

भारतीय मानक

नदी घाटी परियोजनाओं की पत्थर चिनाई के निर्माण में  
कार्य वस्तुओं के अनुमानित इकाई दर के लिए मार्गदर्शिका

*Indian Standard*

**GUIDELINES FOR ESTIMATING UNIT RATE OF ITEMS  
OF WORKS IN CONSTRUCTION OF RUBBLE  
MASONRY FOR RIVER VALLEY PROJECTS**

ICS 91.100.01; 93.160

© BIS 2000

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

## FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Cost Analysis and Cost Estimates Sectional Committee had been approved by the Water Resources Division Council.

Estimation of unit rate for different type of works in construction of rubble masonry for river valley projects is being done by various methods. It becomes very essential to follow certain guidelines during the process of estimation of unit rate, so that uniform methods are followed by concerned personnel.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## *Indian Standard*

# GUIDELINES FOR ESTIMATING UNIT RATE OF ITEMS OF WORKS IN CONSTRUCTION OF RUBBLE MASONRY FOR RIVER VALLEY PROJECTS

### 1 SCOPE

This Indian Standard stipulates general requirements for the estimation of unit rate of various items of work in construction of rubble masonry used in river valley projects.

### 2 REFERENCES

The following standards contain provision which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standards are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
269 : 1989	33 Grade ordinary Portland cement — Specification ( <i>fourth revision</i> )
455 : 1989	Portland slag cement — Specification ( <i>fourth revision</i> )
456 : 1978	Code of practice for plain and reinforced concrete ( <i>third revision</i> )
650 : 1991	Standard sand for testing cement — Specification ( <i>second revision</i> )
1489	Portland pozzolana cement:
(Part 1) : 1991	Flyash based — Specification ( <i>third revision</i> )
(Part 2) : 1991	Calcined clay based — Specification ( <i>third revision</i> )
1597	Code of practice for construction of stone masonry:
(Part 1) : 1992	Rubble stone masonry ( <i>first revision</i> )
(Part 2) : 1992	Ashlar masonry ( <i>first revision</i> )
2116 : 1980	Sand for masonry mortars — Specification ( <i>first revision</i> )
2250 : 1981	Code of practice for preparation and use of masonry mortars ( <i>first revision</i> )
3466 : 1988	Specification for masonry cement ( <i>second revision</i> )
4852 : 1987	Proforma for estimating unit rate of random rubble masonry used in construction of river valley projects ( <i>second revision</i> )
6909 : 1990	Specification for supersulphated cement
8112 : 1989	43 Grade ordinary Portland cement — Specification ( <i>first revision</i> )

<i>IS No.</i>	<i>Title</i>
8605 : 1977	Code of practice for construction of masonry in dams
9103 : 1979	Admixtures for concrete — Specification
12269 : 1987	53 Grade ordinary Portland cement — Specification

### 3 TERMINOLOGY

For the purpose of this standard, the definitions to terms defined in IS 1597 (Part 1) shall apply.

### 4 MATERIAL, PREPARATION AND LAYING OF MASONRY

The material used, preparation and laying of masonry shall conform to IS 1597 (Part 1).

### 5 UNIT RATE

#### 5.0 General

In order to arrive at the output norms for various classes of masonry, the stone masonry shall be classified, as one of the following or combination of various classes of works mentioned below :

- a) Cut stone in cement mortar
- b) Ashlar arching in cement mortar
- c) Rubble arching in cement mortar
- d) Coursed rubble in cement mortar — First sort
- e) Coursed rubble in cement mortar — Second sort
- f) Random rubble in cement mortar

#### 5.1 Unit Rate for Cement Mortar (1:X) — Rate for 1 cu m

The mix proportions for the cement mortar shall comply with requirement of IS 2250 or as directed by the engineer-in-charge, according to the nature and requirements of items of work involving cement mortar.

Mix proportion 1: X (containing X part of sand by volume to be taken as one cubic metre and one part of cement by volume to be taken as 1 440/X kilograms).

<i>Quantity</i>	<i>Description of Work</i>	<i>Unit</i>	<i>Rate</i>	<i>Amount</i>
1 440/X kg	Cement	1 tonne		
1 cu m	Sand	1 cu m		
1 cu m	Mixing charges for mortar	1 cu m		
	Sundries	Lumpsum		

**5.2 Unit Rate for Cut Stone in Cement Mortar (1:X)—Rate for 10 cu m**

Quantity	Description of Work	Unit	Rate	Amount
10.5 cu m	Cut stone roughly dressed to shape at quarry	1 cu m		
1.6 cu m	Cement mortar	1 cu m		
35.3 No.	Masons including stone cutter labour (10.6 No. I Class, 24.7 No. II Class)	Each		
35.5 No.	Mazdoors category I	Each		
28.2 No.	Mazdoors category II	Each		
	Sundries (For brushing, washing, raking, watering, curing, etc)	Lumpsum		

**NOTES**

1 For rates applying to floor works above first storey or lift above initial lift of 2 metres, the concerned schedule of rates applicable to the area and year of execution shall have to be adopted.

