

BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

नदी घाटी परियोजनाओं में शॉटक्रेटिंग/गनिटिंग की इकाई दर विश्लेषण के लिए प्रोफार्मा

(IS 13419 का पहला पुनरीक्षण)

Draft Indian Standard

PROFORMA FOR ANALYSIS OF UNIT RATE OF SHOTCRETING/GUNITING IN RIVER VALLEY PROJECTS

(First Revision of IS 13419)

Measurement and Cost Analysis of Works for River Valley Projects Sectional Committee, WRD 23

**Last Date for Comments:
15 May 2022**

FOREWORD (*Formal clauses of the foreword will be added later*)

Shotcreting and guniting are versatile construction techniques proven for several decades. They are used without shuttering for horizontal, vertical and overhead surfaces of free shape. Shotcreting and guniting are two of the elements of modern underground excavation. Shotcreting and guniting are extensively used in river valley projects and as such it is essential that practices relating to their cost estimation are harmonious and uniform.

This standard was first published in 1992. The first revision of this standard has been brought out to bring the standard in sync with the latest field practices observed while using the standard and to bring it in the latest style and format of the Indian Standards. The major changes incorporated in this revision of the standard are:

- a) Relevant taxes and duties, wherever applicable, have been added in calculation of unit rates,
- b) Provisions for contractor's overheads and profits have been indicated,
- c) Provision for wire mesh use has been added, and
- d) Reference for IS 9012 has been given for variation of rebound during shotcreting.

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.

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1 SCOPE

This standard lays down proforma for analysis of unit rate of guniting/shotcreting used in river valley projects.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision 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 standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS</i>	<i>Title</i>
11590 : 1995	Guidelines for working out unit rate cost of the construction equipment used for river valley projects (<i>first revision</i>)
1566 : 1982	Specification for hard - Drawn steel wire fabric for concrete reinforcement (<i>second revision</i>)
9012 : 1978	Recommended practice for shotcreting

3 PROFORMA

3.1 The proforma for analysis of unit rate of guniting/shotcreting is given in Table 1. For evaluating unit rate of construction, equipment references should be made to IS 11590 : 1995. **The steel wire mesh, where used shall conform to IS 1566.**

TABLE 1
PROFORMA FOR ANALYSIS OF UNIT RATE FOR GUNITING/SHOTCRETING
(Clause 3.1)

SI. No. (1)	Item (2)	Unit (3)	Quantity (4)	Rate (5)	Amount (6)	Remarks (7)
i)	<i>Equipment</i>					
	a) Shotcreting machine	h				
	b) Compressed air	h				
	c) Batching and mixing plant	h				
	d) Mix conveying equipment	h				
	e) Water pump	h				
	f) Remote controlled spray (where applicable)	h				
	g) Mixing tanks and reciprocating Pump for mixing of liquid additives (where applicable)	h				
	h) Labour	Man hour				
ii)	<i>Total Cost of Equipment (C_E)</i>					
iii)	<i>Material</i>					
	a) Cement	Kg				
	b) Fine aggregate	Kg				
	c) Coarse aggregate	Kg				
	d) Water	Kg				
	e) Additives	Kg				
	f) Wire mesh	m ²				
iv)	<i>Total Cost of Material (C_m)</i>					
v)	<i>Curing</i>					

	a)	Membrane	Lump sum
	b)	Water	Kg
	c)	Labour	Man hour
vi)	<i>Total Cost of Curing (C_c)</i>		
vii)	<i>Overheads and Profits (Proportional cost of the following):</i>		
	a)	Water supply, lighting, sanitation and drainage	Lumpsum
	b)	Temporary construction	Lumpsum
	c)	Testing and supervision	Lumpsum
	d)	Carriage and freight of machinery	Lumpsum
	e)	Contingencies	Lumpsum
	f)	Hidden cost of labour	Lumpsum
	g)	<i>Taxes and duties:</i>	
		i. Tax on works	
		ii. Services tax	
		iii. Labour Cess	
		iv. VAT	
		v. Entry tax	
viii)	<i>Total Cost of Overheads and Profits (C_o)</i>		
ix)	<i>Analysis</i>		
	a)	Total quantity of shotcrete ¹⁾ = Q cum.	
	b)	Cost = C _E + C _M + C _C + C _O = C _T Rupees	
	c)	Additional cost for rebound (C _R in %) ²⁾	
	d)	Cost per cubic meter of shotcrete = $\frac{C_T + C_R}{Q}$	

NOTE —

- a) While comparing rates similarity of application of shotcrete, type, strength, etc are necessary.
- b) Reinforcement mesh, if used, shall be evaluated separately along with materials and labour required for the same.
- c) **Contractors overheads and profit may be decided suitably in the project.**
- d) ¹⁾ The total quantity of concrete includes anticipated rebound and additional quantity beyond payline).
- e) ²⁾ **For variation in rebound during shotcrete, refer IS 9012.**