m <sup>3</sup> )
C4.2.5.4 Hard excavation (other than by blasting)	cubic metre (m <sup>3</sup> )
C4.2.5.5 Hard excavation (by blasting)	cubic metre (m <sup>3</sup> )

The unit of measurement for items C4.2.3, C4.2.4 and C4.2.5 shall be the cubic metre of material excavated for use on the road.

The volume shall be measured in place in its original position in the cutting, box cut or designated excavation. It shall be calculated from the difference between levels taken or topographical surveys carried out after the removal of the topsoil, and from levels taken or surveys done after completion of the excavation of the different material classes. The volume of classified unavoidable overbreak in hard or boulder material shall be included in the measurement.

For boulder material, the Engineer may approve that the quantities be measured in haul vehicles as an alternative when the boulder material cannot be identified accurately prior to excavating, by taking the in situ volume of the boulder material as equal to 50 % of the loose volume of the material in the haul vehicles.

The tendered rates for items C4.2.3, C4.2.4 and C4.2.5 shall include full compensation for breaking down the cut materials in the various classes to the specified maximum particle sizes, for excavating, and loading the material. Should the Contractor choose for designated excavations to temporarily place the excavated material next to the excavation for loading later, it shall not be considered as stockpile of material nor shall the loading be considered as a separate activity for compensation.

The excavation of hard material by blasting shall exclude the cost of blasting, which shall be measured and paid for under item C12.10.1 of Chapter 12.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



The excavating and disposing of unsuitable and spoil material shall be measured and paid for under item C4.2.7 and under item C4.2.8 or C4.2.9 as applicable.

Item	Description	Unit
<b>C4.2.6</b>	<b>Widening of existing cuttings</b>	
C4.2.6.1	Soft excavation	cubic metre (m <sup>3</sup> )
C4.2.6.2	Boulder excavation class A	cubic metre (m <sup>3</sup> )
C4.2.6.3	Boulder excavation class B	cubic metre (m <sup>3</sup> )
C4.2.6.4	Hard excavation (other than by blasting)	cubic metre (m <sup>3</sup> )
C4.2.6.5	Hard excavation (by blasting)	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material excavated during the widening of existing cuttings.

Widening of existing cuttings shall be a widening more than 2,5 m deep (measured vertically from the top of the cutting to the shoulder breakpoint), and where the cutting is widened by less than 4,0 m. Widening of existing cuttings larger than these dimensions shall be measured and paid for under item C4.2.3.

Measurement of the material shall be in place in the original position in the cutting, and the quantity shall be computed by the method of average end areas from surveyed cross-sections at intervals not exceeding 20 m measured along the centre line of the road or from topographical surveys, before and after removal of the material.

For boulder material, the Engineer may approve that the quantities be measured in haul vehicles as an alternative when the boulder material cannot be identified accurately prior to excavating, by taking the in situ volume of the boulder material as equal to 50 % of the loose volume of the material in the haul vehicles.

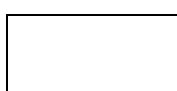
The tendered rates shall include full compensation for breaking down the various classes to the specified maximum particle sizes, excavating, and loading the material.

The excavation of hard material by blasting shall exclude the cost of blasting, which shall be measured and paid for under item C12.10.1 of Chapter 12.

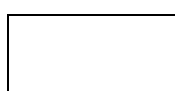
Item	Description	Unit
<b>C4.2.7</b>	<b>Removal of unsuitable stable cut material to spoil</b>	
C4.2.7.1	In layer thicknesses of 200 mm and less	cubic metre (m <sup>3</sup> )
C4.2.7.2	In layer thicknesses exceeding 200 mm	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material removed to spoil in accordance with the Engineer's instructions.

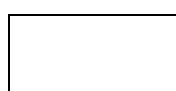
The volume shall be measured in place in its original position and shall be calculated in accordance with the authorized dimensions.



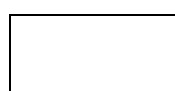
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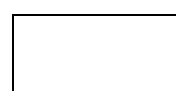
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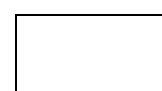
Witness 2



Employer



Witness 1



Witness 2



The tendered rates shall include full compensation for excavating and loading the material in the floor of the excavation, and for disposing the material. Payment under this item shall only be made when the material is removed in a separate excavation operation after the bulk excavation is completed on instruction by the Engineer, else the material shall be classified as spoil material and then measured and paid for under item C4.2.8 or C4.2.9 as applicable.

Haul shall be measured from the point where the material is loaded to where it is off-loaded.

Item	Description	Unit
<b>C4.2.8</b>	<b>Excavate material to spoil in sites designated by the Employer, material obtained from</b>	
C4.2.8.1	Soft excavation, overburden and unsuitable material	cubic metre (m <sup>3</sup> )
C4.2.8.2	Boulder excavation class A	cubic metre (m <sup>3</sup> )
C4.2.8.3	Boulder excavation class B	cubic metre (m <sup>3</sup> )
C4.2.8.4	Hard excavation (other than by blasting)	cubic metre (m <sup>3</sup> )
C4.2.8.5	Hard excavation (by blasting)	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material excavated and spoiled.