2 It should be noted that the labour including stone cutter allowed in the unit rate norms is for final stone dressing at work site and building. Rough dressing to cut stone size at quarry is to be included in the cost of the stone at quarry.

**5.3 Ashlar Arching in Cement Mortar (1:X) — Rate for 1 cu m**

Quantity	Description of Work	Unit	Rate	Amount
1 cu m	Rate for "Cut-stone in cement mortar" (1:X)	1 cu m		
1.4 No.	Extra masons — I Class Centering, etc	Each Lumpsum		

**5.4 Rubble Arching in Cement (1:X) — Rate for 10 cu m**

Quantity	Description of Work	Unit	Rate	Amount
11.50 cu m	Selected stones of sizes	1 cu m		
2.80 cu m	Cement mortar (1:X)	1 cu m		
42.4 No.	Masons including stone cutter (14.2 No. I Class, 28.2 No. II Class)	Each		
14.1 No.	Mazdoors category I	Each		

Quantity	Description of Work	Unit	Rate	Amount
28.2 No.	Mazdoors category II	Each		
Lumpsum	Centering and sundries	Lumpsum		
	Total			
	Rate for 1 cu m			

**5.5 Coursed Rubble in Cement Mortar (1:X) — First Sort — Rate for 10 cu m**

Quantity	Description of Work	Unit	Rate	Amount
11.0 cu m	Stone (including bond stones)	1 cu m		
2.8 cu m	Cement mortar (1:X)	1 cu m		
35.3 No.	Masons (including stone cutters vide standard specifications for dressing and rounding corners, etc	10.6 No. I Class 24.7 No. II Class	Each Each	
14.1 No.	Mazdoor category I	Each		
	Mazdoor category II	Each		
	Sundries	Lumpsum		

**5.6 Coursed Rubble in Cement Mortar (1:X) — Second Sort — Rate for 10 cu m**

Quantity	Description of Work	Unit	Rate	Amount
<sup>1)</sup> 6 cu m	Coursed rubble stone including bond stones	cu m		
<sup>1)</sup> 5 cu m	Rough stones	cu m		
3.2 cu m	Cement mortar (1:X)	cu m		
24.7	Masons (including stone cutters vide standard specifications for dressing and rounding corners, etc	7.1 No. I Class 17.6 No. II Class	Each Each	
14.1 No.	Mazdoor category II	Each		
	Sundries	Lumpsum		
	Total			
	Rate for 1 cu m			

<sup>1)</sup> The proportion may vary for various classes of stone and work specification.

**5.7 Random Rubble (Undressed and Brought to Course) in Cement Mortar (1:X) — Rate for 10 cu m**

<i>Quantity</i>	<i>Description of Work</i>	<i>Unit</i>	<i>Rate</i>	<i>Amount</i>
10.0 cu m	Rough stone	1 cu m		
1.0 cu m	Bond stone	1 cu m		
3.4 cu m	Cement mortar	1 cu m		
17.7 No.	Masons (including stone cutter			
	7.1 No. I Class	Each		
	10.6 No. II Class	Each		
14.1 No.	Mazdoors category I	Each		
14.1. No.	Mazdoors category II	Each		
	Sundries	Lumpsum		
	<b>Total</b>			
	<b>Rate for 1 cu m</b>			

**NOTES**

1 For 'Coping Work' — burnt stone on edge in mortar add 1.4 masons II Class for one cu m of finished work.

2 For well steining in this class of masonry add 1.4 masons — II class for one cu m of finished work.

3 Thirty eight (38) percent of mortar shall be adopted in the data for Random Rubble Masonry Work for construction of Dam and appurtenant works.

4 In individual cases and if warranted, the above percentage limit can be raised up to 40 (forty) percent by the Superintending Engineer-in-Charge of the work for recorded reasons.

5 The provisions for bond stones shall be deleted in the data for Random Rubble Masonry for dams and its appurtenant works.

For the purpose of notes (2) and (5) above :

- a) 'Dam' means hydraulic structure built across a stream to hold water.
- b) Appurtenant works of a masonry dam are the abutments, aprons, water cushions and retaining walls forming part of masonry dam.
- c) Diversion works like anicuts, head regulators can not be classified as Dams.

**5.8** Works for cornice, corbel stones and other ornamental finishes, the unit rates shall be decided by the Engineer-in-Charge, based on observed data at site of work for the specifications and drawings.

## Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

### Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

### Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. WRD 19 (255).

#### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

#### BUREAU OF INDIAN STANDARDS

##### Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002  
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha  
(Common to all offices)

##### Regional Offices :

##### Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg  
NEW DELHI 110 002

{ 323 76 17  
323 38 41

Eastern : 1/14 C. I.T. Scheme VII M, V. I. P. Road, Kankurgachi  
CALCUTTA 700 054

{ 337 84 99, 337 85 61  
337 86 26, 337 91 20

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160 022

{ 60 38 43  
60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600 113

{ 235 02 16, 235 04 42  
235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)  
MUMBAI 400 093

{ 832 92 95, 832 78 58  
832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE.  
FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR.  
LUCKNOW. NAGPUR. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM.