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PROFORMA FOR ESTIMATING UNIT RATE OF RANDOM RUBBLE MASONRY USED IN CONSTRUCTION OF RIVER VALLEY PROJECTS

(Second Revision)

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BUREAU OF INDIAN STANDARDS
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(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 25 February 1987, after the draft finalized by the Cost Analysis and Cost Estimates Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 This standard was first published in 1968 and was revised in 1978 to incorporate certain modifications in Table 1 with a view to rationalizing the major operational characteristics and in this revision Appendices A and B have been excluded. The method of calculation of depreciation and estimated life of plant and machinery used in masonry is covered in IS : 11590 (Part 1)-1986*.

0.3 Unit rates of masonry available from various river valley projects in the country differ so widely in their structure that comparison of rates becomes impracticable. The variation in the unit rate of random rubble masonry occurs due to several factors, such as situation of work, wages of labourers, specifications of materials, cost of machinery and their repair charges, productivity, etc. It is, therefore, felt necessary to prepare a proforma for the estimation of the unit rate of masonry in such a manner as to take into account all the elements of costs that are expected to go into the item rate and present them in a uniform pattern so that the rates obtained in different projects can be compared and the item/items of operation difference is/are identified and understood.

*Guidelines for working out unit rate of cost of the construction equipment used for river valley projects : Part 1 General.

0.4 The unit rate of masonry will vary with the type of work and its specifications viz , masonry work in dams, CD works, structures less than one metre thick, course rubble masonry, uncourse rubble masonry, foundations, superstructure, etc. Separate proforma shall be prepared for each type of these works.

0.5 The proforma has been drawn up operation-wise and, as such, the depreciation of machinery, wages of labour including supervisory labour, etc, have all been taken into account in the costs of various operations indicated in the proforma.

0.6 The proforma presents the cost of different operations in their final shape. It does not show the details of the break-up of the costs of each operation. Besides this final proforma, a number of other proformae would be required to estimate and work out the costs of the different operation and elements that are indicated here in the final proforma. These supporting proformae have to be drawn up by the concerned project authorities or construction agencies according to their requirements.

0.7 Same proforma can be used for working out unit rates for other types of masonry by making suitable provisions for additional work involved. For example for face work, additional items to be accounted for, are dressing and pointing.

0.8 A separate proforma for estimating units rate scaffolding which is an important item in all structures where the work is carried out manually, is being prepared.

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1. SCOPE

1.1 This standard lays down the proforma for estimating unit rate of random rubble masonry.

2. PROFORMA

2.1 The proforma given in Table 1 is recommended for use in estimating unit rate of random rubble masonry used in construction of river valley projects.

TABLE 1 PROFORMA FOR ESTIMATING UNIT RATE OF RANDOM RUBBLE MASONRY

(*Clauses* 0.2 *and* 2.1)

Sl No.	Item	Unit	Quantity	Rate	Amount	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	*Rubble*					
	a) Royalty and other fees for quarrying					
	b) Removal of overburden					
	c) Quarrying					
	i) Drilling					
	ii) Blasting					
	iii) Dewatering (if required)					
	d) Breaking and sorting					
	e) Transport to the stockyard					
	f) Losses in transit, storage, handling, etc (percent)					
ii)	*Sand* (*fine aggregates*)					
	a) Royalty and other fees for quarrying					
	b) Removal of overburden					
	c) Quarrying or crushing and processing					
	d) Grading and washing					
	e) Transport to site					
	f) Transport from stockpiles to batching plant					
	g) Losses in transit, storage, handling, etc (percent)					
iii)	*Cement*					
	a) Cost at ex-factory					
	b) Rail or road transport and handling to site of work					
	c) Storage and handling up to batching plant					
	d) Losses in transit, storage, handling, etc (percent)					

(*Continued*)

TABLE 1 PROFORMA FOR ESTIMATING UNIT RATE OF RANDOM RUBBLE MASONRY — *Contd*

Sl No.	Item	Unit	Quantity	Rate	Amount	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
iv)	*Lime*					
	a) Cost at source of supply					
	b) Transport to site of work					
	c) Storage and handling up to mills					
	d) Quenching and sieving					
	e) Losses in transit, storage, handling, etc (percent)					
v)	*Admixtures*					
	a) Cost at ex-factory					
	b) Rail or road transport and handling to site of work					
	c) Storage and handling up to batching plant					
	d) Losses in transit, storage, handling, etc (percent)					
vi)	*Mixing af mortar*					
	a) Cost of manufacturing mortar					
vii)	*Lead and lift*					
viii)	*Laying and curing*					
	a) Scaffolding					
	b) Slurry					
	c) Laying					
	d) Curing					
ix)	*Overheads*					
	Proportional cost of the following overheads should be added on the item of unit rate random rubble masonry					
	a) Field Set Up					
	1) Buildings					
	2) Water supply, lighting, sanitary and drainage					
	3) Service road					
	4) Temporary constructions					

(*Continued*)

TABLE 1 PROFORMA FOR ESTIMATING UNIT RATE OF RANDOM RUBBLE MASONRY — *Contd*

Sl No.	Item	Unit	Quantity	Rate	Amount	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	b) Field Charges					
	1) Establishment expenditure (salary and office expenditure, inspection, vehicles, etc)					
	2) Compensation, retrenchment compensation, bonus, etc					
	3) Worksite amenities (medical, education recreation, etc)					
	4) Survey					
	5) Testing					
	6) Small T&P					
	7) Maintenance					
	8) Carriage and freight of machinery					
	9) Contingencies					
	c) Head Office and Financial Expenses					
	1) Dividend/return on capital					
	2) Interest charges					
	3) Head office changes including subordinate controlling office					
	4) Profit envisages					
	Total all — in rate					

NOTE 1 — The overhead expenses may be included as percentage of prime cost [items (i to viii)].

NOTE 2 — All the items mentioned above shall include depreciation, erection, operation and repairs, maintenance and dismantling of machinery where used. Unit rates of these can be estimated as per IS : 11590 (Part 1)-1986*.

*Guidelines for working out the unit rate of the construction equipment for river valley project : Part 1 General.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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