



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

STANDARD DATA BOOK FOR ANALYSIS OF RATES

(Second Revision-2019)



Image -

Volume-II: For Hilly Terrain

Published by:

Indian Roads Congress (IRC)
on behalf of the Govt. of India
Ministry of Road Transport & Highways
New Delhi

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FOREWORD TO THE SECOND REVISION

I have great pleasure to present the second revised edition of MoRT&H's Standard Data Book for Analysis of Rates for Road, Bridge and Tunnel Works.

MoRT&H's Standard Data Book (SDB) for Analysis of Rates for Road and Bridge Works published by Indian Roads Congress (IRC), was first brought out by MoRT&H in 1994 and then revised in June 2003 based on Ministry's specification for Road & Bridge Works (Fourth Revision - 2001) and relevant IRC codes/guidelines/circulars. Since then analysis of rates and estimates for National Highway Works are prepared on the basis of the Data Book. This scientific approach provides for uniformity in inputs for various items of works, besides standardization in nomenclature. Further, its compatibility with the specifications of work is ensured, which had been changed to equipment intensive construction in around 1985 from labour-intensive construction methods. The later still forms the basis for analysis of rates adapted by State PWDs. Owing to its merits; Ministry's Standard Data Book is being adopted by various agencies for projects other than National Highways.

However, a need had been felt for revision and updation of the Standard Data Book on account of the following:

- a) Technological upgradation as per currently revised MoRT&H Specification for Road and Bridge Works in 2013.
- b) Increased level of mechanization.
- c) Changes in size, capacity and types of equipment since 2003.
- d) Rationalisation in overheads and contractor's profit, based on use of machineries at various project sizes.
- e) Inclusion of new Chapter 15 for Box Cell Structure , Chapter 18 for Road Tunnel Works and Chapter 19 for Environmental & Safety Management and Bio Engineering.
- f) Other new items pertaining to new technology and material for construction of Roads, Bridges and Tunnel works have been added in the existing chapters.
- g) Output efficiency of machineries and labour has been considered depending upon the type of terrain like plain, rolling and hilly. Accordingly two volume i.e. Vol.-I for plain/rolling terrain and Vol.-II for hilly terrain of Standard Data Book are published.
- h) Keeping in view the size of the project and type of machineries being used for various works, rate analysis will be worked out under three category of projects classified as Small Project (Civil Works Cost less than INR 200 Cr.), Medium Project (Civil Works Cost Greater than INR 200 Cr. and less than INR 500 Cr.) and Large Project (Civil Works Cost greater than INR 500 Cr.).

This second revised edition of Standard Data Book has been finalized in record time with proper research, analysis and validation, along with a user-friendly web based software for efficient application use. This would not have been possible without untiring efforts of concerned officers and other officials of Ministry of Road Transport & Highways, Indian Roads Congress (IRC), NHAI, NHIDCL and LEA Associates South Asia Pvt. Ltd. New Delhi consultant engaged for this work. I would like to express my appreciation to Committee comprising of Mr. I.K Pandey, DG(RD) & SS, MoRT&H - Chairman, Mr. B.K. Sinha, C.E. MoRT&H, Mr. V.K. Rajavat, Director NHIDCL, Mr. Sanjeev Kumar, C.E. MoRT&H, Mr. Khushal Chand, C.E. MoRT&H, Mr. S.K. Nirmal, Secretary General IRC and Mr. Anil

Khare, GM (Tech.) NHAI. This Standard Data Book along with facility to create Schedule of Rates at District level of each State & UTs and preparation of Cost Estimates is available at MORT&H web site as well at web portal www.sdb.morth.gov.in. I also like to give special thanks to Mr. B.N Singh, Former DG(RD)&SS, MoRT&H, and Mr. R.K Pandey Member (Projects) NHAI for their contribution in finalization of this Standard Data Book.

I am sure this Standard Data Book, in its present form, would prove to be very useful to all practicing Highway Engineers. The Standard Data Book, however, needs to be updated periodically with changes of technology and environment. The Ministry of Road Transport & Highway would, therefore welcome the feedback/suggestions from users, so that any further amplification/modification/updating may be attempted in due course.



(I.K. Pandey)

New Delhi
October, 2019

Director General (Road Development)
& Special Secretary to the Govt. of India

ABBREVIATIONS

Abbreviations of unit wherever occurring in the 'Standard Data Book' are as under

ATMS	ADVANCED TRAFFIC MANAGEMENT SYSTEMS
BC	BITUMINOUS CONCRETE
BM	BITUMINOUS MACADAM
CP	CONTRACTOR'S PROFIT
CM	CENTIMETER
DBM	DENSE BITUMINOUS MACADAM
DIA	DIAMETER
EG	FOR EXAMPLE
ETC.	ET CETERA
FE LOADER	FRONT END LOADER
GI	GALVANISED IRON
GL	GROUND LEVEL
GM	GRAM
HA	HECTARE
HTMS	HIGHWAY TRAFFIC MANAGEMENT SYSTEMS
HMP	HOT MIX PLANT
HR	HOUR
HYSD	HIGH YIELDING STRENGTH DEFORMED
I.E. / IE	THAT IS
IRC	INDIAN ROADS CONGRESS
IS	INDIAN STANDARD
KG	KILOGRAM
KL	KILOLITER
KM	KILOMETER
KMPH	KILOMETER PER HOUR
L	LITER
L1 TO L10	LEAD IN KILOMETER
M	METER
MG	MILIGRAM
MIN	MINIMUM
MAX	MAXIMUM
MM	MILLIMETER

MORT&H	MINISTRY OF ROAD TRANSPORTATION & HIGHWAYS
MS	MILD STEEL
MT	METRIC TONNE
NO./NR.	NUMBER
OH	OVERHEAD
OMC	OPTIMUM MOISTURE CONTENT
PCC / P.C.C.	PLAIN CEMENT CONCRETE
Q	QUINTAL
RCC / R.C.C.	REINFORCED CEMENT CONCRETE
REF. To M	REFERENCE TO MORT&H SPECIFICATION
RM	RUNNING METER
RR	ROAD ROLLER
RS	RUPEES
SMA	STONE MATRIX ASPHALT
SL./SR. NO.	SERIAL NUMBER
SQM. KM	SQUARE KILOMETER
SQM/M2	SQUARE METER
T	TONNE
T & P	TOOLS & PLANT
T.KM	TONNE KILOMETER
TM	TRANSIT MIXTURE
TPH	TONNE PER HOUR
WBM	WATER BOUND MACADAM
WMM	WET MIX MACADAM

Note:- i). The all abbreviations signify both singular as well as plural number.

ii). The all abbreviations signify both small letter as well as capital letter.

BASIC INPUT PARAMETER

Overhead and Contractor Profit

Sl. No.	Description	Percentage		
		Large Project	Medium Project	Small Project
1	Overheads for Road Works	10%	12%	15%
2	Contractors profit for Road Works	10%	10%	10%
3	Overheads for Bridge Works	25%	25%	25%
4	Overheads for Bridge Works (Rehabilitation)	30%	30%	30%
5	Contractors profit for Bridge Works	10%	10%	10%
6	Overheads for Road Tunnel Works	25%	25%	25%
7	Contractors profit for Tunnel Works	10%	10%	10%

Lead Details

Sl. No.	Description	Represent lead
1	Lead from Mixing Plant to working site	L1
2	Lead for Earthwork borrow area to site	L2
3	Lead for Moorum/ Natural Granular material borrow area to site	L3
4	Lead for fly ash from source to site	L4
5	Lead for Sand from source to site	L5
6	Lead for Sand from source to Plant	L6
7	Lead for Aggregate from Quarry to working site	L7
8	Lead for Aggregate from Quarry to Plant	L8
9	Lead for Bitumen from source to Plant	L9
10	Lead for HT Strands from source to Plant	L10

Note: All lead in km (one way).

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PART –A

ROAD WORKS

A. ROAD WORKS

BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

The basic approach for the preparation of Standard Data Book for Road Works is indicated as under:

Description of items

- 1 The description of items are given briefly and linked with the relevant clauses of the MoRT&H Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretations.

- 2 **Mechanical Means**

Due to intensive mechanization with higher size/capacity of machines in construction work, rate analysis for various items has been prepared using mechanical means. However, manual inputs have been enhanced for certain cases, where areas may be inaccessible for large size machines or quantum of work may not be large enough to justify use of large machines.

- 3 **Overhead Charges**

The overhead charges include the following elements:

- i. Site office & accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Office furniture, equipment and communications
- iii. Expenditure on
 - Corporate office of contractor
 - Site supervision
 - Documentation and "as built" drawings
- iv. Mobilisation / de-mobilisation of resources
- v. Labour camps with basic amenities and transportation to work sites
- vi. Light vehicles for site supervision including administrative and managerial requirements
- vii. Laboratory equipment and quality control including field and laboratory testing
- viii. Minor T&P and survey instruments and setting out works, including verification of line, dimensions, trial pits and bore holes, where required
- ix. Temporary Diversion with Safety measures
- x. Watch and ward
- xi. Traffic management & Safety during construction
- xii. Expenditure on 'safeguarding environment
- xiii. Sundries
- xiv. Financing Expenditure
- xv. Insurance/compensation

- 3.1 Overhead Charges are considered depending upon the size of the projects as under:

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(i) Civil Works Cost up to Rs. 200 crores	15 percent
(ii) Civil Works Cost > Rs. 200 crores and ≤ Rs.500 Crores	12 percent
(iii) Civil Works Cost > Rs. 500 crores	10 percent

Civil works cost is excluding GST.

- 4 **Contractor Profit :** 10 percent of cost of works

Contractor profit is added on total cost i.e. after adding overhead charges.

5 **Basic Inputs**

Basic inputs are only given in the standard data book. The rates for material and labour have to be updated by concerned State/UT govt. Officials like E-in-C, CE(NH), State PWDs.

6 **Plants and Equipment**

- 6.1 A dozer is proposed for excavation where cutting and filling for the roadway is within 100 m. For longer leads, a combination of hydraulic excavator and tipper is proposed.
- 6.2 Keeping in view, the managerial factors and the age factor of machines as per their utilization in various project sizes, the output of plant & equipment has been considered, however the output of plants is considered approximately 70 Percent of the rated capacity given by manufacture under ideal conditions.
- 6.3 The water tanker speed @ 10 km/hr. , return speed @ 15 km/hr. , spreading speed @ 2.5 km/hr. in soil & 3.00 km/hr. in granular material is considered for analysis. Water charges have not been included for items where the requirement is very nominal. It is assumed that the same would be covered under sundries.
- 6.4 Output of plant/equipment is considered for the compacted quantities.
- 6.5 The usage charges for machines include ownership charge which includes depreciation, interest charge, Insurance, road tax, cost of repair and maintenance including replacement of Tyres and running and operating charges which includes crew, fuel and lubricants.

7 **Materials**

- 7.1 Quantities of materials considered in the rate analysis are approximate for the purpose of estimation and include normal wastage. Actual consumption would have to be based on mix design.
- 7.2 The rates of material should include basic cost (including royalty) at locations of quarry/stone crushers, loading, unloading, cost of carriage and stacking at plant/sites as the case may be.
- 7.3 The alternative proposal for crushing own aggregate by installing crusher should be compared with procurement of crushed aggregates from the market and proposal found economical may be adopted.
- 7.4 The specifications of materials shall be governed by section 1000 of MoRT&H Specifications for Road and Bridge Works.
- 7.5 Material rates are excluding GST.

8 **Labour**

- 8.1 The labour wages should be as per rates fixed by state government.
- 8.2 One mate has been provided for 25 labours.

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BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

8.3 Highly Skilled labour include mason (1st class), carpenter, Blacksmith (1st class)/ Welder/ Plumber/ Electrician, (1st class), mechanics and other trades.

9 Carriage of Materials

9.1 The unit for carriage has been taken as under:

- a) In hours where lead is defined including time required for loading and unloading
- b) In tonne km where lead is variable. The loading and unloading for such cases have been provided separately.

9.2 Where the quantity of material to be transported is small such as dismantled material, which requires being loaded manually, provision of tractor-trolley has been made instead of tipper.

10 General :

10.1 The clause numbers refer to MoRT&H Specifications for Road and Bridge Works.

10.2 Assumptions made have been indicated in respective chapters in the form of notes, where required.

10.3 Sundries to cater for unforeseen contingency and miscellaneous items have been added in the overhead charges.

10.4 Arrangement for traffic during construction shall be as per Clause 112 of MoRT&H Specifications for Road and Bridge Works.

10.5 The supply of materials will be taken either at the location of mixing plant or at the work site as the case may be.

10.6 Contractor will make his own arrangements for borrowing earth. However, compensation for earth taken from private land has been included in the rate analysis for construction of embankment with borrowed earth

10.7 The requirement of machinery has been worked out assuming effective working period of 6 hours per shift of 8 hours.

10.8 Credit for Dismantled "-Material

The dismantled materials should be examined and a realistic assessment made for the credit for such materials, which can be utilized for works or auctioned.

10.9 In rate analysis of some items, the quantities of sub-items involved in that analyses like excavation for foundation, foundation concrete, painting, lettering etc. have been given. The rates for such items may be taken from relevant chapters where the same have already been analyzed.

10.10 The source of material and samples are required to be approved by the Engineer before start of any work.

10.11 The rates of items include cost of testing of soil, materials and works.

10.12 The use of surface by construction vehicles shall be governed by Clause 119 of MoRT&H Specifications.

10.13 The contractor shall arrange to provide and maintain an adequate equipped field laboratory as per Clause 120.

10.14 Quality Control of works shall be governed by Section 900 of MoRT&H Specifications.

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BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

- 10.15 The various activities of works shall also be documented by photographs and video cassettes/CDs as per Clauses 121 of MoRT&H Specifications.
- 10.16 The classification of excavated material shall be as per Clause 301.2 of MoRT&H Specifications.
- 10.17 The earth excavated from foundations has been considered to be backfilled and balance utilized locally for road work except in the case of marshy soil.
- 10.18 The rate analysis for removal of unsuitable soil does not provide for replacement by suitable soil which will have to be paid separately.
- 10.19 Items for hilly terrain have been analysed separately.
- 10.20 The hire charges for machinery and equipment are applicable for the year 2019-2020. It should be updated for subsequent years depending upon the market situation.
- 10.21 10 percent extra cement may be provided for concreting underwater, where required.
- 10.22 Grade of cement may be adopted as per mix design
- 10.23 Quantities of cement in various grades of cement concrete have been taken as per IRC: 112 & Clause 1703.3 of MoRT&H Specifications.
- 10.24 The rates for rigid, semi-rigid and flexible crash barriers have been analysed in Chapter-8.
- 10.25 The coarse and fine aggregates shall conform to IS: 383.
- 10.26 Wherever electric generator has not been considered to run a plant or equipment, it is assumed that it is fitted with a diesel engine
- 10.27 Some of the firms in the field of construction chemicals have evolved new brands of chemicals for water proofing, sealing of cracks, curing compound, admixture, cementing compounds etc.. The market can be explored to meet such requirements.
- 10.28 Some of major steel producing firms have evolved thermo-mechanically treated steel which has enhanced strength, better corrosion resistance, ductility, weld ability and high temperature thermal resistance. Enquiries from these firms can be made on technical specifications and use of such products considered in works based on performance in works where these have already been used.
- 10.29 Provision of fly ash has been made in embankment, sub-base, cement concrete pavement and in structural concrete.
- 10.30 The Standard Data Book is for Departmental use only. It cannot be produced in Court of Law as reference/authority and thus is a privilege document.