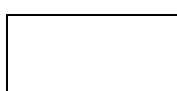
The quantities shall be measured in place in its original position in the cutting, box cut or designated excavation, and shall be computed from topographical surveys. The Engineer may approve that the quantities be measured in the haul vehicles as an alternative when the quantities of the spoil material cannot be calculated accurately prior to excavating, by taking the in situ volume of the material in the case of soft excavation as equal to 70 % of the loose volume of material in the haul vehicles, and in the case of boulder and hard material as equal to 50 % of the loose volume of material in the haul vehicles.

The tendered rates shall include full compensation for breaking down the various classes to sizes required for hauling, excavating and loading, and for off-loading and disposing the material, including shaping and levelling-off any heaps of spoil material.

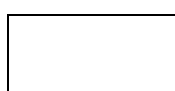
The excavation of hard material by blasting shall exclude the cost of blasting, which shall be measured and paid for under item C12.10.1 of Chapter 12.

Haul shall be measured from the point where the material is loaded to where it is off-loaded.

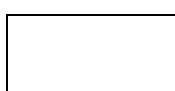
Item	Description	Unit
<b>C4.2.9</b>	<b>Excavate material to spoil in sites designated by the Contractor, material obtained from</b>	
C4.2.9.1	Soft excavation, overburden and unsuitable material	cubic metre (m <sup>3</sup> )
C4.2.9.2	Boulder excavation class A	cubic metre (m <sup>3</sup> )
C4.2.9.3	Boulder excavation class B	cubic metre (m <sup>3</sup> )
C4.2.9.4	Hard excavation (other than by blasting)	cubic metre (m <sup>3</sup> )



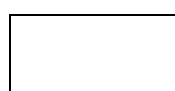
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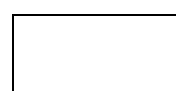
Witness 1



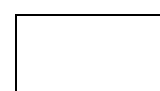
Witness 2



Employer



Witness 1



Witness 2



C4.2.9.5 Hard excavation (by blasting)

cubic metre  
(m<sup>3</sup>)

The unit of measurement shall be the cubic metre of material excavated and spoiled.

The quantities shall be measured in place in its original position in the cutting, box cut or designated excavation, and shall be computed from topographical surveys. The Engineer may approve that the quantities be measured in haul vehicles as an alternative when the spoil material cannot be identified accurately prior to excavating, by taking the in situ volume of the material in the case of soft excavation as equal to 70 % of the loose volume of material in the haul vehicles, and in the case of boulder and hard material as equal to 50 % of the loose volume of material in the haul vehicles.

The tendered rates shall include full compensation for negotiations with the landowner or legal occupant of the property or of the spoil site, for breaking down the various classes to sizes required for hauling, excavating, loading and hauling the material to the spoil sites irrespective of the haul distance, for off-loading and disposing the material, and for finishing the spoil site and obtaining the approval of the property or spoil site owner, if applicable.

The excavation of hard material by blasting shall exclude the cost of blasting, which shall be measured and paid for under item C12.10.1 of Chapter 12.

The tendered rates shall also include the cost of spoiling at a municipal site, if applicable.

All haul costs shall be included in the tendered rates of item C4.2.9.

Item	Description	Unit
<b>C4.2.10</b>	<b>Backfilling of the unavoidable overbreak in hard and boulder excavation</b>	
C4.2.10.1	Compliant gravel material	cubic metre (m <sup>3</sup> )
C4.2.10.2	Soil cement (stiff mix with 3 % cement)	cubic metre (m <sup>3</sup> )
C4.2.10.3	Soil cement (wet mix with 5 % cement)	cubic metre (m <sup>3</sup> )
C4.2.10.4	Concrete class 15 MPa	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material used in the backfilling.

The quantities shall be measured from the quantity of material placed in the overbreak.

The tendered rates shall include full compensation for providing the material, and for placing, backfilling and compacting the material in the overbreak.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Payment for backfilling of overbreak shall only be made when the Engineer approves that the overbreak was unavoidable.

Item	Description	Unit
<b>C4.2.11</b>	<b>Breaking down oversize material</b>	<b>cubic metre (m<sup>3</sup>)</b>

The unit of measurement shall be the cubic metre of oversize material that is broken down.

The quantity shall be measured by the volume of individual boulders or lumps of hard material. Where material is moved for breaking down the Engineer may approve that the quantity be measured by taking the volume to be equivalent to 50 % of the loose volume in the haul vehicles of the material to be broken down, as an alternative to measuring the individual volumes.

Breaking down of the cut material to the specified maximum particle sizes in Clause A4.2.7.1h) during the excavation operation or on the road by construction equipment shall not be measured under this item. Only further breaking down by conventional construction equipment of oversize cut material, as instructed or approved by the Engineer, shall be measured and paid.

The tendered rate shall include full compensation for breaking down the material.

No distinction shall be made between various methods of breaking down the oversize material.

No haul shall be paid where oversize material must be moved for breaking down.

Item	Description	Unit
<b>C4.2.12</b>	<b>Finishing the side slopes</b>	

C4.2.12.1 Cuttings:

- (a) In soft material      square metre (m<sup>2</sup>)
- (b) In boulder material class A and B square metre (m<sup>2</sup>)
- (c) In hard material      square metre (m<sup>2</sup>)
- (d) In soft material using labour enhanced methods of construction square metre (m<sup>2</sup>)

C4.2.12.2 Designated excavations      square metre (m<sup>2</sup>)

C4.2.12.3 Designated excavations using labour enhanced methods of construction square metre (m<sup>2</sup>)

The unit of measurement for cuttings shall be the square metre of the finished side slope areas.

