

IS : 4852 - 1987

*Indian Standard*

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

( *Second Revision* )

UD 627-81:057-003-12 ( 624-012 ) : 651-72

© Copyright 1987

BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

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

( *Second Revision* )

Cost Analysis and Cost Estimates Sectional Committee, BDC 63

*Chairman*

SHRI S. N. AGNIHOTRI  
710, Sector 11-B, Chandigarh

*Members*

SHRI S. N. ADHIKARI

SHRI N. K. MAZUMDAR (*Alternate*)

CHIEF ENGINEER ( MEDIUM IRRIGATION & DESIGNS )

ADDITIONAL CHIEF ENGINEER  
( *Alternate* )

CHIEF ENGINEER ( SPECIAL PROJECT )

SUPERINTENDING ENGINEER (*Alternate*)

CHIEF ENGINEER ( TDC )

DIRECTOR ( PD ) (*Alternate*)

DIRECTOR

DIRECTOR ( CMC )

DEPUTY DIRECTOR ( CMC ) (*Alternate*)

DIRECTOR ( R&C )

DEPUTY DIRECTOR ( R&C ) (*Alternate*)

SHRI J. DURAIRAJ

EXECUTIVE ENGINEER ( CIVIL )

*Representing*

Hindustan Steel Works Construction Ltd,  
Calcutta

Irrigation & Power Department, Government of  
Andhra Pradesh, Hyderabad

Irrigation Department, Government of  
Maharashtra, Pune

Irrigation Works, Government of Punjab,  
Chandigarh

Karnataka Power Corporation Ltd, Bangalore

Central Water Commission, New Delhi

Central Water Commission, New Delhi

In personal capacity ( *DI/141, Satya Marg,  
New Delhi* )

Kerala State Electricity Board, Trivandrum

( *Continued on page 2* )

© Copyright 1987

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* ( XIV of 1957 ) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( Continued from page 1 )

<i>Members</i>	<i>Representing</i>
SHRI P. C. GANDHI	Bhakra Beas Management Board, Sunder Nagar
SHRI H. S. NARULA ( <i>Alternate</i> )	
SHRI R. M. GUPTA	Roads Wing, Ministry of Shipping & Transport, New Delhi
SHRI R. S. MAHALAHA ( <i>Alternate</i> )	
SHRI S. S. IYENGAR	M. N. Dastur & Co (P) Ltd, Calcutta
SHRI S. B. JOSHI	S. B. Joshi & Co Ltd, Bombay
SHRI C. B. DHOPATE ( <i>Alternate</i> )	
SHRI A. V. KHANDEKAR	The Hindustan Construction Co Ltd, Bombay
SHRI A. B. AHERKAR ( <i>Alternate</i> )	
SHRI A. B. L. KULSHRESHTHA	Bureau of Public Enterprises, New Delhi
SHRI S. R. NIGAM ( <i>Alternate</i> )	
SHRI SAMIR LAHIRI	Continental Construction Ltd, New Delhi
SHRI SUJIT SEN ( <i>Alternate</i> )	
SHRI Y. G. PATEL	Patel Engineering Co Ltd, Bombay
SHRI A. S. SEKHON	Institution of Engineers, Chandigarh
SHRI K. SRINIVASAN	Directorate General Border Roads, New Delhi
SHRI KAMAL NAYAN TANEJA	National Projects Construction Ltd, New Delhi
SHRI B. CHOUDHURY ( <i>Alternate</i> )	
SHRI S. G. TASKAR	Construction Consultation Service, Bombay
SHRI D. A. KOTHARI ( <i>Alternate</i> )	
SHRI M. THYAGARAJAN	Indian Institute of Public Administration, New Delhi
SHRI G. RAMAN, Director ( Civ Engg )	Director General, BIS ( <i>Ex-officio Member</i> )

*Secretary*

SHRI M. SADASIVAM  
Assistant Director ( Civ Engg ), BIS

# *Indian Standard*

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

*( 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, uncoursed 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 unit rate scaffolding which is an important item in all structures where the work is carried out manually, is being prepared.

---

## **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)	<i>Rubble</i>					
	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)	<i>Sand ( fine aggregates )</i>					
	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)	<i>Cement</i>					
	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)	<i>Lime</i>					
	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)	<i>Admixtures</i>					
	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)	<i>Mixing of mortar</i>					
	a) Cost of manufacturing mortar					
vii)	<i>Lead and lift</i>					
viii)	<i>Laying and curing</i>					
	a) Scaffolding					
	b) Slurry					
	c) Laying					
	d) Curing					
ix)	<i>Overheads</i>					
	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

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
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

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
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 <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
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 <sup>2</sup>

# BUREAU OF INDIAN STANDARDS

## Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 3 31 01 31, 3 31 13 75

Telegrams: Manaksanstha  
( Common to all Offices )

## Regional Offices:

\*Western : Manakalaya, E9 MIDC, Marol, Andheri ( East ), BOMBAY 400093 Telephone  
6 32 92 95

†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054 36 24 99

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036 { 2 18 43  
3 16 41

Southern : C. I. T. Campus, MADRAS 600113 { 41 24 42  
41 25 19  
41 29 16

## Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001 { 2 63 48  
2 63 49

'F' Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002 22 48 05

Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003 6 67 16

Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002 5 36 27

53/5, Ward No. 29, R. G. Barua Road, 5th Byelane, GUWAHATI 781003 —

5-8-56C L. N. Gupta Marg (Nampally Station Road), HYDERABAD 500001 23 10 83

R14 Yudhister Marg, C Scheme, JAIPUR 302005 { 6 34 71  
6 98 32

117/418 B Sarvodaya Nagar, KANPUR 208005 { 21 68 76  
21 82 92

Patliputra Industrial Estate, PATNA 800013 6 23 05

Hantex Bldg ( 2nd Floor ), Railway Station Road, TRIVANDRUM 695001 7 66 37

## Inspection Offices ( With Sale Point ):

Pushpanjali, 205A West High Court Road, Bharampeth Extension, NAGPUR 440010 2 51 71

Institution of Engineers ( India ) Building, 1332 Shivaji Nagar, PUNE 411005 5 24 35

\*Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 89 65 28

†Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 27 68 00