CHAPTER – 1

CARRIAGE OF MATERIALS

PREAMBLES:

- 1 Analysis for loading has been done both for manual and mechanical means for adoption as per actual situations.
- 2 The provision of tipper has been made in hours where lead is known like disposal of the materials upto 1 Km In case where lead is variable like carriage of hot mix or concrete mix from plants or earth from borrows areas, provision has been made in terms of tone-kilometer (tonne-km), which can be adopted as per actual conditions.
- 3 The cost of carriage will vary depending upon riding surface of the road. Provision has accordingly been made considering surface road, unsurfaced gravelled road and kutcha track.
 - i) The speed of loaded vehicle on black top surface road is taken as 25 kmph and empty vehicle is considered as 35 kmph in plain area and in hilly area the speed of loaded vehicle on black top surface road is considered as 20 kmph and empty vehicle speed is taken as 25 kmph.
 - ii) The speed of loaded vehicle on gravelled surface road is considered as 10 kmph and empty vehicle speed is considered as 15 kmph in plain area
 - iii) The speed of loaded vehicle on kutcha road is considered as 10 kmph and empty vehicle speed is considered as 15 kmph and in hilly.
 - iv) The speed of loaded Transit Mixture is considered as 10 kmph and empty Transit Mixture speed is considered as 15 kmph.
- 4 Provision has been made for a tractor trolley instead of tipper where dismantled materials or material having more volume as compared with weight are required to be transported. This arrangement is more economical.
- 5 Where loading is done by mechanical plant like HMP or batching plant and there is automatic loading in tippers, provision of loading and un-loading time has been taken by the tipper for getting loaded at the plant and un-loading in the paver or otherwise at site.
- 6 Aggregate shall be crushed at contractor's own crushing plant.

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
1.01	A	Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum. Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip Unit = cum Taking output = 5.5 cum Time required for			
		i) Positioning of tipper at loading point	Min	1.50	
		ii) Loading by front end loader 1 cum bucket capacity	Min	7.90	
		iii) Maneuvering, reversing, dumping and turning for return	Min	3.00	
		iv) Waiting time, unforeseen contingencies etc.	Min	5.00	
		Total	Min	17.40	
	a)	Machinery			
		Tipper 5.5 cum capacity	hour	0.29	
		Front end-loader 1 cum bucket capacity	hour	0.29	
	b)	Overheads @ on (a)			
	c)	Contractors profit @ on (a+b)			
		Cost for 5.5 cum = a+b+c			
		Rate per cum = (a+b+c)/5.5			
	Note	Unloading will be by tipping.			
1.01	B	Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum. Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip Unit = cum Taking output = 10 cum Time required for			
		i) Positioning of tipper at loading point	Min	1.50	
		ii) Loading by front end loader 1 cum bucket capacity	Min	14.37	
		iii) Maneuvering, reversing, dumping and turning for return	Min	3.00	
		iv) Waiting time, unforeseen contingencies etc.	Min	5.00	
		Total	Min	23.87	
	a)	Machinery			
		Tipper 10 cum capacity	hour	0.40	
		Front end-loader 1 cum bucket capacity	hour	0.40	
	b)	Overheads @ on (a)			
	c)	Contractors profit @ on (a+b)			
		Cost for 10 cum = a+b+c			
		Rate per cum = (a+b+c)/10			
	Note	Unloading will be by tipping.			

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
1.01	C	Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum. Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip Unit = cum Taking output = 14.00 cum Time required for			
		i) Positioning of tipper at loading point	Min	1.50	
		ii) Loading by front end loader 2.1 cum bucket capacity	Min	9.56	
		iii) Maneuvering, reversing, dumping and turning for return	Min	3.00	
		iv) Waiting time, unforeseen contingencies etc.	Min	5.00	
		Total	Min	19.06	
	a)	Machinery			
		Tipper 14 cum capacity	hour	0.32	
		Front end-loader 2.1 cum bucket capacity	hour	0.32	
	b)	Overheads @ on (a)			
	c)	Contractors profit @ on (a+b)			
		Cost for 14 cum = a+b+c			
		Rate per cum = (a+b+c)/14			
	Note	Unloading will be by tipping.			
1.01	D	Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum. Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip Unit = cum Taking output = 18 cum Time required for			
		i) Positioning of tipper at loading point	Min	1.50	
		ii) Loading by front end loader 3.1 cum bucket capacity	Min	8.32	
		iii) Maneuvering, reversing, dumping and turning for return	Min	3.00	
		iv) Waiting time, unforeseen contingencies etc.	Min	5.00	
		Total	Min	17.82	
	a)	Machinery			
		Tipper 18 cum capacity	hour	0.30	
		Front end-loader 3.1 cum bucket capacity	hour	0.30	
	b)	Overheads @ on (a)			
	c)	Contractors profit @ on (a+b)			
		Cost for 18 cum = a+b+c			
		Rate per cum = (a+b+c)/18			
	Note	Unloading will be by tipping.			

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
1.02		Loading and Unloading of Boulders by Manual Means Unit = cum Taking output = 10 cum a) Labour Mate day 0.073 Mazdoor for loading and unloading day 1.814 b) Machinery Tipper 10 Cum capacity hour 1.814 c) Overheads @ on (a+b) d) Contractors profit @ on (a+b+c) Cost for 10 cum = a+b+c+d Rate per cum = (a+b+c+d)/10			
		Note Unloading will be by tipping.			
1.03		Loading and Unloading of Cement or Steel by Manual Means and Stacking. Unit = tonne Taking output = 18 tonne a) Labour Mate day 0.192 Mazdoor for loading and unloading day 4.788 b) Machinery Truck 18 tonne capacity hour 4.788 c) Overheads @ on (a+b) d) Contractors profit @ on (a+b+c) Cost for 18 tonnes = a+b+c+d Rate per tonnes = (a+b+c+d)/18			
1.04	(i)	Cost of Haulage Excluding Loading and Unloading A Case-I : Surfaced Road (Plain) Haulage of materials by tipper excluding cost of loading, unloading and stacking. Unit = t.km Taking output 10 tonnes load and lead 10 km = 100 t.km Speed with load : 25 km / hour. Speed while Returning empty: 35 km / hour. a) Machinery. i) Tipper 10 tonne capacity Time taken for onward haulage with load hour 0.400 Time taken for empty return trip. hour 0.286 b) Overheads @ on (a) c) Contractors profit @ on (a+b) cost for 100 t. km = a+b+c Rate per t.km = (a+b+c)/100			

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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B Case-I : Surfaced Road (Plain)

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 18 tonnes load and lead 10 km = 180 t.km

Speed with load : 25 km / hour.

Speed while Returning empty: 35 km / hour.

a) Machinery.

i) Tipper 18 tonne capacity

Time taken for onward haulage with load hour 0.400

Time taken for empty return trip. hour 0.286

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

cost for 180 t km = a+b+c

Rate per t.km = (a+b+c)/180

C Case-I : Surfaced Road (Plain)

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 25 tonnes load and lead 10 km = 250 t.km

Speed with load : 25 km / hour.

Speed while Returning empty: 35 km / hour.

a) Machinery.

i) Tipper 25 tonne capacity

Time taken for onward haulage with load hour 0.400

Time taken for empty return trip. hour 0.286

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

cost for 250 t km = a+b+c

Rate per t.km = (a+b+c)/250

D Case-I : Surfaced Road (Plain)

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit : t.km

Taking output 32 tonnes load and lead 10 km = 320 t.km

Speed with load : 25 km / hour.

Speed while Returning empty: 35 km / hour.

a) Machinery.

i) Tipper 32 tonne capacity

Time taken for onward haulage with load hour 0.400

Time taken for empty return trip. hour 0.286

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

cost for 320 t km = a+b+c

Rate per t.km = (a+b+c)/320

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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E Case-I : Surfaced Road (Hilly)

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 10 tonnes load and lead 10 km = 100 t.km

Speed with load : 20 km / hour.

Speed while Returning empty: 25 km / hour.

a) Machinery.

i) Tipper 10 tonne capacity

Time taken for onward haulage with load hour 0.500

Time taken for empty return trip. hour 0.400

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

cost for 100 t km = a+b+c

Rate per t.km = (a+b+c)/100

F Case-I : Surfaced Road (Hilly)

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 18 tonnes load and lead 10 km = 180 t.km

Speed with load : 20 km / hour.

Speed while Returning empty: 25 km / hour.

a) Machinery.

i) Tipper 18 tonne capacity

Time taken for onward haulage with load hour 0.500

Time taken for empty return trip. hour 0.400

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

cost for 180 t km = a+b+c

Rate per t.km = (a+b+c)/180

G Case-I : Surfaced Road (Hilly)

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 25 tonnes load and lead 10 km = 250 t.km

Speed with load : 20 km / hour.

Speed while Returning empty: 25 km / hour.

a) Machinery.

i) Tipper 25 tonne capacity

Time taken for onward haulage with load hour 0.500

Time taken for empty return trip. hour 0.400

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

cost for 250 t km = a+b+c

Rate per t.km = (a+b+c)/250

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
	H	Case-I : Surfaced Road (Hilly) Haulage of materials by tipper excluding cost of loading, unloading and stacking. Unit = t.km Taking output 32 tonnes load and lead 10 km = 320 t.km Speed with load : 20 km / hour. Speed while Returning empty: 25 km / hour. a) Machinery. i) Tipper 32 tonne capacity Time taken for onward haulage with load hour 0.500 Time taken for empty return trip. hour 0.400 b) Overheads @ on (a) c) Contractors profit @ on (a+b) cost for 320 t km = a+b+c Rate per t.km = (a+b+c)/320			
1.04	(ii)	A Case-II : Unsurfaced Gravelled Road Haulage of materials by tipper excluding cost of loading, unloading and stacking. Unit = t.km Taking output 10 tonnes load and lead 10 km = 100 t.km Speed with load : 10 km / hour Speed for empty return trip : 15 km / hour a) Machinery i) Tipper 10 tonnes capacity Time taken for onward haulage with load hour 1.000 Time taken for empty return trip hour 0.667 b) Overheads @ on (a) c) Contractors profit @ on (a+b) Cost for 100 t .km = a+b+c Rate per t.Km = (a+b+c)/100			
	B	Case-II : Unsurfaced Gravelled Road Haulage of materials by tipper excluding cost of loading, unloading and stacking. Unit = t.km Taking output 18 tonnes load and lead 10 km = 180 t.km Speed with load : 10 km / hour Speed for empty return trip : 15 km / hour a) Machinery i) Tipper 18 tonnes capacity Time taken for onward haulagewith load hour 1.000 Time taken for empty return trip hour 0.667 b) Overheads @ on (a) c) Contractors profit @ on (a+b) Cost for 180 t .km = a+b+c Rate per t.Km = (a+b+c)/180			
	C	Case-II : Unsurfaced Gravelled Road Haulage of materials by tipper excluding cost of loading, unloading and stacking. Unit = t.km			

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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Taking output 25 tonnes load and lead 10 km = 250 t.km

Speed with load : 10 km / hour

Speed for empty return trip : 15 km / hour

a) Machinery

Tipper 25 tonnes capacity

Time taken for onward haulage with load hour 1.000

Time taken for empty return trip hour 0.667

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

Cost for 250 t .km = a+b+c

Rate per t.Km = (a+b+c)/250

D Case-II : Unsurfaced Gravelled Road

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 32 tonnes load and lead 10 km = 320 t.km

Speed with load : 10 km / hour

Speed for empty return trip : 15 km / hour

a) Machinery

Tipper 32 tonnes capacity

Time taken for onward haulage with load hour 1.000

Time taken for empty return trip hour 0.667

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

Cost for 320 t .km = a+b+c

Rate per t.Km = (a+b+c)/320

1.04

(iii)

A Case-III: Katcha Track and Track in river bed / nallah bed and choe bed.

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 10 tonnes load and lead 10 km = 100 t.km

Speed with load : 10 km / hour

Speed while returning empty : 15 km / hour

a) Machinery

l) Tipper 10 tonnes capacity

Time taken for onward haulage hour 1.000

Time taken for empty return trip hour 0.667

b) Overheads @ on (a)

c) Contractors profit @ on (a+b)

Cost for 100 t .km = a+b+c

Rate per t.Km = (a+b+c)/100

B Case-III: Katcha Track and Track in river bed / nallah bed and choe bed.

Haulage of materials by tipper excluding cost of loading, unloading and stacking.