The unit of measurement for designated excavations shall be the square metre of the side slope areas and the floor (invert) area where applicable.

The areas shall be measured from topographical surveys, or from tape measurements at 5,0 m cross section intervals where accurate tape measurements can be undertaken.

The tendered rates for finishing shall include full compensation for finishing the side slopes, and for loading, hauling and disposing of any excess material arising or brought down during the finishing operations. Placing of topsoil and vegetation shall be measured and paid separately.

Any haul costs shall be included in the tendered rates of item C4.2.12.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Specialised slope protection measures shall be measured and paid in Section 12.9 of Chapter 12.

*Tenderer*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*



### C4.3 EXISTING ROAD MATERIALS

#### PART C: MEASUREMENT AND PAYMENT

##### (i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the Conditions of Contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

Loading of the reclaimed material on the existing road and hauling it for use elsewhere shall be measured in Chapter 5.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets, it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

##### (ii) Items that will not be measured separately

There are no activities in Section A4.3 that will not be measured and paid separately and for which the cost must be included in other items.

##### (iii) Items to be measured and paid for using items elsewhere in the specifications

For activities in Table C4.3-1 items specified in other Sections of the specification, where they relate to work under this Section, will be listed in the Pricing Schedule.

**Table C4.3-1: Payment items from other Chapters or Sections**

Activity	Section 4.3 reference	Section item reference
Producing the material by crushing and screening	A4.3.2	Section C4.1 - All applicable items
Loading material	C4.3	C1.7.1 of Chapter 1
Hauling material (when applicable)	A4.3.7.11 and A4.3.7.12	C1.7.2 of Chapter 1
Stabilising the floor of reclaimed asphalt material stockpile site	A4.3.7.11	C5.4.2 of Chapter 5

##### (iv) Items specifically for this Section of the specifications

Item	Description	Unit
<b>C4.3.1</b>	<b>Additional material investigations</b>	
C4.3.1.1	Cost of additional core drilling and trial pits, sampling of asphalt and laboratory testing	provisional sum
C4.3.1.2	Handling cost and profit in respect of item C4.3.1.1	percentage (%)

Item	Description	Unit
<b>C4.3.2</b>	<b>Cleaning the existing road surface</b>	



Tenderer



Witness 1



Witness 2



Employer



Witness 1



Witness 2



C4.3.2.1 Cost to clean the road surface

provisional  
sum

C4.3.2.2 Handling costs and profit in respect of item C4.3.2.1

percentage  
(%)

Item	Description	Unit
C4.3.3	Removal of bituminous seal surfacing (thickness not exceeding 30 mm)	square metre (m <sup>2</sup> )

The unit of measurement shall be the square metre of seal surfacing removed separately.

The quantity shall be measured from the authorised dimensions.

The tendered rate shall include full compensation for blading or milling off the existing seal surfacing, and for loading and hauling the material to spoil sites identified by the Contractor.

All haul costs shall be included in the tendered rate of item C4.3.3.

The removal of a bituminous seal surfacing together with the underlying base layer shall not be measured in this item, but the cost shall be included with the excavation of the base layer under items C4.3.9 and C4.3.10 respectively.

Item	Description	Unit
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**C4.3.4 Saw-cutting existing materials within the following average depth ranges**

C4.3.4.1 Asphalt material:

- (a) Up to 50 mm                      metre (m)
- (b) Exceeding 50 mm and up to 100 mm                      metre (m)
- (c) Etc, in 50 mm increments

C4.3.4.2 Crushed stone and gravel material:

- (a) Up to 100 mm                      metre (m)
- (b) Exceeding 100 mm and up to 200 mm                      metre (m)
- (c) Etc, in 100 mm increments                      C4.3.4.3                      Cemented material:

(a) Up to 100 mm                      metre (m)

(b) Exceeding 100 mm and up to 200 mm                      metre (m)

(c) Etc, in 100 mm increments                      C4.3.4.4                      Concrete material:

- (a) Up to 50 mm                      metre (m)
- (b) Exceeding 50 mm and up to 100 mm                      metre (m)
- (c) Etc, in 50 mm increments

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



The unit of measurement shall be the metre of saw-cut. The length in each depth range shall be measured and paid separately.

The quantities shall be measured from the authorised length of saw-cut, and the depth specified or instructed by the Engineer.

The tendered rates shall include full compensation for saw-cutting the material.

Where asphalt and the underlying layer(s) are both to be saw-cut and the asphalt is less than 50 mm thick, separate measurement and payment shall not be made for the asphalt saw-cutting in item C4.3.4.1. The asphalt thickness shall then be added to the thickness of the material in items C4.3.4.2 and/or C4.3.4.3 as applicable.

Item	Description	Unit
<b>C4.3.5</b>	<b>Providing the milling machine on the site</b>	
C4.3.5.1	Small milling machine with a cutting width of 1,2 m or smaller	number (No)
C4.3.5.2	Large milling machine with a cutting width exceeding 1,2 m	number (No)

The unit of measurement shall be the number of milling machines provided on the site, or the number of times a milling machine is brought onto the site where it had to be removed temporarily with prior approval. De-establishment and subsequent re-establishment shall also only be measured if undertaken with prior approval.

The tendered rates shall include full compensation for establishment and for de-establishment of the milling machine.

