**BUREAU OF INDIAN STANDARDS**



# भारतीय मानक मसौदा

## नदी घाटी परियोजनाओं में ग्राउटिंग की इकाई दर विश्लेषण के लिए प्रोफार्मा

(IS 13418 *का पहला पुनरीक्षण*)

# *Draft Indian Standard*

## PROFORMA FOR ANALYSIS OF UNIT RATE OF GROUTING IN RIVER VALLEY PROJECTS

(*First Revision of* IS 13418)

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

**Last Date for Comments: 21/05/2022**

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

Grouting is the process of injecting mixtures of cement slurry or other suitable materials into confined and inaccessible spaces (cracks and crevices) so that the whole formation may act as a monolithic mass to withstand the high pressures and loads to which it may be subjected. Grout materials include cement and sand, clay-cement, slag-cement, resin gypsum-cement, clays, asphalt, pulmen seal, fuel ash and a large number of other colloidal and low viscosity chemicals.

During construction, proper grouting can control ground water flow, prevent loose sand densification below adjacent structures due to pile driving and increase stability of granular soil below existing structures so as to reduce the need for lateral support. Grouting is extensively used in construction of river valley projects. As such projects are being executed all over the country, it is essential that practices relating to estimation of grouting cost are harmonized and uniform. This standard was formulated to lay down a proforma for analyzing unit rate for grouting so that a uniform approach is followed across different river valley projects.

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.

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.

# *Draft Indian Standard*

## PROFORMA FOR ANALYSIS OF UNIT RATE OF GROUTING USED IN RIVER VALLEY PROJECTS

(*First Revision of* IS 13418)

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

**Last Date for Comments: 21/05/2022**

## 1 SCOPE

This standard lays down proforma for analysis of unit rate of cement grouting with or without additives for use in river valley projects.

NOTE : The standard should be read in adjunct with IS 11590.

## 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:

| *IS No.* | *Title* |
|---|---|
| 11590 : 1995 | Guidelines for working out unit rate cost of the construction equipment used for river valley projects (*first revision*) |

## 3 PROFORMA

**3.1** The rate of grouting will involve two components, that is, drilling rate per metre of hole and grouting rate per kg of cement. The proformae are therefore given in Tables 1 and 2. For evaluating unit rate of construction equipment, references should be made to IS 11590.

## TABLE 1 PROFORMA FOR ANALYSIS OF UNIT RATE OF DRILLING FOR GROUTING

(*Clause* **3.1**)

| Sl. No. | Item | Unit | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| i) | *Drilling of Holes* : | | | | | |
| | a) Machinery and equipment excluding air | h | | | | |
| | b) Compressed air | h | | | | |
| | c) Drill bits and drilling accessories | h | | | | |
| | d) Other materials | | | | | |
| ii) | *Labour* : | man hours | | | | |
| iii) | *Overheads and Miscellaneous** : | | | | | |
| | a) Water supply, lighting, sanitary and drainage | lump sum | | | | |
| | b) Temporary construction | lump sum | | | | |
| | c) Testing and supervision | lump sum | | | | |
| | d) Carriage and freight of machinery | lump sum | | | | |
| | e) Hidden cost of labour | lump sum | | | | |
| | f) Contingencies | lump sum | | | | |
| iv) | *Taxes and Duties* : | | | | | |
| | a) Tax on works | | | | | |
| | b) Services tax | | | | | |
| | c) Labour Cess | | | | | |
| | d) VAT | | | | | |
| | e) Entry tax | | | | | |
| v) | *Analysis* : | | | | | |

a) Total cost of drilling ($C_d$) = Cost of drilling of holes + Cost of labour + Cost of overheads and miscellaneous + Taxes and duties

b) Total length of holes = $L$ m

c) Cost of drilling/m drilled = $\frac{C_d}{L}$

NOTE :

1) *Contractors overheads and profit may be decided suitably in the project.

**TABLE 2 PROFORMA FOR ANALYSIS OF UNIT RATE-OF GROUTING PER KG OF CEMENT**
*(Clause* **3.1***)*

| **Sl. No.** | **Item** | **Unit** | **Quantity** | **Rate** | **Amount** | **Remarks** |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| i) | *Grouting Equipment* : | | | | | |
| | a) Grout mixer | h | | | | |
| | b) Grout pump and accessories | h | | | | |
| | c) Compressed air | h | | | | |
| ii) | *Cost of Grout Materials* : | | | | | |
| | a) Cement | Kg | | | | |
| | b) Sand | Kg | | | | |
| | c) Additives | Kg | | | | |
| | d) Water | Kg | | | | |
| iii) | *Washing and Testing of Holes* : | | | | | |
| | Water pump and/or compressed air charges | h | | | | |
| | a) Washing the holes | | | | | |
| | b) Testing of holes | | | | | |
| iv) | *Labour* : | Man hours | | | | |
| v) | *Overheads and Miscellaneous** : | | | | | |
| | a) Water supply, lighting sanitary and drainage | Lumpsum | | | | |
| | b) Temporary construction | Lumpsum | | | | |

| | | |
|---|---|---|
| c) | Testing and supervision | Lumpsum |
| d) | Carriage and freight of machinery | Lumpsum |
| e) | Hidden cost of labour | Lumpsum |
| f) | Contingencies | Lumpsum |

vi) *Taxes and Duties* :

i. Sales Tax on works
ii. Services tax
iii. Labour Cess
iv. VAT
v. Entry tax

viii) *Analysis*

a) Total cost of grouting ($Cg$ ) = Cost of grouting equipment + Cost of grouting materials + Cost for washing and testing of holes + Cost of labour + Cost of overheads and miscellaneous + Taxes and duties

b) Total quantity of cement used ($w$) Kg

c) Cost of grouting/kg of cement = $\frac{Cg}{w}$

NOTE

1. Separate rate analysis should be worked out for any change in grout mix or type of grouting.
2. *Contractors overheads and profit may be decided suitably in the project.