Unit = t.km

Taking output 18 tonnes load and lead 10 km = 180 t.km

Speed with load : 10 km / hour

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Speed while returning empty : 15 km / hour			
		a) Machinery			
		1) Tipper 18 tonnes capacity			
		Time taken for onward haulage	hour	1.000	
		Time taken for empty return trip	hour	0.667	
		b) Overheads @ on (a)			
		c) Contractors profit @ on (a+b)			
		Cost for 180 t.km = a+b+c			
		Rate per t.Km = (a+b+c)/180			
	C	Case-III: Katcha Track and Track in river bed / nallah bed and choe bed.			
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.			
		Unit = t.km			
		Taking output 25 tonnes load and lead 10 km = 250 t.km			
		Speed with load : 10 km / hour			
		Speed while returning empty : 15 km / hour			
		a) Machinery			
		1) Tipper 18 tonnes capacity			
		Time taken for onward haulage	hour	1.000	
		Time taken for empty return trip	hour	0.667	
		b) Overheads @ on (a)			
		c) Contractors profit @ on (a+b)			
		Cost for 250 t.km = a+b+c			
		Rate per t.Km = (a+b+c)/250			
	D	Case-III: Katcha Track and Track in river bed / nallah bed and choe bed.			
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.			
		Unit = t.km			
		Taking output 32 tonnes load and lead 10 km = 320 t.km			
		Speed with load : 10 km / hour			
		Speed while returning empty : 15 km / hour			
		a) Machinery			
		1) Tipper 32 tonnes capacity			
		Time taken for onward haulage	hour	1.000	
		Time taken for empty return trip	hour	0.667	
		b) Overheads @ on (a)			
		c) Contractors profit @ on (a+b)			
		Cost for 320 t.km = a+b+c			
		Rate per t.Km = (a+b+c)/320			
1.04	(iv)	Case-V : Transit Mixture			
		Haulage of concrete by Transit mixture excluding cost of loading, unloading and stacking.			
		Unit = t.km			
		Taking output 15 tonnes load and lead 10 km = 150 t.km			
		Speed with load : 10 km / hour			
		Speed while returning empty : 15 km / hour			
		a) Machinery			
		1) Transit Mixture 6 cum capacity			

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Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Time taken for onward haulage with load	hour	1.000	
		Time taken for empty return trip	hour	0.667	
		b) Overheads @ on (a)			
		c) Contractors profit @ on (a+b)			
		Cost for 150 t.km = a+b+c			
		Rate per t.Km = (a+b+c)/150			
1.05		Hand Broken Stone Aggregates 63 mm nominal size			
		Supply of quarried stone, hand breaking into coarse aggregate 63 mm nominal size (passing 80 mm and retained on 50 mm sieve) and stacking as directed			
		Unit = Cum			
		Taking output = 1.0 cum			
		a) Labour			
		Mate	day	0.080	
		Mazdoor	day	1.995	
		b) Material			
		Supply of quarried stone 150 - 200 mm size	cum	1.100	
		c) Overheads @ on (a+b)			
		d) Contractors profit @ on (a+b+c)			
		Rate per cum = a+b+c+d			
1.06		Crushing of stone aggregates (Nominal size)			
		Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 250 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of different nominal size.			
		Unit = Cum			
		Taking Output = 750 Cum			
		a) Labour			
		Mate	day	0.426	
		Mazdoor Skilled	day	2.660	
		Mazdoor	day	7.980	
		b) Material			
		Stone Boulder of size 150 mm and below	cum	750.000	
		c) Machinery			
		Integrated stone crusher of 250 TPH including belt conveyor and vibrating screens	Hour	6.429	
		Generator 725 KVA	Hour	6.429	
		Front end loader 3.1 cum bucket capacity at quarry and crusher	Hour	6.560	
		Tipper 14 cum capacity for loading at quarry site	Hour	6.560	
		Tipper 14 cum capacity for transportation within 1 km	t.km	1125.000	
		d) Cost for 750 cum = (a+b+c)			
		e) Crushing Pattern			
		40 mm (tonne)	22.71%	255.488	
		20 mm (tonne)	23.00%	258.750	

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		10 mm (tonne)	25.86%	290.925	
		Dust (tonne)	28.43%	319.838	
		f) % Cost distribution { (d) x (f) / (e) x 1.5 }			
		40 mm	Cum	28.98%	
		20 mm	Cum	31.95%	
		10 mm	Cum	30.75%	
		Dust	Cum	8.32%	
		g) Overheads @ on (f)			
		40 mm			
		20 mm			
		10 mm			
		Dust			
		h) Contractors profit @ on (f) and (g)			
		40 mm			
		20 mm			
		10 mm			
		Dust			
		i) Rate per cum = (f+g+h)			
		40 mm			
		20 mm			
		10 mm			
		Dust			

Note: The average density of 1.5 tonne/cum is only a reference density in this Data Book.

1.07

Crushing of stone aggregates (GSB Crusher Run)

Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 250 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain crusher run (all in aggregate) for GSB.

Unit = Cum

Taking Output = 750 Cum

a) Labour

Mate	day	0.426
Mazdoor Skilled	day	2.660
Mazdoor	day	7.980

b) Material

Stone Boulder of size 150 mm and below	cum	750.000
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c) Machinery

Integrated stone crusher of 250 TPH including belt conveyor and vibrating screens (for producing crusher run production capacity will increase by 30%)	Hour	4.945
Generator 725 KVA	Hour	4.945
Front end loader 3.1 cum bucket capacity at quarry and crusher	Hour	6.560
Tipper 14 cum capacity for loading at quarry site	Hour	6.560

CHAPTER: 1- CARRIAGE OF MATERIALS

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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Tipper 14 cum capacity for transportation
within 1 km

t.km

1125.000

d) Overheads @ on (a+b+c)

e) Contractors profit @ on (a+b+c+d)

Cost for 900 cum = (a+b+c+d+e)

Rate per cum = (a+b+c+d+e)/900

Note: Considering Crushed volume will be 1.2 times the volume of boulder

CHAPTER – 2

SITE CLEARANCE

PREAMBLES:

- 1 Carriage of dismantled materials, bushes, branches of tree etc., has been catered with a tipper mechanical loading and unloading within a lead of 1000 meter.
- 2 Unless otherwise stated the rates include sorting and disposal of unserviceable material and stacking of serviceable material with all lifts and upto a lead of 1000 meter.
- 3 The Clearing and Grubbing road land has been considered both by manual and mechanical means (by use of Dozer & by use of Motor Grader).The rates include sorting and disposal of unserviceable material and stacking of serviceable material with all lifts and upto a lead of 1000 meter. The estimator can use his discretion depending upon quantum of work and particular site conditions for mechanical means (by using Dozer or by using Motor Grader).
- 4 The dismantling of structures has been considered both by manual and mechanical means .The rates include sorting and disposal of unserviceable material and stacking of serviceable material with all lifts and upto a lead of 1000 meter. The estimator can use his discretion depending upon quantum of work and particular site conditions for mechanical means.
- 5 The rates include T&P and scaffolding required for items of dismantling.
- 6 Where only grass/wild growth is met, item No. 2.02 i.e. clearing grass and removal of rubbish can be applied. As regards wild growth disposal of grass, the same can be disposed.
- 7 The dismantling of structures has been catered both by manual and mechanical means. The estimator can use his discretion depending upon quantum of work and particular site conditions.
- 8 Cutting of rivets has been provided separately.
- 9 Dismantling of Hume pipes has been catered mechanical means as pipes can be easily rolled by men to a suitable stacking place within the right of way.
- 10 For dismantling of structures, which remain submerged in water, the cost may be enhanced by 50 Percent.
- 11 Dismantling of utilities is required to be done under the supervision of concerned departments with prior information to the users.
- 12 In certain items of dismantling, like, pipe culverts, utilities, etc., excavation in earth and dismantling of masonry works is not included in this analysis for which suitable notes have been inserted. These items are required to be priced separately based on actual quantities at site and nature of work.
- 13 The dismantled materials should be examined and a realistic assessment and provision made after due process for the credit for such materials, which can be utilized for works or auction.
- 14 In case where lead for disposal is more than 1000 m, extra cost of carriage is required to be added based on tonne - kilometerage.
- 15 All minor T&P items required for dismantling are already included in overhead charges.
- 16 Provision has been made for a tractor trolley / 10 tonne capacity tipper for transport of utility removal like telephone/electrical poles & lines, water pipe lines, and dismantling materials of sorts or material having more volume as compared with weight are required to be transported. This arrangement is more economical.
- 17 For dismantling of utility services like water pipe lines, electric and telephone lines, prior intimation should be given to users.

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
2.01	201	A	Cutting of trees, excluding removal of stumps and roots of trees				
			Cutting of trees stacking of serviceable material with all lifts and up to a lead of 1000 metres.				
		(i)	Girth from 300 mm to 600 mm				
			Unit = Each				
			Taking output = 40 nos				
		a) Labour					
		Mate	day	1.277	1.277	1.277	
		Mazdoors	day	31.920	31.920	31.920	
		b) Machinery					
		Tipper					
		(i) 18 cum capacity	hour	1.600			
		(ii) 14 cum capacity	hour		2.000		
		(iii) 10 cum capacity	hour			2.667	
		Sundries @ 1% of labour cost (a)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/40					
		(ii)	Girth from 600 mm to 900 mm				
			Unit = Each				
			Taking output = 30 nos				
		a) Labour					
		Mate	day	1.436	1.436	1.436	
		Mazdoors	day	35.910	35.910	35.910	
		b) Machinery					
		Tipper					
		(i) 18 cum capacity	hour	1.500			
		(ii) 14 cum capacity	hour		2.000		
		(iii) 10 cum capacity	hour			3.750	
		Sundries @ 1% of labour cost (a)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/30					
		(iii)	Girth from 900 mm to 1800 mm				
			Unit = Each				
			Taking output = 25 nos				
		a) Labour					
		Mate	day	2.660	2.660	2.660	
		Mazdoors	day	66.500	66.500	66.500	
		b) Machinery					
		Tipper					
		(i) 18 cum capacity	hour	1.250			
		(ii) 14 cum capacity	hour		1.667		
		(iii) 10 cum capacity	hour			3.125	
		Sundries @ 1% of labour					

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		cost (a)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/25					
	(iv)	Girth above 1800 mm					
		Unit = Each					
		Taking output = 20 nos					
		a) Labour					
		Mate	day	4.256	4.256	4.256	
		Mazdoors	day	106.400	106.400	106.400	
		b) Machinery					
		Tipper					
		(i) 18 cum capacity	hour	1.667			
		(ii) 14 cum capacity	hour		2.500		
		(iii) 10 cum capacity	hour			5.000	
		Sundries @ 1% of labour cost (a)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/20					
	Note:	All the serviceable material resulting from tree cutting would be handed over to the employer for the all above items.					
2.01	201	B					
		Removal of stumps and roots including backfilling with suitable material to required compaction					
		Removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 metres and earth filling in the depression/pit.					
	(i)	Girth from 300 mm to 600 mm					
		Unit = Each					
		Taking output = 40 nos					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoors	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.000			
		(ii) 1.1 cum bucket capacity	hour		5.500		
		(iii) 0.9 cum bucket capacity	hour			6.500	
		Tipper					
		(i) 18 cum capacity	hour	0.727			
		(ii) 14 cum capacity	hour		1.000		
		(iii) 10 cum capacity	hour			1.333	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/40					

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(ii)	Girth from 600 mm to 900 mm Unit = Each Taking output = 30 nos					
	a)	Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoors	day	1.330	1.330	1.330	
	b)	Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.000			
		(ii) 1.1 cum bucket capacity	hour		5.500		
		(iii) 0.9 cum bucket capacity	hour			6.500	
		Tipper					
		(i) 18 cum capacity	hour	0.750			
		(ii) 14 cum capacity	hour		1.000		
		(iii) 10 cum capacity	hour			1.500	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/30					
	(iii)	Girth from 900 mm to 1800 mm Unit = Each Taking output = 25 nos					
	a)	Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoors	day	1.330	1.330	1.330	
	b)	Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.000			
		(ii) 1.1 cum bucket capacity	hour		5.500		
		(iii) 0.9 cum bucket capacity	hour			6.500	
		Tipper					
		(i) 18 cum capacity	hour	0.758			
		(ii) 14 cum capacity	hour		1.000		
		(iii) 10 cum capacity	hour			1.471	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree = (a+b+c+d)/25					
	(iv)	Girth above 1800 mm Unit = Each Taking output =20 nos					
	a)	Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoors	day	1.330	1.330	1.330	
	b)	Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.000			
		(ii) 1.1 cum bucket capacity	hour		5.500		
		(iii) 0.9 cum bucket capacity	hour			6.500	
		Tipper					
		(i) 18 cum capacity	hour	0.714			
		(ii) 14 cum capacity	hour		1.000		
		(iii) 10 cum capacity	hour			1.429	

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)
 d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)
 Rate for each tree = (a+b+c+d)/20

Note: All the serviceable material resulting from girth removal would be handed over to the employer for the all above items.

2.02 201 Clearing Grass and Removal of Rubbish

Clearing grass and removal of rubbish up to a distance of 50 metres outside the periphery of the area.

By Manual Means

Unit = Hectare

Taking output = 1 Hectare

a) Labour

Mate	day	2.660	2.660	2.660
Mazdoor	day	66.500	66.500	66.500

b) Overhead charges

@ on (a) @ on (a) @ on (a)

c) Contractor's profit

@ on (a+b) @ on (a+b) @ on (a+b)

Rate per Hectare = a+b+c

2.03 201 Clearing and Grubbing Road Land

Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.

Unit = Hectare

Taking output = 1 Hectare

(i) By Manual Means:-

A In area of light jungle

a) Labour

Mate	day	7.980	7.980	7.980
Mazdoor	day	199.500	199.500	199.500

b) Machinery

Tractor-trolley	hour	122.222	122.222	122.222
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c) Overhead charges @ on (a+b)

d) Contractor's profit @ on (a+b+c)