Payment for returning the machine to the site after removal shall be made only where the removal was in accordance with the Contractor's approved programme of work and not for any other reason. Payment shall not be made for replacing any defective plant.

Payment shall also not be made for moving the milling machine around on the site.

Item	Description	Unit
<b>C4.3.6</b>	<b>Milling and removal of existing asphalt layers with an average milling depth (Contractor takes ownership)</b>	
C4.3.6.1	Not exceeding 50 mm	cubic metre (m <sup>3</sup> )
C4.3.6.2	Exceeding 50 mm but not exceeding 100 mm	cubic metre (m <sup>3</sup> )
C4.3.6.3	Exceeding 100 mm	cubic metre (m <sup>3</sup> )

Item	Description	Unit
<b>C4.3.7</b>	<b>Milling and removal of existing asphalt layers with an average milling depth (Employer takes ownership)</b>	
C4.3.7.1	Not exceeding 50 mm	cubic metre (m <sup>3</sup> )

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C4.3.7.2 Exceeding 50 mm but not exceeding 100 mm

cubic metre  
(m<sup>3</sup>)

C4.3.7.3 Exceeding 100 mm

cubic metre  
(m<sup>3</sup>)

The unit of measurement for items C4.3.6 and C4.3.7 shall be the cubic metre of material milled from the existing pavement.

The quantities shall be computed in accordance with the authorised dimensions of the excavation.

When instructed, split milling and removal of the different existing asphalt layers shall be measured individually.

The tendered rates for item C4.3.6 shall include full compensation for demarcating the excavation, for milling (excavating) the material, for loading and hauling to a site identified by the Contractor, and for spoil or re-use by the Contractor. All haul costs shall be included in the tendered rates of item C4.3.6.

The tendered rates for item C4.3.7 shall include full compensation for demarcating the excavation, for milling, loading, hauling and off-loading the material at a site designated by the Employer. Haul shall be measured from the point where the material is loaded to where it is off-loaded.

Trial milling shall be measured and paid for under items C4.3.6 or C4.3.7, and no separate payment shall be made for it.

Item	Description	Unit
<b>C4.3.8</b>	<b>Excavating material by milling</b>	
C4.3.8.1	Crushed stone material	cubic metre (m <sup>3</sup> )
C4.3.8.2	Cemented material	cubic metre (m <sup>3</sup> )
C4.3.8.3	Natural gravel material	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of milled material.

The quantities shall be measured in place on the existing road before the excavation commences.

The tendered rates shall include full compensation for milling out and loading the material.

Trial milling shall be measured and paid for under item C4.3.8, and no separate payment shall be made for it.

Item	Description	Unit
<b>C4.3.9</b>	<b>Excavating material by using conventional road construction equipment</b>	
C4.3.9.1	Asphalt material	cubic metre (m <sup>3</sup> )
C4.3.9.2	Crushed stone and macadam materials	cubic metre (m <sup>3</sup> )
C4.3.9.3	Cemented material	cubic metre (m <sup>3</sup> )
C4.3.9.4	Natural gravel and sand materials	cubic metre (m <sup>3</sup> )

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Witness 2



C4.3.9.5 Coarse fill and rock fill

cubic metre  
(m<sup>3</sup>)

The unit of measurement shall be the cubic metre of excavated material, by using conventional road building equipment.

The quantities shall be measured in place on the existing road before the excavation commenced.

The tendered rates shall include full compensation for excavating and loading the material.

The tendered rate for cemented material shall include for ripping or pulverising the material prior to excavating.

Item	Description	Unit
<b>C4.3.10</b>	<b>Excavating material by using labour enhanced methods of construction</b>	

C4.3.10.1	Asphalt material	cubic metre (m <sup>3</sup> )
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C4.3.10.2	Crushed stone and macadam materials	cubic metre (m <sup>3</sup> )
-----------	-------------------------------------	----------------------------------

C4.3.10.3	Cemented material	cubic metre (m <sup>3</sup> )
-----------	-------------------	----------------------------------

C4.3.10.4	Natural gravel and sand materials	cubic metre (m <sup>3</sup> )
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The unit of measurement shall be the cubic metre of excavated material, by using labour enhanced methods of construction.

The quantities shall be measured in place on the existing road before the excavation commenced.

The tendered rates shall include full compensation for excavating and loading the material.

Item	Description	Unit
------	-------------	------

**C4.3.11 Breaking down a stabilised layer by using conventional road construction equipment**  
cubic metre (m<sup>3</sup>)

The unit of measurement shall be the cubic metre of stabilised material that is broken down, by using conventional road building equipment.

The quantities shall be measured in place on the existing road, from thickness measurements determined by drilling cores or in trial pits.

The tendered rate shall include full compensation for all equipment, labour and supervision to break the stabilised layer. No distinction shall be made between ripping the material with a grader, or pulverising the material with a recycler or rotary machine.

Measurement and payment in this item shall only be made when the existing material is used in a side-cut to new pavement layer operation. For excavating the existing material and then remove it to stockpile or to spoil, measurement of item C4.3.9 shall apply that includes the breaking down by ripping or pulverising.