Rate per Hectare = a+b+c+d

B In area of thorny jungle

a) Labour

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	10.640	10.640	10.640	
		Mazdoor	day	266.000	266.000	266.000	
		b) Machinery					
		Tractor-trolley	hour	122.222	122.222	122.222	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per Hectare = a+b+c+d					
2.03	(ii)	By Mechanical Means using Dozer					
	A	In area of light jungle					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Dozer					
		(i) Dozer (240HP)	hour	7.519			
		(ii) Dozer (175 HP)	hour		9.709		
		(iii) Dozer (90 HP)	hour			17.544	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	1500.000			
		(ii) 14 cum capacity	t.km		1500.000		
		(iii) 10 cum capacity	t.km			1500.000	
		Loading & unloading charges for disposed of grabbed material					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	1000.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		1000.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			1000.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per Hectare = a+b+c+d					
2.03	B	In area of thorny jungle					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Dozer					
		(i) Dozer (240HP)	hour	9.398			
		(ii) Dozer (175 HP)	hour		12.136		
		(iii) Dozer (90 HP)	hour			21.930	
		Tipper					
		For transportation to dumping yard considering					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		lead @ 1km					
		(i) 18 cum capacity	t.km	1500.000			
		(ii) 14 cum capacity	t.km		1500.000		
		(iii) 10 cum capacity	t.km			1500.000	
		Loading & unloading charges for disposed of grabbed material					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	1000.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		1000.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			1000.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per Hectare = a+b+c+d					
2.03	(iii)	By Mechanical Means using Motor Grader					
	A	In area of light jungle					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	4.608			
		(ii) Motor grader 3.70 metre blade	hour		5.559		
		(iii) Motor grader 3.35 metre blade	hour			6.198	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	1500.000			
		(ii) 14 cum capacity	t.km		1500.000		
		(iii) 10 cum capacity	t.km			1500.000	
		Loading & unloading charges for disposed of grabbed material					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	1000.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		1000.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			1000.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per Hectare = a+b+c+d					
2.03	B	In area of thorny jungle					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	5.760			
		(ii) Motor grader 3.70 metre blade	hour		6.948		
		(iii) Motor grader 3.35 metre blade	hour			7.748	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	1500.000			
		(ii) 14 cum capacity	t.km		1500.000		
		(iii) 10 cum capacity	t.km			1500.000	
		Loading & unloading charges for disposed of grabbed material					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	1000.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		1000.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			1000.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per Hectare = a+b+c+d					
2.04	202	Dismantling of Structures					
		Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = Cum Taking output = 1.25 cum					
	(i)	Lime /Cement Concrete					
	I	By Manual Means					
	A	Lime Concrete, cement concrete grade M-10 and below					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor for dismantling and loading	day	1.330	1.330	1.330	
		b) Machinery					
		Tractor-trolley (considering 15 min loading time)	hour	0.299	0.299	0.299	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	B	Cement Concrete Grade M-15 & M-20					
		a) Labour					
		Mate	day	0.067	0.067	0.067	
		Mazdoor for dismantling and loading	day	1.663	1.663	1.663	
		b) Machinery					
		Tractor-trolley (considering 15 min loading time)	hour	0.299	0.299	0.299	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	C	Pre-stressed / Reinforced cement concrete grade M-20 & above					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Blacksmith	day	0.333	0.333	0.333	
		Mazdoor for dismantling, loading and unloading	day	4.655	4.655	4.655	
		b) Machinery					
		Tractor-trolley (considering 15 min loading time)	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	II	By Mechanical Means					
	A	Cement Concrete Grade M-15 & M-20					
		Unit = Cum					
		Taking output = 1.25 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor for loading and unloading & Pneumatic breaker	day	0.665	0.665	0.665	
		b) Machinery					
		Air Compressor 250 cfm	hour	0.625	0.625	0.625	
		Pneumatic breaker @ 1 cum per hour	hour	1.250	1.250	1.250	
		Tipper					
		For transportation to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t.km	1.875			
		(ii) 14 cum capacity	t.km		1.875		
		(iii) 10 cum capacity	t.km			1.875	
		Loading & unloading charges for disposed of material					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	1.250			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		1.250		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			1.250	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	B	Pre-stressed / reinforced cement concrete grade M-20 & above					
		Unit = Cum					
		Taking output = 1.25 cum					
		a) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor with Pneumatic breaker and for loading and unloading	day	1.210	1.210	1.210	
		Blacksmith	day	0.333	0.333	0.333	
		b) Machinery					
		Air Compressor 250 cfm	hour	0.625	0.625	0.625	
		Pneumatic breaker @ 1 cum per hour	hour	1.250	1.250	1.250	
		Tipper					
		For transportation to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t.km	1.875			
		(ii) 14 cum capacity	t.km		1.875		
		(iii) 10 cum capacity	t.km			1.875	
		Loading & unloading charges for disposed of material					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	1.250			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		1.250		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			1.250	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	(ii)	Dismantling Brick / Tile work					
		By Manual Means					
	A	In lime mortar					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor for dismantling, loading and unloading	day	0.665	0.665	0.665	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	B	In cement mortar					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor for dismantling, loading and unloading	day	0.998	0.998	0.998	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	C	In mud mortar					
		a) Labour					
		Mate	day	0.021	0.021	0.021	
		Mazdoor for dismantling and loading	day	0.532	0.532	0.532	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
2.04	D	Dry brick pitching or brick soling					
		a) Labour					
		Mate	day	0.019	0.019	0.019	
		Mazdoor for Dismantling, loading and unloading	day	0.466	0.466	0.466	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	(iii)	Dismantling Stone Masonry					
	I	By Manual Means					
	A	Rubble stone masonry in lime mortar					
		a) Labour					
		Mate	day	0.032	0.032	0.032	
		Mazdoor for dismantling, loading and unloading.	day	0.798	0.798	0.798	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	B	Rubble stone masonry in cement mortar.					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor for dismantling, loading and unloading.	day	0.998	0.998	0.998	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	C	Rubble Stone Masonry in mud mortar.					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor for dismantling, loading and unloading.	day	0.665	0.665	0.665	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
2.04	D	Dry rubble masonry					
		a) Labour					
		Mate	day	0.024	0.024	0.024	
		Mazdoor for dismantling, loading and unloading.	day	0.599	0.599	0.599	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	E	Dismantling stone pitching/ dry stone spalls.					
		a) Labour					
		Mate	day	0.021	0.021	0.021	
		Mazdoor for dismantling, loading and unloading.	day	0.532	0.532	0.532	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor for dismantling, loading and unloading	day	0.665	0.665	0.665	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	II A	By Mechanical Means Dismantling Brick / Tile work/ rubble masonry/ pitching/ etc by mechanical means Unit = cum Taking output = 20 cum					
		a) Labour					
		Mate	day	0.011	0.011	0.011	
		Mazdoor	day	0.266	0.266	0.266	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.623			
		(ii) 1.1 cum bucket capacity	hour		0.718		
		(iii) 0.9 cum bucket capacity	hour			1.003	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	30.000			
		(ii) 14 cum capacity	t.km		30.000		
		(iii) 10 cum capacity	t.km			30.000	
		Loading & unloading time					
		(i) 18 cum capacity	hour	0.623			
		(ii) 14 cum capacity	hour		0.718		
		(iii) 10 cum capacity	hour			1.003	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
2.04	(iv)	Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level Unit = Cum Taking output = 1.25 Cum					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Carpenter	day	0.665	0.665	0.665	
		Mazdoor for dismantling, loading and unloading.	day	1.330	1.330	1.330	
		b) Machinery					
		Tractor-trolley	hour	0.257	0.257	0.257	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
2.04	(v)	Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet. Unit = tonne Taking output = 1 tonne Including dismembering					
	A	a) Labour					
		Mate	day	0.186	0.186	0.186	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor for dismantling, loading and unloading	day	3.325	3.325	3.325	
		Add 2.5 Percent of cost of labour for gas cutting, ropes, pulleys etc.					
		b) Machinery					
		Tractor-trolley	hour	0.123	0.123	0.123	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per tonne = a+b+c+d					
2.04	B	Excluding dismembering.					
		a) Labour					
		Mate	day	0.133	0.133	0.133	
		Mazdoor for dismantling, loading and unloading	day	2.660	2.660	2.660	
		Blacksmith	day	0.665	0.665	0.665	
		Add 2.5 Percent of cost of labour for gas cutting, ropes, pulleys etc.					
		b) Machinery					
		Tractor-trolley	hour	0.123	0.123	0.123	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per tonne = a+b+c+d					
2.04	C	Extra over item No (v) A and (v) B for cutting rivets. Unit = each Taking output = 10 rivets					
		a) Labour					
		Mate	day	0.014	0.014	0.014	
		Blacksmith	day	0.173	0.173	0.173	
		Mazdoor	day	0.173	0.173	0.173	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 rivets = a+b+c					
		Rate for each rivet = (a+b+c)/10					
2.04	(vi)	Scraping of Bricks Dismantled from Brick Work including Stacking. Unit = numbers Taking output = 1000 numbers					
	A	In lime/Cement mortar					
		a) Labour					
		Mate	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per 1000 Nos = a+b+c					
2.04	B	In mud mortar					
		a) Labour					
		Mate	day	0.067	0.067	0.067	
		Mazdoor	day	1.663	1.663	1.663	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per 1000 Nos = a+b+c					

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
2.04	(vii)	Scraping of Stone from Dismantled Stone Masonry Unit = Cum Taking output = 1cum					
	A	In cement and lime mortar					
	a)	Labour					
		Mate	day	0.074	0.074	0.074	
		Mazdoor	day	1.862	1.862	1.862	
	b)	Overhead charges		@ on (a)	@ on (a)	@ on (a)	
	c)	Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per cum = a+b+c					
2.04	B	In Mud mortar					
	a)	Labour					
		Mate	day	0.016	0.016	0.016	
		Mazdoor	day	0.399	0.399	0.399	
	b)	Overhead charges		@ on (a)	@ on (a)	@ on (a)	
	c)	Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per cum = a+b+c					
2.04	(viii)	Scarping Plaster in Lime or Cement Mortar from Brick/ Stone Masonry Unit = sqm Taking output = 100 sqm					
	a)	Labour					
		Mate	day	0.213	0.213	0.213	
		Mazdoor for scarping and loading	day	5.320	5.320	5.320	
	b)	Machinery					
		Tractor-trolley	hour	0.308	0.308	0.308	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/100					
2.04	(ix)	Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works.					
	A	Up to 600 mm dia					
		Unit = metre					
		Taking output = 15 metre					
	a)	Labour					
		Mate	day	0.112	0.126	0.140	
		Mazdoor	day	2.799	3.145	3.512	
	b)	Machinery					
		Hydraulic Excavator					
	(i)	1.2 cum bucket capacity	hour	2.209			
	(ii)	1.1 cum bucket capacity	hour		2.729		
	(iii)	0.9 cum bucket capacity	hour			3.281	

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper For loading & Unloading Time & For transportation of excess material to dumping yard considering lead @ 1km (i) 18 cum capacity hour 2.259 (ii) 14 cum capacity hour 2.779 (iii) 10 cum capacity hour 3.331 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Rate for 15 metre = a+b+c+d Rate per metre = (a+b+c+d)/15					
	B	Above 600 mm to 900 mm dia Unit = metre Taking output = 15 metre a) Labour Mate day 0.125 0.139 0.154 Mazdoor day 3.132 3.477 3.845 b) Machinery Hydraulic Excavator (i) 1.2 cum bucket capacity hour 2.709 (ii) 1.1 cum bucket capacity hour 3.229 (iii) 0.9 cum bucket capacity hour 3.781 Tipper for Loading & unloading For loading & Unloading Time & For transportation of excess material to dumping yard considering lead @ 1km (i) 18 cum capacity hour 2.759 (ii) 14 cum capacity hour 3.279 (iii) 10 cum capacity hour 3.831 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Rate for 15 metre = a+b+c+d Rate per metre = (a+b+c+d)/15					
	C	Above 900 mm Unit = metre Taking output =15 metre a) Labour Mate day 0.139 0.152 0.180 Mazdoor day 3.464 3.810 4.510 b) Machinery Hydraulic Excavator (i) 1.2 cum bucket capacity hour 3.209 (ii) 1.1 cum bucket capacity hour 3.729 (iii) 0.9 cum bucket capacity hour 4.781 Tipper for Loading & unloading					

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For loading & Unloading Time & For transportation of excess material to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	hour	3.259			
		(ii) 14 cum capacity	hour		3.779		
		(iii) 10 cum capacity	hour			4.831	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for 15 metre = a+b+c+d					
		Rate per metre = (a+b+c+d)/15					
	Note	1. The excavation of earth, dismantling of stone masonry work in head walls and protection works is not included which is to be measured and paid separately. 2. Credit for retrieved stone from masonry work may be taken as per actual availability.					
2.05	202	Dismantling of Flexible Pavements Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately Unit = Cum Taking output = 1 cum (i) By Manual Means A Bituminous courses a) Labour Mate day 0.080 0.080 0.080 Mazdoor for dismantling, loading and unloading day 1.995 1.995 1.995 b) Machinery Tractor-trolley hour 0.167 0.167 0.167 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Rate per cum = a+b+c+d					
2.05	B	Granular courses a) Labour Mate day 0.053 0.053 0.053 Mazdoor for dismantling, loading and unloading day 1.330 1.330 1.330 b) Machinery Tractor-trolley hour 0.167 0.167 0.167 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Rate per cum = a+b+c+d					

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
2.05		Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately					
	(ii)	By Mechanical Means					
	A	Bituminous courses					
		Unit = Cum					
		Taking output = 20 cum					
		a) Labour					
		Mate	day	0.031	0.035	0.044	
		Mazdoor for dismantling, loading and unloading	day	0.782	0.887	1.108	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity considering output 85 sqm/8.5 cum per hour	hour	2.353			
		(ii) 1.1 cum bucket capacity considering output 75 sqm/7.5 cum per hour	hour		2.667		
		(iii) 0.9 cum bucket capacity considering output 60 sqm/6 cum per hour	hour			3.333	
		Tipper for transportation					
		(i) 18 cum capacity	t.km	46.000			
		(ii) 14 cum capacity	t.km		46.000		
		(iii) 10 cum capacity	t.km			46.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for 20 metre = a+b+c+d					
		Rate per metre = (a+b+c+d)/20					
	B	Granular courses					
		Unit = Cum					
		Taking output = 250 cum					
		a) Labour					
		Mate	day	0.045	0.052	0.073	
		Mazdoor for dismantling, loading and unloading	day	1.137	1.310	1.831	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	3.420			
		(ii) 1.1 cum bucket capacity	hour		3.938		
		(iii) 0.9 cum bucket capacity	hour			5.506	
		Tipper for transportation					
		(i) 18 cum capacity	t.km	575.000			
		(ii) 14 cum capacity	t.km		575.000		
		(iii) 10 cum capacity	t.km			575.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit Rate for 250 metre = a+b+c+d Rate per metre = (a+b+c+d)/250		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
2.06	202	Dismantling of Cement Concrete Pavement Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately Unit = cum Taking output = 60 cum					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	7.818			
		(ii) 1.1 cum bucket capacity	hour		9.198		
		(iii) 0.9 cum bucket capacity	hour			10.424	
		Jack Hammer	hour	7.818	10.452	13.899	
		Air Compressor 250 cfm	hour	2.880	2.880	2.880	
		with 2 leads of pneumatic breaker @ 1 cum per hour					
		Pneumatic breaker	hour	5.760	5.760	5.760	
		Concrete Joint Cutting Machine	hour	8.000	8.000	8.000	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	180.000			
		(ii) 14 cum capacity	t.km		180.000		
		(iii) 10 cum capacity	t.km			180.000	
		For Loading & unloading charges for disposed of grabbed material					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	72.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		72.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			72.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit Cost for 60 cum = a+b+c+d Rate per cum = (a+b+c+d)/ 60		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
2.07	202	Dismantling of Guard Rails Dismantling guard rails by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable materials and unserviceable materials separately. Unit = running metre Taking output = 1 metre					
		a) Labour					
		Mate	day	0.008	0.008	0.008	
		Mazdoor including loading and unloading	day	0.200	0.200	0.200	
		b) Machinery					
		Tractor-trolley	hour	0.006	0.006	0.006	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = a+b+c+d					
2.08	202	Dismantling of Kerb Stone Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre Unit = running metre Taking output = 10 metre					
		a) Labour					
		Mate	day	0.008	0.008	0.008	
		Mazdoor including loading and unloading	day	0.200	0.200	0.200	
		b) Machinery					
		Tractor-trolley	hour	0.139	0.139	0.139	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 m = a+b+c+d Rate per metre = (a+b+c+d)/10					
2.09	202	Dismantling of Kerb Stone Channel Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre Unit = running metre Taking output = 10 metre					
		a) Labour					
		Mate	day	0.012	0.012	0.012	
		Mazdoor including loading	day	0.299	0.299	0.299	

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		and unloading					
		b) Machinery					
		Tractor-trolley	hour	0.170	0.170	0.170	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 m = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
2.10	202	Dismantling of Kilometre Stone					
		Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and back filling of pit.					
		Unit = Each					
		Taking output = one KM stone					
A		5th KM stone					
		Quantity of cement concrete = 0.392 cum					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	0.998	0.998	0.998	
		b) Machinery					
		Tractor-trolley	hour	0.150	0.150	0.150	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for one 5th KM stone = a+b+c+d					
B		Ordinary KM Stone					
		Quantity of cement concrete = 0.269 cum					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor	day	0.665	0.665	0.665	
		b) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for one ordinary KM stone = a+b+c+d					
C		Hectometre Stone					
		Quantity of cement concrete = 0.048 cum					
		a) Labour					
		Mate	day	0.005	0.005	0.005	
		Mazdoor	day	0.133	0.133	0.133	
		b) Machinery					
		Tractor-trolley	hour	0.020	0.020	0.020	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for one Hectometre stone = a+b+c+d					

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

2.11 202

Dismantling of Fencing

Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable material and unserviceable material separately.

Unit = running metre

Taking output = 30 metres

a) Labour

Mate	day	0.160	0.160	0.160
Mazdoor including loading and unloading	day	3.990	3.990	3.990
Blacksmith	day	0.998	0.998	0.998

b) Machinery

Tractor-trolley	hour	0.150	0.150	0.150
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c) Overhead charges

@ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 30 metres = a+b+c+d

Rate per metre = (a+b+c+d)/30

2.12 202

Dismantling of CI Water Pipe Line

Dismantling of CI water pipe line 600 mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable material and unserviceable material separately under supervision of concerned department

Unit = running metre

Taking output = 10 metres

a) Labour

Mate	day	0.106	0.106	0.106
Mazdoor	day	2.660	2.660	2.660
Plumber	day	0.333	0.333	0.333

b) Machinery

Truck 10 tonne capacity	hour	0.250	0.250	0.250
Light Crane 3 tonne capacity	hour	0.500	0.500	0.500

c) Overhead charges

@ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 10 metres = a+b+c+d

Rate per metre = (a+b+c+d)/10

Note

The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.

CHAPTER: 2- SITE CLEARANCE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
2.13	202	Removal of Cement Concrete Pipe of Sewer Gutter Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works. Unit = running metre Taking output = 10 metres					
		a) Labour Mate day 0.133 0.133 0.133 Mazdoor day 3.325 3.325 3.325					
		b) Machinery Crane 5 tonne capacity hour 0.300 0.300 0.300 Truck flat body 10 tonne hour 1.000 1.000 1.000					
		c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)					
		d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)					
		Cost for 10 metres = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
	Note	The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					
2.14	202	Removal of Telephone / Electric Poles and Lines Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 metres and stacking the serviceable and unserviceable material separately Unit = each Taking output = 30 Nos					
		a) Labour Mate day 0.638 0.638 0.638 Mazdoor day 13.300 13.300 13.300 Electrician/Lineman day 2.660 2.660 2.660					
		b) Machinery Tractor-trolley hour 1.500 1.500 1.500					
		c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)					
		d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)					
		Cost for 30 poles = a+b+c+d					
		Rate per pole = (a+b+c+d)/30					
	Note:	All the serviceable material resulting from removal of Telephone / Electric Poles and Lines would be handed over to the employer.					

CHAPTER – 3

EARTHWORK, EROSION CONTROL AND DRAINAGE

PREAMBLES:

- 1 The rates have been analyzed using mechanical means. Manual means for certain items have also been provided which can be used for areas inaccessible to machines and for small jobs.
- 2 In the rate analyses of earthwork, only compacted volume of earth has been considered.
- 3 Rates have been analyzed for average working conditions.
- 4 Average achievable outputs of machines have been considered taking into account job and management factors.
- 5 A water tanker of 6, 12, & 16 KL capacity which is commonly used at construction sites has been considered.
- 6 The rate caters for disposal of unsuitable soil only upto a distance of 1 Km The cost of transportation beyond the initial lead of 1 km will be paid separately based on tonne-kilometer.
- 7 The replacement of unsuitable soil by suitable soil shall be included separately in the estimate. The rate analyses for removal of unsuitable soil does not provide for replacement by suitable soil.
- 8 In cases where embankment is constructed with earth taken from roadway, the cost of depositing the earth at the site of embankment is already included in the disposal of excavated earth.
- 9 For narrow and restricted areas, plate compactor has been proposed for compaction to achieve the desired density.
- 10 For small jobs where loading and unloading is required to be done manually, tractor – trolley has been proposed for carriage instead of a tipper.
- 11 In case excavated rock is found suitable for incorporation in works, suitable credit for the available rock shall be given.
- 12 The possibility of using the blasted rock fragments for backfilling behind structures or backfilling of foundation pits or filling in medians / separators or use in service road shall be examined before proposing disposal of excavated rock.
- 13 In case of hill roads, the cut earth can be pushed down the valley in case there is no objection. In that case, cost of disposal is not required to be provided.
- 14 'L2' (Lead for Earthwork borrow area to site) in the analysis represents lead in km one way. This will vary from project to project and is required to be ascertained at site at the time of estimation.
- 15 For inhabited areas, controlled blasting with limited charges of explosives has been provided. This involves smaller drill holes and additional requirement of electric detonators. Provision has accordingly been made
- 16 Any work involved for water courses at culverts (Clause 312) will be priced under respective items like excavation, grubbing, clearing etc. for which rate analyses have separately been made.
- 17 Earth excavated from drains can be used in roadway berms. Hence, carriage for disposal of same is not provided.
- 18 In rate analysis of some items, the quantities of sub-items involved in that analyses, like, excavation for foundation, foundation concrete, painting, lettering etc. has been given. The rates for such item shall be taken from relevant chapters where the same have already been analyzed.

CHAPTER – 3

EARTHWORK, EROSION CONTROL AND DRAINAGE

- 19 In case of rock fill embankment, it is assumed that material is available at site from rock cutting.
- 20 5 kilometer lead has been considered for rock fill embankment from roadway excavation.
- 21 The item of preparation and surface treatment of formation (Clause 310) is required to be added in the cost estimate only if there is substantial time lag between completion of sub-grade and lying of sub-base. As this item is incidental to works, it is not required to be included in BOQ.
- 22 Excavation for structures beyond the depth of 3 m has been included in Chapter-12.

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)														
				Large	Medium	Small															
3.01	301	<p>Excavation in Soil by Manual Means.</p> <p>Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto1000 metres.</p> <p>Unit = Cum</p> <p>Taking output = 120 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>2.394</td><td>2.394</td><td>2.394</td></tr><tr><td>Mazdoor</td><td>day</td><td>59.850</td><td>59.850</td><td>59.850</td></tr></table> <p>b) Machinery</p> <table><tr><td>Truck 5.5 cum capacity</td><td>hour</td><td>9.236</td><td>9.236</td><td>9.236</td></tr></table> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost of 120 cum = a+b+c+d</p> <p>Rate per cum = (a+b+c+d)/120</p>	Mate	day	2.394	2.394	2.394	Mazdoor	day	59.850	59.850	59.850	Truck 5.5 cum capacity	hour	9.236	9.236	9.236				
Mate	day	2.394	2.394	2.394																	
Mazdoor	day	59.850	59.850	59.850																	
Truck 5.5 cum capacity	hour	9.236	9.236	9.236																	
<p>Note In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.</p>																					
3.02	301	<p>Excavation in Ordinary Rock by Manual Means</p> <p>Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres</p> <p>Unit = Cum</p> <p>Taking output = 120 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>3.724</td><td>3.724</td><td>3.724</td></tr><tr><td>Mazdoor</td><td>day</td><td>93.100</td><td>93.100</td><td>93.100</td></tr></table> <p>b) Machinery</p> <table><tr><td>Truck 5.5 cum capacity</td><td>hour</td><td>9.236</td><td>9.236</td><td>9.236</td></tr></table> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 120 cum = a+b+c+d</p> <p>Rate per cum = (a+b+c+d)/120</p>	Mate	day	3.724	3.724	3.724	Mazdoor	day	93.100	93.100	93.100	Truck 5.5 cum capacity	hour	9.236	9.236	9.236				
Mate	day	3.724	3.724	3.724																	
Mazdoor	day	93.100	93.100	93.100																	
Truck 5.5 cum capacity	hour	9.236	9.236	9.236																	
<p>Note In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.</p>																					
3.03	301	<p>Excavation in Soil with Dozer with lead upto 1000 metres</p> <p>Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.</p>																			

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = Cum					
		Taking output = 500 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Dozer					
		Dozer (240HP)	hour	4.717			
		Dozer (175 HP)	hour		6.693		
		Dozer (90 HP)	hour			10.870	
		Tipper					
		(i) 14 cum capacity	t.km	800.000			
		(ii) 14 cum capacity	t.km		800.000		
		(iii) 10 cum capacity	t.km			800.000	
		Loading & unloading charges					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	500.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		500.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			500.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 500 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/500					
3.04	301	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres					
		Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Dozer					
		Dozer (240HP)	hour	5.882			
		Dozer (175 HP)	hour		8.333		
		Dozer (90 HP)	hour			13.636	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 14 cum capacity	t.km	720.000			
		(ii) 14 cum capacity	t.km		720.000		
		(iii) 10 cum capacity	t.km			720.000	

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For Loading & unloading charges					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	360.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		360.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			360.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/300					
3.05	301	Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres					
		Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres					
		Unit = cum					
		Taking output = 180 cum					
		a) Labour					
		Mate	day	0.279	0.279	0.279	
		Mazdoor	day	3.990	3.990	3.990	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		b) Machinery					
		Air Compressor 250 cfm	hour	27.500	27.500	27.500	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	55.000	55.000	55.000	
		Dozer					
		Dozer (240HP)	hour	4.235			
		Dozer (175 HP)	hour		6.000		
		Dozer (90 HP)	hour			9.818	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 14 cum capacity	t.km	360.000			
		(ii) 14 cum capacity	t.km		360.000		
		(iii) 10 cum capacity	t.km			360.000	
		For loading & unloading charges					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	216.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		216.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			216.000	
		c) Materials					
		Small dia Explosive at 0.40 kg / cum for 180 cum (180 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (180 x 0.2x5%)	kg	73.800	73.800	73.800	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos.	no	103.000	103.000	103.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes (required for 5% of the total quantity @ 0.6 m per hole for 1 cum)	no	10.000	10.000	10.000	
		Detonating fuse coil	m	320.000	320.000	320.000	
		Credit for excavated rock found suitable for use @ 50 Percent quantity blasted	cum	90.000	90.000	90.000	
		d) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		e) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

Cost for 180 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/180

- Note**
1. The quality and availability of rock shall be checked before affording credit.
 2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced/restricted to that extent.

3.06 301

Excavation in Soil using Hydraulic Excavator and Tippers with Disposal upto 1000 metres.

Excavation for roadwork in soil with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m

Unit = cum

Taking output = 350 cum

a) Labour

Mate	day	0.053	0.053	0.053
Mazdoor	day	1.330	1.330	1.330

b) Machinery

Hydraulic Excavator

(i) 1.2 cum bucket capacity	hour	4.674		
(ii) 1.1 cum bucket capacity	hour		5.981	
(iii) 0.9 cum bucket capacity	hour			7.525

Tipper

For transportation considering lead @ 1 km

(i) 14 cum capacity	t.km	525.000		
(ii) 14 cum capacity	t.km		525.000	
(iii) 10 cum capacity	t.km			525.000
For loading & unloading time				
(i) 14 cum capacity	hour	4.674		
(ii) 14 cum capacity	hour		5.981	
(iii) 10 cum capacity	hour			7.525

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 350 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/350					
3.07	301	Excavation in Ordinary Rock using Hydraulic Excavator and Tippers with Disposal upto 1000 metres. Excavation for roadwork in Ordinary Rock with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m Unit = cum Taking output = 60 cum a) Labour Mate day 0.053 0.053 0.053 Mazdoor day 1.330 1.330 1.330 b) Machinery Hydraulic Excavator for Jack Hammer (i) 1.2 cum bucket capacity hour 8.312 (ii) 1.1 cum bucket capacity hour 9.778 (iii) 0.9 cum bucket capacity hour 10.390 Jack Hammer hour 8.312 9.778 10.390 Tipper For transportation considering lead @ 1km (i) 14 cum capacity t.km 120.000 (ii) 14 cum capacity t.km 120.000 (iii) 10 cum capacity t.km 120.000 For loading & unloading charges for disposed of grabbed material (i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader cum 72.000 (ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader cum 72.000 (iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader cum 72.000 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 60 cum = a+b+c+d Rate per cum = (a+b+c+d)/60					