Item	Description	Unit
------	-------------	------

**C4.3.12 Removing of existing concrete material within the following average depth ranges**

C4.3.12.1 The break-up method:

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- (a) Not exceeding 150 mm      cubic metre (m<sup>3</sup>)
- (b) Exceeding 150 mm but not exceeding 250 mm      cubic metre (m<sup>3</sup>)

C4.3.12.2 The break-up method using labour enhanced methods of construction:

- (a) Not exceeding 75 mm      cubic metre (m<sup>3</sup>)
- (b) Exceeding 75 mm but not exceeding 200 mm      cubic metre (m<sup>3</sup>)

C4.3.12.3 The lift-out method:

- (a) Not exceeding 150 mm      cubic metre (m<sup>3</sup>)
- (b) Exceeding 150 mm but not exceeding 250 mm      cubic metre (m<sup>3</sup>)

The unit of measurement shall be the cubic metre of concrete removed.

The quantity shall be measured in place on the road or in the sidewalk before the concrete is broken up or lifted.

The tendered rates shall include full compensation for drilling of cores, and for removing and loading the concrete.

Item	Description	Unit
<b>C4.3.13 Lifting of existing paving blocks (specify the type or size and thickness)</b>		
C4.3.13.1	Using construction equipment	square metre (m <sup>2</sup> )
C4.3.13.2	Using labour enhanced methods of construction	square metre (m <sup>2</sup> )

The unit of measurement shall be the area of paving blocks lifted.

The quantities shall be measured in place on the road or in the sidewalk before the blocks are lifted.

The tendered rates shall include full compensation for lifting the paving blocks and for removing the bedding sand.

Distinction shall be made between the construction methods used.

Item	Description	Unit
<b>C4.3.14 Removing of existing road edging and services structures</b>		

C4.3.14.1 Removing of existing road edging using construction equipment:

- (a) Kerbing and edge beams:
  - (i) In situ concrete kerbing and edge beams      cubic metre (m<sup>3</sup>)
  - (ii) Precast concrete kerbing (specify type or figure number)      metre (m)
  - (iii) Precast concrete kerbing (specify type or figure number) and situ concrete channel      metre (m) (specify dimensions)

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- (b) Kerb inlets number (No)
- (c) Grid inlets number (No)
- (d) Etc., for other services structures number (No)

C4.3.14.2 Removing of existing road edging using labour enhanced methods of construction:

(a) Kerbing and edge beams:

- (i) In situ concrete kerbing and edge beams cubic metre (m<sup>3</sup>)
- (ii) Precast concrete kerbing (specify type or figure number) metre (m)
- (iii) Precast concrete kerbing (specify type or figure number) and situ concrete channel metre (m) (specify dimensions)
- (b) Kerb inlets number (No)
- (c) Grid inlets number (No)
- (d) Etc., for other services structures number (No)

The unit of measurement for items C4.3.14.1(a)(i) and C4.3.14.2(a)(i) shall be the cubic metre of concrete removed.

The unit of measurement for items C4.3.13.1(a)(ii) and (iii) and C4.3.14.2(a)(ii) and (iii) shall be the metre of precast kerbing removed. For items C4.3.14.1(a)(iii) and C4.3.14.2(a)(iii) the length of in situ concrete channel shall not be measured separately.

The unit of measurement for items C4.3.14.1(b) and (c) and C4.3.14.2(b), (c) and (d) shall be the number of inlets.

The quantities shall be measured in place on the road before the items are removed.

The tendered rates shall include full compensation for excavation, breaking down and removing the edging.

Distinction shall be made between the construction methods used.

Item	Description	Unit
<b>C4.3.15</b>	<b>Stockpiling of road layer materials</b>	
C4.3.15.1	Asphalt material	cubic metre (m <sup>3</sup> )
C4.3.15.2	Crushed stone material	cubic metre (m <sup>3</sup> )
C4.3.15.3	Cemented material	cubic metre (m <sup>3</sup> )
C4.3.15.4	Natural gravel material	cubic metre (m <sup>3</sup> )
C4.3.15.5	Concrete pavements	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material stockpiled.

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The quantities shall be measured in place on the road before excavation commenced.

The tendered rates shall include full compensation for hauling the first 1,0 km of milled or excavated material to the stockpile, and for spreading and maintaining the material in the stockpile.

Haul shall be measured starting 1,0 km from the centre point where the material is loaded to where it is off-loaded.

Item	Description	Unit
<b>C4.3.16</b>	<b>Stacking paving blocks and road edging</b>	
		number
C4.3.16.1	Paving blocks (specify type or size and thickness)	(No)
C4.3.16.2	Precast concrete kerbing (specify type or figure number and length of sections)	(No)
C4.3.16.3	Precast kerb inlets	number (No)
C4.3.16.4	Precast manholes	number (No)

The unit of measurement shall be the number of units that are neatly stacked at the approved stockpile site.

The quantities shall be measured in the stockpile (stack).

The tendered rates shall include full compensation for cleaning the paving blocks or road edging items, for loading and hauling to the stockpile (stacking) site or to a position as indicated by the land or property owner, for off-loading and stacking.

Any haul costs shall be included in the tendered rates of item C4.3.16.

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Employer

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Item	Description	Unit
<b>C4.3.17</b>	<b>Excavate non-compliant or excess pavement layer material to spoil in sites designated by the Employer, material consisting of</b>	
C4.3.17.1	Asphalt material	cubic metre (m <sup>3</sup> )
C4.3.17.2	Crushed stone, macadam, gravel and sand material	cubic metre (m <sup>3</sup> )
C4.3.17.3	Cemented material	cubic metre (m <sup>3</sup> )
C4.3.17.4	Concrete material	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material spoiled.