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																																																
				Large	Medium	Small																																																																	
3.08	301	<p>Excavation in Hard Rock (blasting prohibited)</p> <p>Excavation for roadwork in Hard Rock (blasting prohibited) with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m</p> <p>A Mechanical Method</p> <p>Unit = cum</p> <p>Taking output = 50 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.053</td><td>0.053</td><td>0.053</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table> <p>b) Machinery</p> <p>Hydraulic Excavator for Jack Hammer</p> <table><tr><td>(i) 1.2 cum bucket capacity</td><td>hour</td><td>10.159</td><td></td><td></td></tr><tr><td>(ii) 1.1 cum bucket capacity</td><td>hour</td><td></td><td>11.951</td><td></td></tr><tr><td>(iii) 0.9 cum bucket capacity</td><td>hour</td><td></td><td></td><td>13.545</td></tr></table> <p>Jack Hammer</p> <table><tr><td></td><td>hour</td><td>10.159</td><td>11.951</td><td>13.545</td></tr></table> <p>Tipper</p> <p>For transportation considering lead @ 1km</p> <table><tr><td>(i) 14 cum capacity</td><td>t.km</td><td>100.000</td><td></td><td></td></tr><tr><td>(ii) 14 cum capacity</td><td>t.km</td><td></td><td>100.000</td><td></td></tr><tr><td>(iii) 10 cum capacity</td><td>t.km</td><td></td><td></td><td>100.000</td></tr></table> <p>For loading & unloading charges for disposed of grabbed material</p> <table><tr><td>(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader</td><td>cum</td><td>60.000</td><td></td><td></td></tr><tr><td>(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader</td><td>cum</td><td></td><td>60.000</td><td></td></tr><tr><td>(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader</td><td>cum</td><td></td><td></td><td>60.000</td></tr></table> <p>Credit for excavated rock found suitable for use @ 50 Percent of excavated quantity</p> <table><tr><td></td><td>cum</td><td>25.000</td><td>25.000</td><td>25.000</td></tr></table> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 50 cum = a+b+c+d</p> <p>Rate per cum = (a+b+c+d)/50</p>	Mate	day	0.053	0.053	0.053	Mazdoor	day	1.330	1.330	1.330	(i) 1.2 cum bucket capacity	hour	10.159			(ii) 1.1 cum bucket capacity	hour		11.951		(iii) 0.9 cum bucket capacity	hour			13.545		hour	10.159	11.951	13.545	(i) 14 cum capacity	t.km	100.000			(ii) 14 cum capacity	t.km		100.000		(iii) 10 cum capacity	t.km			100.000	(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	60.000			(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		60.000		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			60.000		cum	25.000	25.000	25.000				
Mate	day	0.053	0.053	0.053																																																																			
Mazdoor	day	1.330	1.330	1.330																																																																			
(i) 1.2 cum bucket capacity	hour	10.159																																																																					
(ii) 1.1 cum bucket capacity	hour		11.951																																																																				
(iii) 0.9 cum bucket capacity	hour			13.545																																																																			
	hour	10.159	11.951	13.545																																																																			
(i) 14 cum capacity	t.km	100.000																																																																					
(ii) 14 cum capacity	t.km		100.000																																																																				
(iii) 10 cum capacity	t.km			100.000																																																																			
(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	60.000																																																																					
(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		60.000																																																																				
(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			60.000																																																																			
	cum	25.000	25.000	25.000																																																																			
3.08	B	<p>Manual Method</p> <p>Unit = cum</p> <p>Taking output = 16 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>2.181</td><td>2.181</td><td>2.181</td></tr><tr><td>Mazdoor including loading in truck</td><td>day</td><td>21.280</td><td>21.280</td><td>21.280</td></tr><tr><td>Chiseller</td><td>day</td><td>31.920</td><td>31.920</td><td>31.920</td></tr><tr><td>Blacksmith (IInd class)</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table>	Mate	day	2.181	2.181	2.181	Mazdoor including loading in truck	day	21.280	21.280	21.280	Chiseller	day	31.920	31.920	31.920	Blacksmith (IInd class)	day	1.330	1.330	1.330																																																	
Mate	day	2.181	2.181	2.181																																																																			
Mazdoor including loading in truck	day	21.280	21.280	21.280																																																																			
Chiseller	day	31.920	31.920	31.920																																																																			
Blacksmith (IInd class)	day	1.330	1.330	1.330																																																																			

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

b) Machinery

Tipper 5.5 cum capacity, 1 trip per hour hour 2.900 2.900 2.900

Credit for excavated rock found suitable for use @ 50 Percent of excavated cum 8.000 8.000 8.000

c) Overhead charges

@ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 16 cum = a+b+c+d

Rate per cum = (a+b+c+d)/16

Note

1. Credit is considered for 50 Percent of quantity of work.
2. Loading for disposal will be done manually, being small quantity.
3. In case some rock is issued to contractor at site, the item of carriage shall be omitted to the extent of quantity issued to the contractor.

3.09 301

Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres

Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres

Unit = cum

Taking output = 180 cum

a) Labour

Mate day 0.279 0.279 0.279

Mazdoor day 3.990 3.990 3.990

Driller day 2.660 2.660 2.660

Blaster day 0.333 0.333 0.333

b) Machinery

Air Compressor 250 cfm hour 27.500 27.500 27.500

Pneumatic breaker for drilling holes (@ 4.5 m per hour) hour 55.000 55.000 55.000

Dozer

Dozer (240HP) hour 4.235

Dozer (175 HP) hour 5.400

Dozer (90 HP) hour 9.818

Tipper

For transportation considering lead @ 1km

(i) 14 cum capacity t.km 360.000

(ii) 14 cum capacity t.km 360.000

(iii) 10 cum capacity t.km 360.000

For loading & unloading charges

(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader cum 216.000

(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader cum 216.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			216.000	
		c) Materials					
		Small dia Explosive at 0.40 kg / cum for 180 cum (180 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (180 x 0.2x5%)	kg	73.800	73.800	73.800	
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos	no	103.000	103.000	103.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes(required for 5% of the total quantity @ 0.6 m per hole for 1 cum)	no	10.000	10.000	10.000	
		Detonating fuse coil	m	320.000	320.000	320.000	
		Credit for excavated rock found suitable for use @ 50 Percent quantity blasted	cum	90.000	90.000	90.000	
		Add 5 Percent of cost of a+b+c towards muffling arrangements to guard against any rock fly off during blasting					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 180 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/180					
		Note					
		1. The quality and availability of rock shall be checked before affording credit.					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced/ restricted to that extent.					
3.10	301	Excavation in Marshy Soil using Hydraulic Excavator and Tippers with Disposal upto 1000 metres.					
		Excavation for roadwork in Marshy Soil with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m					
		Unit = cum					
		Taking output = 325 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	10.126			
		(ii) 1.1 cum bucket capacity	hour		11.662		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 0.9 cum bucket capacity	hour				16.304
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	487.500			
		(ii) 14 cum capacity	t.km		487.500		
		(iii) 10 cum capacity	t.km			487.500	
		For loading & unloading time					
		(i) 14 cum capacity	hour	10.126			
		(ii) 14 cum capacity	hour		11.662		
		(iii) 10 cum capacity	hour			16.304	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 325 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/325					
3.11	301	Removal of Unserviceable Soil with Disposal upto 1000 metres					
		Removal of unserviceable soil including excavation, loading and disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.					
		Unit = cum					
		Taking output = 415 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.677			
		(ii) 1.1 cum bucket capacity	hour		6.538		
		(iii) 0.9 cum bucket capacity	hour			9.140	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	622.500			
		(ii) 14 cum capacity	t.km		622.500		
		(iii) 10 cum capacity	t.km			622.500	
		For loading & unloading time					
		(i) 14 cum capacity	hour	5.677			
		(ii) 14 cum capacity	hour		6.538		
		(iii) 10 cum capacity	hour			9.140	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 415 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/415					

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																																																																									
				Large	Medium	Small																																																																																										
3.12	303	<p>Presplitting of Rock Excavation Slopes</p> <p>Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303</p> <p>Unit = Sqm.</p> <p>Taking output = 400 Sqm.</p> <p><i>(120 cum considering 300 mm average depth of excavation over the existing rock face)</i></p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.279</td><td>0.279</td><td>0.279</td></tr><tr><td>Mazdoor</td><td>day</td><td>3.990</td><td>3.990</td><td>3.990</td></tr><tr><td>Driller</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr><tr><td>Blaster</td><td>day</td><td>0.333</td><td>0.333</td><td>0.333</td></tr></table> <p>b) Machinery</p> <table><tr><td>Air Compressor 250 cfm</td><td>hour</td><td>17.000</td><td>17.000</td><td>17.000</td></tr><tr><td>Pneumatic breaker for drilling holes (@ 4.5 m per hour)</td><td>hour</td><td>34.000</td><td>34.000</td><td>34.000</td></tr></table> <p>Dozer</p> <table><tr><td>(i) Dozer (240HP)</td><td>hour</td><td>2.353</td><td></td><td></td></tr><tr><td>(ii) Dozer (175 HP)</td><td>hour</td><td></td><td>3.000</td><td></td></tr><tr><td>(iii) Dozer (90 HP)</td><td>hour</td><td></td><td></td><td>5.455</td></tr></table> <p>Tipper</p> <p>For transportation considering lead @ 1km</p> <table><tr><td>(i) 14 cum capacity</td><td>t.km</td><td>240.000</td><td></td><td></td></tr><tr><td>(ii) 14 cum capacity</td><td>t.km</td><td></td><td>240.000</td><td></td></tr><tr><td>(iii) 10 cum capacity</td><td>t.km</td><td></td><td></td><td>240.000</td></tr></table> <p>For Loading & unloading charges</p> <table><tr><td>(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader</td><td>cum</td><td>144.000</td><td></td><td></td></tr><tr><td>(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader</td><td>cum</td><td></td><td>144.000</td><td></td></tr><tr><td>(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader</td><td>cum</td><td></td><td></td><td>144.000</td></tr></table> <p>c) Materials</p> <table><tr><td>Small dia Explosive at 0.40 kg / cum for 400 cum (400 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (400 x 0.2x5%)</td><td>kg</td><td>49.200</td><td>49.200</td><td>49.200</td></tr><tr><td>Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos.</td><td>no</td><td>69.000</td><td>69.000</td><td>69.000</td></tr><tr><td>Ordinary detonators @ 1 per hole for 10 secondary holes(required for 5% of the total quantity @ 0.6 m per</td><td>no</td><td>7.000</td><td>7.000</td><td>7.000</td></tr></table>	Mate	day	0.279	0.279	0.279	Mazdoor	day	3.990	3.990	3.990	Driller	day	2.660	2.660	2.660	Blaster	day	0.333	0.333	0.333	Air Compressor 250 cfm	hour	17.000	17.000	17.000	Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	34.000	34.000	34.000	(i) Dozer (240HP)	hour	2.353			(ii) Dozer (175 HP)	hour		3.000		(iii) Dozer (90 HP)	hour			5.455	(i) 14 cum capacity	t.km	240.000			(ii) 14 cum capacity	t.km		240.000		(iii) 10 cum capacity	t.km			240.000	(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	144.000			(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		144.000		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			144.000	Small dia Explosive at 0.40 kg / cum for 400 cum (400 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (400 x 0.2x5%)	kg	49.200	49.200	49.200	Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos.	no	69.000	69.000	69.000	Ordinary detonators @ 1 per hole for 10 secondary holes(required for 5% of the total quantity @ 0.6 m per	no	7.000	7.000	7.000				
Mate	day	0.279	0.279	0.279																																																																																												
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(iii) 10 cum capacity	t.km			240.000																																																																																												
(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	144.000																																																																																														
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Small dia Explosive at 0.40 kg / cum for 400 cum (400 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (400 x 0.2x5%)	kg	49.200	49.200	49.200																																																																																												
Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos.	no	69.000	69.000	69.000																																																																																												
Ordinary detonators @ 1 per hole for 10 secondary holes(required for 5% of the total quantity @ 0.6 m per	no	7.000	7.000	7.000																																																																																												

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		hole for I cum)					
		Detonating fuse coil	m	213.000	213.000	213.000	
		Credit for excavated rock found suitable for use @ 50 Percent quantity blasted	cum	60.000	60.000	60.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 400 Sqm = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					

- Note**
1. The quality and availability of rock shall be checked before affording credit.
 2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced/restricted to that extent.

3.13 304

Excavation for Structures

Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.

(i) Ordinary soil

Unit = cum

Taking output = 10 cum

A Manual Means (Depth upto 3 m)

a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor	day	10.640	10.640	10.640

b) Overhead charges

c) Contractor's profit

@ on (a)	@ on (a)	@ on (a)
@ on (a+b)	@ on (a+b)	@ on (a+b)

Cost for 10 cum = a+b+c

Rate per cum = (a+b+c)/10

- Note** Cost of dewatering may be added where required upto 10 Percent of labour cost Assessment for dewatering shall be made as per site conditions.

3.13

B Mechanical Means (Depth upto 3 m)

Unit = cum

Taking output = 330 cum

a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor	day	10.640	10.640	10.640

b) Machinery

Hydraulic Excavator

For excavation & Backfill

(i) 1.2 cum bucket capacity	hour	5.508		
(ii) 1.1 cum bucket capacity	hour		6.344	
(iii) 0.9 cum bucket capacity	hour			8.869

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper For transportation of excess material to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	198.000			
		(ii) 14 cum capacity	t.km		198.000		
		(iii) 10 cum capacity	t.km			198.000	
		For loading & Unloading Time					
		(i) 14 cum capacity	hour	2.203			
		(ii) 14 cum capacity	hour		2.537		
		(iii) 10 cum capacity	hour			3.547	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 330 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/330					
3.13	(ii)	Ordinary Rock (not requiring blasting)					
	A	Manual Means (Depth upto 3 m)					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	a)	Labour					
		Mate	day	0.532	0.532	0.532	
		Mazdoor	day	13.300	13.300	13.300	
	b)	Overhead charges		@ on (a)	@ on (a)	@ on (a)	
	c)	Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
	Note	Cost of dewatering upto 10 Percent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions.					
3.13	B	Mechanical Means					
		<i>Unit = cum</i>					
		<i>Taking output = 50 cum</i>					
	a)	Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
	b)	Machinery					
		Hydraulic Excavator					
		For excavation , backfilling & loading					
		(i) 1.2 cum bucket capacity	hour	8.484			
		(ii) 1.1 cum bucket capacity	hour		9.943		
		(iii) 0.9 cum bucket capacity	hour			11.166	
		Jack Hammer	hour	6.926	8.149	8.658	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	40.000			
		(ii) 14 cum capacity	t.km		40.000		
		(iii) 10 cum capacity	t.km			40.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For loading & unloading time					
		(i) 14 cum capacity	hour	0.623			
		(ii) 14 cum capacity	hour		0.718		
		(iii) 10 cum capacity	hour			1.003	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 50 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/50					
3.13	(iii)	Hard Rock (requiring blasting)					
	A	Mechanical Means					
		Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303					
		Unit = cum					
		Taking output = 120 cum					
		a) Labour					
		Mate	day	0.279	0.279	0.279	
		Mazdoor	day	3.990	3.990	3.990	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		b) Machinery					
		Air Compressor 250 cfm	hour	17.000	17.000	17.000	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	34.000	34.000	34.000	
		Hydraulic Excavator for Jack Hammer & backfilling , loading					
		(i) 1.2 cum bucket capacity	hour	4.210			
		(ii) 1.1 cum bucket capacity	hour		4.969		
		(iii) 0.9 cum bucket capacity	hour			6.441	
		Jack Hammer (consider 5% of the volume for dressing)	hour	1.219	1.524	1.625	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 14 cum capacity	t.km	96.000			
		(ii) 14 cum capacity	t.km		96.000		
		(iii) 10 cum capacity	t.km			96.000	
		For loading & unloading time					
		(i) 14 cum capacity	hour	1.196			
		(ii) 14 cum capacity	hour		1.378		
		(iii) 10 cum capacity	hour			1.926	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Materials					
		Small dia Explosive at 0.40 kg / cum for 120 cum (120 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (120 x 0.2x5%)	kg	49.200	49.200	49.200	
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos	no	69.000	69.000	69.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes (required for 5% of the total quantity @ 0.6 m per hole for 1 cum)	no	7.000	7.000	7.000	
		Detonating fuse coil	m	213.000	213.000	213.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/120					
3.13	(iv)	Hard Rock (blasting prohibited)					
		Unit = cum					
		Taking output = 35 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Hydraulic Excavator used for Jack hammer & loading					
		(i) 1.2 cum bucket capacity	hour	11.394			
		(ii) 1.1 cum bucket capacity	hour		13.386		
		(iii) 0.9 cum bucket capacity	hour			16.409	
		Jack Hammer	hour	10.667	12.549	15.238	
		For transportation to dumping yard					
		Considering lead @ 1km					
		(i) 14 cum capacity		28.000			
		(ii) 14 cum capacity			28.000		
		(iii) 10 cum capacity				28.000	
		For loading & unloading					
		(i) 14 cum capacity	hour	0.291			
		(ii) 14 cum capacity	hour		0.335		
		(iii) 10 cum capacity	hour			0.468	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 35 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/35					
3.13	(v)	Marshy soil					
		Unit = cum					
		Taking output = 10 cum					