The quantity shall be measured in place on the road before excavation commenced. Where this method of quantification is not feasible or where the quality of material is only identified after it has been excavated, the Engineer may approve that the quantity be taken as equal to 70 % of the loose volume of the material in the haul vehicles be used to transport asphalt, crushed stone, macadam, gravel, sand and cemented materials, and in the case of concrete materials to 50 % of the loose volume of material in the haul vehicles.

The tendered rates shall include full compensation for breaking down the material, excavating, and for disposing the material, including shaping and levelling-off any heaps of spoil material.

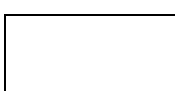
Haul shall be measured from the point where the material is loaded to where it is off-loaded.

Item	Description	Unit
<b>C4.3.18</b>	<b>Excavate non-compliant or excess pavement layer material to spoil in sites designated by the Contractor, material consisting of</b>	
C4.3.18.1	Asphalt material	cubic metre (m <sup>3</sup> )
C4.3.18.2	Crushed stone, macadam, gravel and sand material	cubic metre (m <sup>3</sup> )
C4.3.18.3	Cemented material	cubic metre (m <sup>3</sup> )
C4.3.18.4	Concrete material	cubic metre (m <sup>3</sup> )

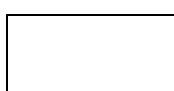
The unit of measurement shall be the cubic metre of material spoiled.

The quantity shall be measured in place on the road before excavation commenced. Where this method of quantification is not feasible or where the quality of material is only identified after it has been excavated, the Engineer may approve that the quantity be taken as equal to 70 % of the loose volume of the material in the haul vehicles.

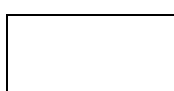
The tendered rates shall include full compensation for negotiations with the land owner or legal occupant of the property or of the spoil site, for breaking down the various materials, excavating, loading and hauling the material to the spoil sites irrespective of the haul distance, for off-loading and disposing the material, and for finishing the spoil site and obtaining the approval of the property or spoil site owner, if applicable.



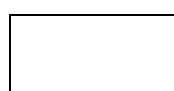
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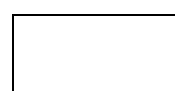
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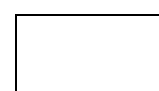
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Employer



Witness 1



Witness 2



The tendered rate shall also include the cost of spoiling at a municipal site, if applicable.

All haul costs shall be included in the tendered rates of item C4.3.18.

Item	Description	Unit
<b>C4.3.19</b>	<b>Spoiling of paving blocks and road edging in spoil sites designated by the Employer</b>	
C4.3.19.1	Paving blocks	cubic meter (m <sup>3</sup> )
C4.3.19.2	Precast and in situ concrete kerbing, edge beams and channels at precast kerbing	cubic metre (m <sup>3</sup> )
C4.3.19.3	Kerb and grid inlets, and other services structures	number (No)

The unit of measurement shall be the cubic metre of material spoiled.

The quantities shall be taken as equal to 70 % of the loose volume in the haul vehicles.

The tendered rates shall include full compensation for loading the materials, and for disposing the materials. The tendered rates shall also include the cost of spoiling at a municipal site, if applicable.

Haul shall be measured from the point where the material is loaded to where it is off-loaded.

Item	Description	Unit
<b>C4.3.20</b>	<b>Spoiling of paving blocks and road edging in spoil sites designated by the Contractor</b>	
C4.3.20.1	Paving blocks	cubic meter (m <sup>3</sup> )
C4.3.20.2	Precast and in situ concrete kerbing, edge beams and channels at precast kerbing	cubic metre (m <sup>3</sup> )
C4.3.20.3	Kerb and grid inlets, and other services structures	number (No)

The unit of measurement shall be the cubic metre of material spoiled.

The quantities shall be taken as equal to 70 % of the loose volume in the haul vehicles. The tendered rates shall include full compensation for loading the materials, for hauling to the spoil site irrespective of the haul distance, and for off-loading and disposing the materials.

The tendered rates shall also include the cost of spoiling at a municipal site, if applicable.

All haul costs shall be included in the tendered rates of item C4.3.20.

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Witness 1

Witness 2

Employer

Witness 1

Witness 2



**C4.4 COMMERCIAL MATERIALS  
PART C: MEASUREMENT AND PAYMENT**

**(i) Preamble**

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets, it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

**(ii) Items that will not be measured separately**

Loading of the commercial materials at the source, hauling it to the road, and off-loading will not be measured and paid for separately.

**(iii) Items to be measured and paid for using items specified elsewhere in the specifications**

For commercial materials from private or non-commercial suppliers identified by the Employer and that must still be excavated, produced and/or stockpiled, the Employer may decide to have a cost breakdown of the individual activities such as excavation, crushing and so forth. The pricing of item C4.4.1 will then not be applicable, and measurement and payment shall be made in accordance with the applicable items in Section C4.1.