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

A Manual means (upto 3 m depth)

a) Labour

Mate/Supervisor

day

0.532

0.532

0.532

Mazdoor

day

13.300

13.300

13.300

b) Machinery

Tractor-trolley

hour

2.670

2.670

2.670

c) Material

Selected earth for refilling

cum

5.000

5.000

5.000

d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 10 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/ 10

- Note**
1. Cost of dewatering @ 30 Percent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.
 2. Shoring & strutting 20 Percent of (a), where required may be added
 3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item (i) to (iv) for ordinary soil

3.13

B Mechanical Means

Unit = cum

Taking output = 260 cum

a) Labour

Mate

day

0.053

0.053

0.053

Mazdoor

day

1.330

1.330

1.330

b) Machinery

Hydraulic Excavator

(i) 1.2 cum bucket capacity

hour

12.210

(ii) 1.1 cum bucket capacity

hour

14.061

(iii) 0.9 cum bucket capacity

hour

19.658

Tipper

For transportation to dumping yard considering lead @ 1km

(i) 14 cum capacity

t.km

639.600

(ii) 14 cum capacity

t.km

639.600

(iii) 10 cum capacity

t.km

639.600

For loading & unloading

(i) 14 cum capacity

hour

12.210

(ii) 14 cum capacity

hour

14.061

(iii) 10 cum capacity

hour

19.658

c) Material

Selected earth for refilling

cum

156.000

156.000

156.000

d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 260 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/260

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.14	305.4.3	Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres.					
		(i) Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor including loading and unloading	day	6.650	6.650	6.650	
		b) Machinery					
		Tractor-trolley	hour	1.670	1.670	1.670	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/100					
		Note In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.					
3.14	305.4.3	(ii) By Mechanical Means using Hydraulic excavator					
		Unit = sqm					
		Taking output = 6000 sqm					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.130			
		(ii) 1.1 cum bucket capacity	hour		5.908		
		(iii) 0.9 cum bucket capacity	hour			8.259	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	600.000			
		(ii) 14 cum capacity	t.km		600.000		
		(iii) 10 cum capacity	t.km			600.000	
		For loading & unloading					
		(i) 14 cum capacity	hour	5.130			
		(ii) 14 cum capacity	hour		5.908		
		(iii) 10 cum capacity	hour			8.259	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 6000 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/6000					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.14	305.4.3	(iii) By Mechanical Means using Motor Grader Unit = sqm Taking output = 12500 sqm					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	3.501			
		(ii) Motor grader 3.70 metre blade	hour		4.202		
		(iii) Motor grader 3.35 metre blade	hour			4.252	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	1250.000			
		(ii) 14 cum capacity	t.km		1250.000		
		(iii) 10 cum capacity	t.km			1250.000	
		For Loading & unloading charges					
		(i) Using by 14 cum capacity Tipper &	cum	625.000			
		2.1 Cum capacity Loader					
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		625.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			625.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12500 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/12500					
Note In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.							
3.15	305.4.3	Scarifying the existing bituminous surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres.					
		(i) By Mechanical Means using Hydraulic excavator					
		Unit = sqm					
		Taking output = 6000 sqm					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	6.186			
		(ii) 1.1 cum bucket capacity	hour		7.124		
		(iii) 0.9 cum bucket capacity	hour			9.960	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 14 cum capacity	t.km	690.000			
		(ii) 14 cum capacity	t.km		690.000		
		(iii) 10 cum capacity	t.km			690.000	
		For loading & unloading					
		(i) 14 cum capacity	hour	6.186			
		(ii) 14 cum capacity	hour		7.124		
		(iii) 10 cum capacity	hour			9.960	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 6000 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/6000					
3.15	305.4.3	(ii) By Mechanical Means using Motor Grader					
		Unit = sqm					
		Taking output = 12500 sqm					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	3.501			
		(ii) Motor grader 3.70 metre blade	hour		4.202		
		(iii) Motor grader 3.35 metre blade	hour			4.252	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t.km	1437.500			
		(ii) 14 cum capacity	t.km		1437.500		
		(iii) 10 cum capacity	t.km			1437.500	
		For Loading & unloading charges					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	625.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		625.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			625.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12500 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/12500					
3.16	305	Construction of Embankment with Material obtained from Borrow pits					
		Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2.					

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = cum					
		Taking output = 450 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	6.009			
		(ii) 1.1 cum bucket capacity	hour		6.920		
		(iii) 0.9 cum bucket capacity	hour			9.675	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450x1.6 x L2			
		(ii) 14 cum capacity	t.km		450x1.6 x L2		
		(iii) 10 cum capacity	t.km			450x1.6 x L2	
		For Loading & unloading time					
		(i) 14 cum capacity	hour	6.009			
		(ii) 14 cum capacity	hour		6.920		
		(iii) 10 cum capacity	hour			9.675	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.488			
		(ii) Motor grader 3.70 metre blade	hour		3.002		
		(iii) Motor grader 3.35 metre blade	hour			3.347	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 10 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.5 x L1 + 0.864			
		(ii) 12 KL capacity	hour		0.667 x L1 + 1.152		
		(iii) 6 KL capacity	hour			1.333 x L1 + 2.304	
		Vibratory roller	hour	2.601	2.601	2.601	
		c) Material					
		Cost of water (considering 5% additional moisture required)	KL	36.000	36.000	36.000	
		Compensation for earth taken from private land	cum	450.000	450.000	450.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/450					

Note Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																																	
				Large	Medium	Small																																																		
3.17	305	<p>Construction of Embankment with Material Deposited from Roadway Cutting</p> <p>Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.</p> <p>Unit = cum</p> <p>Taking output = 450 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.053</td><td>0.053</td><td>0.053</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table> <p>b) Machinery</p> <p>Motor grader for grading</p> <table><tr><td>(i) Motor grader 4.30 metre blade</td><td>hour</td><td>2.488</td><td></td><td></td></tr><tr><td>(ii) Motor grader 3.70 metre blade</td><td>hour</td><td></td><td>3.002</td><td></td></tr><tr><td>(iii) Motor grader 3.35 metre blade</td><td>hour</td><td></td><td></td><td>3.347</td></tr></table> <p>Water tanker (speed @ Water tanker speed km/ hr and return speed @ 10 km/hr and spreading speed @ 2.5 Km/hr.)</p> <table><tr><td>(i) 16 KL capacity</td><td>hour</td><td>0.5 x L1 + 0.864</td><td></td><td></td></tr><tr><td>(ii) 12 KL capacity</td><td>hour</td><td></td><td>0.667 x L1 + 1.152</td><td></td></tr><tr><td>(iii) 6 KL capacity</td><td>hour</td><td></td><td></td><td>1.333 x L1 + 2.304</td></tr></table> <p>Vibratory roller</p> <table><tr><td></td><td>hour</td><td>2.601</td><td>2.601</td><td>2.601</td></tr></table> <p>c) Material</p> <table><tr><td>Cost of water (considering 5% additional moisture required)</td><td>KL</td><td>36.000</td><td>36.000</td><td>36.000</td></tr></table> <p>d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)</p> <p>Cost for 450 cum = a+b+c+d+e</p> <p>Rate per cum = (a+b+c+d+e)/450</p>	Mate	day	0.053	0.053	0.053	Mazdoor	day	1.330	1.330	1.330	(i) Motor grader 4.30 metre blade	hour	2.488			(ii) Motor grader 3.70 metre blade	hour		3.002		(iii) Motor grader 3.35 metre blade	hour			3.347	(i) 16 KL capacity	hour	0.5 x L1 + 0.864			(ii) 12 KL capacity	hour		0.667 x L1 + 1.152		(iii) 6 KL capacity	hour			1.333 x L1 + 2.304		hour	2.601	2.601	2.601	Cost of water (considering 5% additional moisture required)	KL	36.000	36.000	36.000				
Mate	day	0.053	0.053	0.053																																																				
Mazdoor	day	1.330	1.330	1.330																																																				
(i) Motor grader 4.30 metre blade	hour	2.488																																																						
(ii) Motor grader 3.70 metre blade	hour		3.002																																																					
(iii) Motor grader 3.35 metre blade	hour			3.347																																																				
(i) 16 KL capacity	hour	0.5 x L1 + 0.864																																																						
(ii) 12 KL capacity	hour		0.667 x L1 + 1.152																																																					
(iii) 6 KL capacity	hour			1.333 x L1 + 2.304																																																				
	hour	2.601	2.601	2.601																																																				
Cost of water (considering 5% additional moisture required)	KL	36.000	36.000	36.000																																																				
3.18	305	<p>Construction of Subgrade and Earthen Shoulders</p> <p>Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2</p> <p>Unit = cum</p> <p>Taking output = 450 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.106</td><td>0.106</td><td>0.106</td></tr><tr><td>Mazdoor</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr></table> <p>b) Machinery</p>	Mate	day	0.106	0.106	0.106	Mazdoor	day	2.660	2.660	2.660																																												
Mate	day	0.106	0.106	0.106																																																				
Mazdoor	day	2.660	2.660	2.660																																																				

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	6.009			
		(ii) 1.1 cum bucket capacity	hour		6.920		
		(iii) 0.9 cum bucket capacity	hour			9.675	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450x1.75 x L2			
		(ii) 14 cum capacity	t.km		450x1.75 x L2		
		(iii) 10 cum capacity	t.km			450x1.75 x L2	
		For Loading & unloading time					
		(i) 14 cum capacity	hour	6.009			
		(ii) 14 cum capacity	hour		6.920		
		(iii) 10 cum capacity	hour			9.675	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.488			
		(ii) Motor grader 3.70 metre blade	hour		3.002		
		(iii) Motor grader 3.35 metre blade	hour			3.347	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.547 x L1 + 0.945			
		(ii) 12 KL capacity	hour		0.729 x L1 + 1.26		
		(iii) 6 KL capacity	hour			1.458 x L1 + 2.52	
		Vibratory roller 12 tonne	hour	2.601	2.601	2.601	
	c)	Material					
		Cost of water (considering 5% additional moisture required)	KL	39.375	39.375	39.375	
		Compensation for earth taken from private land	cum	450.000	450.000	450.000	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/450					
3.19	305	Construction of Subgrade and Earthen Shoulders with Material Deposited from Roadway Cutting					
		Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.					
		Unit = cum					
		Taking output = 450 cum					
	a)	Labour					
		Mate	day	0.053	0.053	0.053	

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.488			
		(ii) Motor grader 3.70 metre blade	hour		3.002		
		(iii) Motor grader 3.35 metre blade	hour			3.347	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 10 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.547 x L1 + 0.945			
		(ii) 12 KL capacity	hour		0.729 x L1 + 1.26		
		(iii) 6 KL capacity	hour			1.458 x L1 + 2.52	
		Vibratory roller	hour	2.601	2.601	2.601	
		c) Material					
		Cost of water (considering 5% additional moisture required)	KL	39.375	39.375	39.375	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/450					
3.20	305.3.4	Compacting Original Ground					
	Case-I	Compacting original ground supporting sub-grade					
		Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.					
		Unit = cum					
		Taking output = 225 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor grader for ripping (in two layers) & grading					
		(i) Motor grader 4.30 metre blade	hour	2.505			
		(ii) Motor grader 3.70 metre blade	hour		3.013		
		(iii) Motor grader 3.35 metre blade	hour			3.204	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.273 x L1 + 0.236			
		(ii) 12 KL capacity	hour		0.365 x L1 +		

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
					0.315		
		(iii) 6 KL capacity	hour			0.729 x L1 + 0.63	
		Vibratory roller	hour	1.301	1.301	1.301	
	c) Material						
		Cost of water (considering 5% additional moisture required)	KL	19.688	19.688	19.688	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 225 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/225					
Case-II							
		Compacting original ground supporting embankment					
		Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2 for embankment construction.					
		Unit = cum					
		Taking output = 300 cum					
	a) Labour						
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
	b) Machinery						
		Motor grader for ripping & grading					
		(i) Motor grader 4.30 metre blade	hour	3.985			
		(ii) Motor grader 3.70 metre blade	hour		4.796		
		(iii) Motor grader 3.35 metre blade	hour			5.140	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.333 x L1 + 0.64			
		(ii) 12 KL capacity	hour		0.444 x L1 + 0.853		
		(iii) 6 KL capacity	hour			0.889 x L1 + 1.707	
		Vibratory roller	hour	1.734	1.734	1.734	
	c) Material						
		Cost of water (considering 5% additional moisture required)	KL	24.000	24.000	24.000	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/300					