**(iv) Items specifically for this Section of the specifications**

Item	Description	Unit
<b>C4.4.1</b>	<b>Commercial materials identified by the Employer from commercial, private or other non-commercial suppliers (specify the source(s))</b>	
	C4.4.1.1 Pavement layer material:	
	(a) Type G1 material	cubic metre (m <sup>3</sup> )
	(b) Type G2 material	cubic metre (m <sup>3</sup> )
	(c) – (l) Etc, for other Type G3 to G9 materials	cubic metre (m <sup>3</sup> )
	(m) Sand for the base and shoulder layers	cubic metre (m <sup>3</sup> )
	(n) Sand for a subbase layer	cubic metre (m <sup>3</sup> )
	(o) Sand for a selected layer	cubic metre (m <sup>3</sup> )
	(p) Natural or crushed gravel material for an unsealed shoulder layer	cubic metre (m <sup>3</sup> )

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Employer

Witness 1

Witness 2



- (q) Natural or crushed gravel material for the wearing course of an unsealed road cubic metre (m<sup>3</sup>)

C4.4.1.2 Macadam material:

- (a) Coarse aggregate cubic metre (m<sup>3</sup>)  
(b) Fine aggregate cubic metre (m<sup>3</sup>)

C4.4.1.3 Drainage blanket layer material cubic metre (m<sup>3</sup>)

C4.4.1.4 Soil cement material (pre-blended by the supplier) cubic metre (m<sup>3</sup>)

C4.4.1.5 Fill material in the earthworks:

- (a) Normal or coarse fill cubic metre (m<sup>3</sup>)  
(b) Rock fill cubic metre (m<sup>3</sup>)  
(c) Sand cubic metre (m<sup>3</sup>)

C4.4.1.6 Pioneer material cubic metre (m<sup>3</sup>)

The unit of measurement shall be the cubic metre of material.

The quantities for items C4.4.1.1 to C4.4.1.4 shall be measured in place in the compacted pavement layers and calculated from the authorised dimensions of the layers.

The quantities for item C4.4.1.5 shall be measured in place, from the difference between levelled cross sections at 20 m maximum intervals taken before and after the construction. The quantities shall not include excess material, overfill material or additional material placed for bulking (settlement during compaction).

The quantity for item C4.4.1.6 shall be taken as equal to 50 % of the loose volume of the material in the haul vehicles.

The tendered rates shall include full compensation for negotiations to procure and furnish the commercial materials, for loading the material at the source, hauling it to the road, and for off-loading. Temporary stockpiling of the material after procurement by the Contractor shall not be paid for.

The tendered rates for commercial materials from commercial suppliers shall also include full compensation for procuring the material. Additional crushing, screening and stockpiling of commercial material acquired from commercial suppliers shall not be measured and paid for separately.

For commercial materials from private or non-commercial suppliers, separate measurement and payment shall be made for breaking down oversize material, crushing, screening, and stockpiling as may be required and when specified in the Contract Documentation, or agreed to with prior written approval by the Engineer. Measurement and payment shall then be made according to the applicable items in Section C4.1. Procurement of the commercial material from the private or non-commercial suppliers by the Contractor, if specified in the Contract Documentation, shall be measured and paid for separately under item C4.4.3.

The materials from different sources shall be measured and paid separately.

All haul costs shall be included in the tendered rates of item C4.4.1.



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Witness 1



Witness 2



Employer



Witness 1



Witness 2



Item	Description	Unit
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#### C4.4.2 Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers

##### C4.4.2.1 Pavement layer material:

- |     |   |                               |
|-----|---|-------------------------------|
| (a) | Type G1 material  | cubic metre (m <sup>3</sup> ) |
| (b) | Type G2 material  | cubic metre (m <sup>3</sup> ) |
| (c) | – (l) Etc, for other Type G3 to G9 materials                                  | cubic metre (m <sup>3</sup> ) |
| (m) | Sand for the base and shoulder layers   | cubic metre (m <sup>3</sup> ) |
| (n) | Sand for a subbase layer  | cubic metre (m <sup>3</sup> ) |
| (o) | Sand for a selected layer   | cubic metre (m <sup>3</sup> ) |
| (p) | Natural or crushed gravel material for an unsealed shoulder layer             | cubic metre (m <sup>3</sup> ) |
| (q) | Natural or crushed gravel material for the wearing course of an unsealed road | cubic metre (m <sup>3</sup> ) |

##### C4.4.2.2 Macadam material:

- |     |                  |                               |
|-----|------------------|-------------------------------|
| (a) | Coarse aggregate | cubic metre (m <sup>3</sup> ) |
| (b) | Fine aggregate   | cubic metre (m <sup>3</sup> ) |

C4.4.2.3	Drainage blanket layer material	cubic metre (m <sup>3</sup> )
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C4.4.2.4	Soil cement material (pre-blended by the supplier)	cubic metre (m <sup>3</sup> )
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##### C4.4.2.5 Fill material in the earthworks:

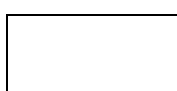
- |     |                       |                               |
|-----|-----------------------|-------------------------------|
| (a) | Normal or coarse fill | cubic metre (m <sup>3</sup> ) |
| (b) | Rock fill             | cubic metre (m <sup>3</sup> ) |
| (c) | Sand                  | cubic metre (m <sup>3</sup> ) |

C4.4.2.6	Pioneer material	cubic metre (m <sup>3</sup> )
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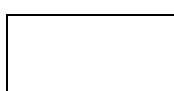
The unit of measurement shall be the cubic metre of material.

The quantities for items C4.4.2.1 to C4.4.2.4 shall be measured in place in the compacted pavement layers and calculated from the authorised dimensions of the layers.

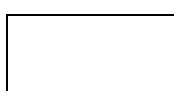
The quantities for item C4.4.2.5 shall be measured in place, from the difference between levelled cross sections at 20 m maximum intervals taken before and after the construction. The quantities shall not include excess material, overfill material or additional material placed for bulking (settlement during compaction).



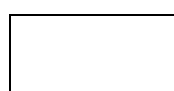
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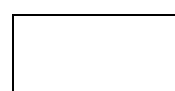
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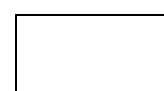
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Employer



Witness 1



Witness 2



The quantity for item C4.4.2.6 shall be taken as equal to 50 % of the loose volume of the material in the haul vehicles.

The tendered rates shall include full compensation for negotiations, taking of samples and laboratory testing of the natural material to prove compliance with the specified properties, procuring and furnishing the commercial materials, for loading the material at the source, hauling it to the road, and for off-loading. Temporary stockpiling of the material after procurement by the Contractor shall not be paid for.

When the commercial materials are identified and proposed by the Contractor as an alternative material source to those identified by the Employer, the tendered rates shall also include full compensation for taking of samples of the material, for laboratory testing of the natural material, and for the stabilisation design and providing and applying stabilising agents should they be necessary to improve the properties of the natural material to be compliant with the specifications.

No distinction shall be made for materials acquired from different sources.

All haul costs shall be included in the tendered rates of item C4.4.2.

Item	Description	Unit
<b>C4.4.3</b>	<b>Cost to procure commercial materials identified by the Employer from private or non-commercial sources</b>	

C4.4.3.1	Cost of procuring	provisional sum
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C4.4.3.2	Handling cost and profit in respect of item C4.4.3.1	percentage (%)
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Item	Description	Unit
<b>C4.4.4</b>	<b>Cementitious stabilising agents</b>	

C4.4.4.1	Cement	ton (t)
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C4.4.4.2	Road lime	ton (t)
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C4.4.4.3	Etc, for other agents	ton (t)
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The unit of measurement shall be the ton of stabilising agent.

The quantity of stabilising agent shall be determined in accordance with the authorised application rate. No over application or wastage shall be measured for payment.

The tendered rates shall include full compensation for procuring, transporting and delivering the stabilising agent to the site. No distinction shall be made between providing the stabilising agent in bulk or in pockets.

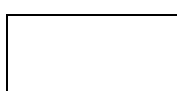
For providing the stabilising agent in pockets, the tendered rates shall also include full compensation for off-loading the pockets, for short term and/or long term storage.

All haul costs shall be included in the tendered rates of item C4.4.4.

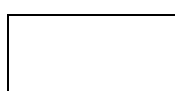
Placing, spreading and mixing in the stabilising agent(s) on the road shall be measured and paid for under the applicable items in Chapter 5.

Item	Description	Unit
<b>C4.4.5</b>	<b>Bituminous stabilising agents</b>	

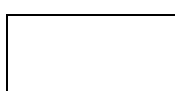
C4.4.5.1	Penetration grade bitumen (specify grade)	ton (t)
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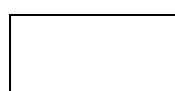
Tenderer



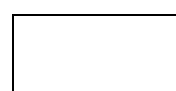
Witness 1



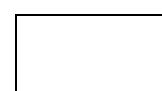
Witness 2



Employer



Witness 1



Witness 2



C4.4.5.2 Emulsion stable grade (specify type)

ton  
(t)

The unit of measurement shall be the ton of bituminous stabilising agent.

The method of calculating the quantity shall be specified in the Contract Documentation or as agreed between the Engineer and the Contractor, and shall be one of the following methods:

- Determined in accordance with the authorised application rate.
- Based on dipstick readings where the dipstick has been calibrated to the tanker, and the quantity measured at the applicable temperature.
- Based on assized weighbridge tickets issued for each and every tanker-load of stabilising agent consumed in the stabilisation process. The quantity thus measured shall not exceed the quantity calculated using the authorised application rate by more than 4 %.

The quantity shall include for a double treatment of stabilising agent over a nominal 150 mm overlap width along longitudinal joints.

The tendered rates shall include full compensation for procuring, transporting and delivering the bituminous stabilising agent to the site, for transfer into storage tanks, storage and heating, for issuing the required assized weighbridge ticket showing the mass of the contents in the tanker if applicable, for any re-heating required, for all wastage and for strict adherence to all safety measures required when handling warm bitumen emulsion or hot bitumen. No distinction shall be made for supplying the stabilising agent in bulk or in drums.

All haul costs shall be included in the tendered rates of item C4.4.5.

Using and applying the bituminous stabilising agent in the road layers shall be measured and paid for under the applicable items in Chapter 5.

Item	Description	Unit
<b>C4.4.6</b>	<b>Fillers for bituminous stabilisation (specify filler types separately)</b>	<b>ton (t)</b>

The unit of measurement shall be the ton of filler.

The quantity of filler shall be determined in accordance with the authorised application rate.

The tendered rate shall include full compensation for procuring and transporting the filler to the site, for off-loading and storing the filler.

Application of the filler and spreading on the road shall be measured and paid for under the applicable items in Chapter 5.

Item	Description	Unit
<b>C4.4.7</b>	<b>Sampling and material testing by a commercial laboratory for the stabilisation designs</b>	

C4.4.7.1 Cost of sampling and material testing

provisional  
sum

C4.4.7.2 Handling cost and profit in respect of item C4.4.7.1

percentage  
(%)

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2