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																																																					
				Large	Medium	Small																																																																						
3.21	305	<p>Stripping and Storing Top Soil</p> <p>Stripping, storing of top soil by road side at 15 m interval and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth.</p> <p>Unit = cum</p> <p>Taking output = 250 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.053</td><td>0.053</td><td>0.053</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table> <p>b) Machinery</p> <p>Motor grader</p> <table><tr><td>(i) Motor grader 4.30 metre blade</td><td>hour</td><td>1.920</td><td></td><td></td></tr><tr><td>(ii) Motor grader 3.70 metre blade</td><td>hour</td><td></td><td>2.316</td><td></td></tr><tr><td>(iii) Motor grader 3.35 metre blade</td><td>hour</td><td></td><td></td><td>2.583</td></tr></table> <p>Hydraulic Excavator for reapplication</p> <table><tr><td>(i) 1.2 cum bucket capacity</td><td>hour</td><td>3.338</td><td></td><td></td></tr><tr><td>(ii) 1.1 cum bucket capacity</td><td>hour</td><td></td><td>3.845</td><td></td></tr><tr><td>(iii) 0.9 cum bucket capacity</td><td>hour</td><td></td><td></td><td>5.375</td></tr></table> <p>Tipper</p> <p>For transportation considering lead @ 1 km (20% of the material needs to be transported)</p> <table><tr><td>(i) 14 cum capacity</td><td>t.km</td><td>75.000</td><td></td><td></td></tr><tr><td>(ii) 14 cum capacity</td><td>t.km</td><td></td><td>75.000</td><td></td></tr><tr><td>(iii) 10 cum capacity</td><td>t.km</td><td></td><td></td><td>75.000</td></tr></table> <p>For loading (20% of the material needs to be transported)</p> <table><tr><td>(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader</td><td>cum</td><td>50.000</td><td></td><td></td></tr><tr><td>(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader</td><td>cum</td><td></td><td>50.000</td><td></td></tr><tr><td>(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader</td><td>cum</td><td></td><td></td><td>50.000</td></tr></table> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 250 cum = a+b+c+d</p> <p>Rate per cum = (a+b+c+d)/250</p>	Mate	day	0.053	0.053	0.053	Mazdoor	day	1.330	1.330	1.330	(i) Motor grader 4.30 metre blade	hour	1.920			(ii) Motor grader 3.70 metre blade	hour		2.316		(iii) Motor grader 3.35 metre blade	hour			2.583	(i) 1.2 cum bucket capacity	hour	3.338			(ii) 1.1 cum bucket capacity	hour		3.845		(iii) 0.9 cum bucket capacity	hour			5.375	(i) 14 cum capacity	t.km	75.000			(ii) 14 cum capacity	t.km		75.000		(iii) 10 cum capacity	t.km			75.000	(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	50.000			(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		50.000		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			50.000				
Mate	day	0.053	0.053	0.053																																																																								
Mazdoor	day	1.330	1.330	1.330																																																																								
(i) Motor grader 4.30 metre blade	hour	1.920																																																																										
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(i) 14 cum capacity	t.km	75.000																																																																										
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(iii) 10 cum capacity	t.km			75.000																																																																								
(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	50.000																																																																										
(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		50.000																																																																									
(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			50.000																																																																								
3.22		<p>Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields.</p> <p>Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after</p> <p>taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer.</p> <p>Unit = cum</p>																																																																										

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 250 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor grader					
		(i) Motor grader 4.30 metre blade	hour	1.920			
		(ii) Motor grader 3.70 metre blade	hour		2.316		
		(iii) Motor grader 3.35 metre blade	hour			2.583	
		Hydraulic Excavator for reapplication					
		(i) 1.2 cum bucket capacity	hour	3.338			
		(ii) 1.1 cum bucket capacity	hour		3.845		
		(iii) 0.9 cum bucket capacity	hour			5.375	
		Tipper					
		For transportation					
		(i) 14 cum capacity	t.km	250x1.6 x L2			
		(ii) 14 cum capacity	t.km		250x1.6 x L2		
		(iii) 10 cum capacity	t.km			250x1.6 x L2	
		For loading & unloading					
		(i) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum	250.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		250.000		
		(iii) Using by 10 cum capacity Tipper & 1 Cum capacity Loader	cum			250.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 250 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/250					
3.23	307	A Turfing with Sods					
		Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of sods and watering.					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor for preparation of ground and fetching of sods	day	3.990	3.990	3.990	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Water tanker including watering for 3 months					
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	1.000 x L1 + 0.096			
		(ii) 12 KL capacity	hour		1.333 x L1 + 0.128		
		(iii) 6 KL capacity	hour			2.667 x L1 + 0.256	
		Tractor-trolley	hour	1.000	1.000	1.000	
		c) Material					
		Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	0.180	0.180	0.180	
		Cost of water	KL	12.000	12.000	12.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 100 sqm = a+b+c+d+e					
		Rate per 100 sqm = (a+b+c+d+e)/100					
3.24	308	Seeding and Mulching					
		Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including cost of watering for 3 months all as per clause 308.					
		Unit = sqm					
		Taking output = 240 sqm					
		a) Labour					
		Mate	day	0.532	0.532	0.532	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Water tanker including watering for 3 months					
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	7 x L1 + 1.613			
		(ii) 12 KL capacity	hour		9.333 x L1 + 2.150		
		(iii) 6 KL capacity	hour			18.667 x L1 + 4.301	
		Tractor-trolley	hour	2.400	2.400	2.400	
		c) Material					
		Seeds	kg	3.600	3.600	3.600	
		Sludge/Farm yard manure @ 0.18 cum per 100 sqm	cum	0.430	0.430	0.430	

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Bitumen Emulsion	litre	55.200	55.200	55.200	
		Jute netting, open weave, 2.5 cm square opening	sqm	264.000	264.000	264.000	
		Cost of water for 3 months	KL	84.000	84.000	84.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 240 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/240					
3.25	309	Surface Drains in Soil					
		Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead of 1000 metres					
		Unit = metre					
		Taking output = 10 metres					
	A	Mechanical means					
		a) Labour					
		Mate	day	0.013	0.013	0.013	
		Mazdoor for dressing of bed and side of drain	day	0.333	0.333	0.333	
		b) Machinery					
		Hydraulic Excavator 0.9 cum bucket capacity	hour	0.107	0.107	0.107	
		Tractor-trolley					
		Tractor-trolley for transportation & for loading & Unloading Time	hour	0.263	0.263	0.263	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metres = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
3.25	B	Manual Means					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Tractor-trolley					
		Tractor-trolley for transportation & for loading & Unloading Time	hour	0.822	0.822	0.822	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metres = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					

Note: Where lining of drain is provided, quantity shall be worked out based on approved design and drawing and priced on rate of cement concrete of approved grade or stone/brick masonry as the case may be.

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.26	309	Surface Drains in Ordinary Rock Construction of unlined surface drain of average cross sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and to the requirement of clause 301 to 309. Excavated material to be used in embankment at site within a lead of 1000 metres. Unit = metre Taking output = 10 metres					
		A Mechanical Means					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor for dressing of bed and side of drain	day	0.665	0.665	0.665	
		b) Machinery					
		Hydraulic Excavator 0.9 cum bucket capacity	hour	0.133	0.133	0.133	
		Tractor-trolley					
		Tractor-trolley for transportation & for loading & Unloading Time	hour	0.288	0.288	0.288	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metres = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
3.26		B Manual Means					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Tractor-trolley					
		Tractor-trolley for transportation & for loading & Unloading Time	hour	1.044	1.044	1.044	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metres = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
3.27	309	Surface Drains in Hard Rock Rate per metre may be worked out based on quantity of hard rock as per design. For rate of hard rock cutting, refer relevant item in this chapter					
3.28	309	Sub-Surface Drains with Perforated Pipe Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/ asbestos cement/ cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm					

CHAPTER: 3- EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450 x 550 mm. Excavated material to be utilised in roadway at site. Unit = metre Taking output = 10 metres					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor for excavation and back filling	day	2.660	2.660	2.660	
		b) Material					
		Perforated pipe of cement concrete, internal dia 100 mm	metre	10.000	10.000	10.000	
		Crushed stone as per table 300-3	cum	2.400	2.400	2.400	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metres = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/10					
		Note Type of pipe may be modified depending upon provision in design.					
3.29	309	Aggregate Sub-Surface Drains Construction of aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to table 300-4, excavated material to be utilised in roadway. Unit = metre Taking output = 10 metres					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor for excavation and back filling with aggregates	day	1.995	1.995	1.995	
		b) Material					
		Crushed stone as per table 300-3	cum	1.350	1.350	1.350	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metres = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
3.30	309	Underground Drain at Edge of Pavement Construction of an underground drain 1 m x 1 m (inside dimensions) lined with RCC-20 cm thick and covered with RCC slab 10 cm in thickness on urban roads. Unit = Running metre Taking output = one metre					
		a) Earthwork in soil (Rate taken from Item No. - 3.13 including OH & CP)	cum	1.500	1.500	1.500	
		b) RCC work M-20 (Rate taken from Item No. - 9.06 C	cum	0.495	0.495	0.495	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Case-II including OH & CP)							
c)		Reinforcement	tonne	0.020	0.020	0.020	
		(Rate taken from Item No. - 9.07 including OH & CP)					

Rate per metre = (a+b+c)

Note :- Rates for these items may be taken from chapters on earth work and culvert respectively.

3.31 310

Preparation and Surface Treatment of Formation.

Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with smooth wheeled roller, complete as per clause 310.

Unit = sqm

Taking output = 3500 sqm

a) Labour

Mate	day	0.372	0.372	0.372
Mazdoor	day	7.980	7.980	7.980
Mazdoor skilled	day	1.330	1.330	1.330

b) Machinery

Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)

(i) 16 KL capacity	hour	0.25 x L1 + 0.84		
(ii) 12 KL capacity	hour		0.333 x L1 + 1.12	
(iii) 6 KL capacity	hour			0.667 x L1 + 2.24
Vibratory roller	hour	3.035	3.035	3.035

c) Material

Cost of water	KL	18.000	18.000	18.000
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d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 3500 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/3500

3.32 313

Construction of Rock fill Embankment with all lifts and lead upto 5 Km

Construction of rock fill embankment from roadway excavation with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		granular material, rolled with vibratory road roller, all complete as per clause 313.					
		Unit = cum					
		Taking output = 500 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Dozer					
		Dozer (240HP)	hour	4.717			
		Dozer (175 HP)	hour		6.024		
		Dozer (90 HP)	hour			10.870	
		Tipper for transportation of rock considering lead @ 5 km					
		(i) 14 cum capacity	t.km	4000.000			
		(ii) 14 cum capacity	t.km		4000.000		
		(iii) 10 cum capacity	t.km			4000.000	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.222 x L1 + 0.427			
		(ii) 12 KL capacity	hour		0.296 x L1 + 0.569		
		(iii) 6 KL capacity	hour			0.593 x L1 + 1.138	
		Vibratory roller	hour	2.890	2.890	2.890	
		c) Material					
		Cost of water (considering 5% additional moisture required)	KL	16.000	16.000	16.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 500 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/500					

Note It is assumed that rock is available locally at site from roadway cutting. In case, portion of the rock requires breaking to acceptable size of 300 mm, breaking charges will have to be added.

3.33

Work in Urban Roads

The cost of earth work in urban roads inhabited area will be comparatively higher due to following reasons:

- There is mixed traffic on urban roads like slow moving hand and animal driven carts, rickshaws, cycles, two/three wheeler apart from the usual vehicular traffic resulting into traffic jams. This causes loss of working time which may be in the range of 10 -15 Percent
- There is considerable disruption of

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

traffic adversely affecting the efficiency of the working parties including machines due to congestion caused by pedestrian traffic, local road side vendors, parking of vehicles by the road side, encroachments by the shopkeepers and local shops who make use of the berms of the road in front of these shops and unauthorised conversion of road berms into mini local market. The output of manpower and machines is substantially reduced due to factors mentioned above.

- c) Cost of living in urban areas is comparatively more resulting into higher wages.
- d) At times, work is executed during night time due to heavy traffic during day time. This involves extra expenditure by way of making arrangement for lighting and special transport for working parties due to odd hour

In the light of above, the authorities engaged in preparing the cost estimates may exercise their judgment and cater for the additional cost to the extent of 2 to 3 Percent, keeping in view the severity of factors mentioned above. Supporting details for the extra cost based on the actual conditions in specific cases will have to give in justification.

3.34 Suggestive

Embankment Construction with Flyash/ Pond ash available from coal or lignite burning Thermal Plants as waste material.

Construction of embankment with Fly ash conforming to Table 1 of IRC: SP: 58 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layers at OMC, all as specified in IRC: SP: 58 and as per approved plans.

Considering Soil blanketing of 2 m either side for 4 lane section

Unit = cum

Taking output = 450 cum

a) Labour

Mate	day	0.160	0.160	0.160
Mazdoor	day	3.990	3.990	3.990

b) Machinery

Hydraulic Excavator

For borrow area soil

(i) 1.2 cum bucket capacity	hour	0.901
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		1.038		
		(iii) 0.9 cum bucket capacity	hour			1.451	
		Tipper					
		Transportation of borrow area soil					
		(i) 14 cum capacity	t.km	67.5x1.6 x L2			
		(ii) 14 cum capacity	t.km		67.5x1.6 x L2		
		(iii) 10 cum capacity	t.km			67.5x1.6 x L2	
		Transportation of flyash					
		To be supplied by the Thermal Power Plant including loading and unloading					
		Loading & unloading					
		(i) 14 cum capacity	hour	0.901			
		(ii) 14 cum capacity	hour		1.038		
		(iii) 10 cum capacity	hour			1.451	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.488			
		(ii) Motor grader 3.70 metre blade	hour		3.002		
		(iii) Motor grader 3.35 metre blade	hour			3.347	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.713 x L1 + 1.231			
		(ii) 12 KL capacity	hour		0.95 x L1 + 1.642		
		(iii) 6 KL capacity	hour			1.9 x L1 + 3.283	
		Vibratory roller 12 tonne	hour	2.601	2.601	2.601	
	c)	Material					
		Cost of water (considering 5% additional moisture required)	KL	51.300	51.300	51.300	
		Compensation for earth taken from private land	cum	67.500	67.500	67.500	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/450					

- Note**
- As fly ash is available free of cost as waste material from Thermal Plants, cost of material has not been added.
 - The earth cover on sides and intermediate layers of earth sandwiching the fly ash has been included in this analysis.

CHAPTER – 4

SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

PREAMBLES:

- 1 Quantities of materials provided are approximate and are meant for the purpose of estimating only. Actual quantities shall be as per mix design.
- 2 For construction of sub-base, three alternatives as under have been provided:
 - a. Plant mix method
 - b. Mix in Placed method
 - c. Crusher Run method
- 3 For Plant Mix method of Granular sub base, a wet mix plant of 250 , 200 & 100 TPH capacity is taken as the appropriate mixing plant.
- 4 The plant mix method is actually being practiced from quite some time to get better quality of mix. It is also found economical as it can achieve much more progress.
- 5 In the case of cement treated sub-base or base course, Plant mixing as well as site mixing with the help of cement spreader, stabilizer equipment is considered for rate analysis.
- 6 In the case of sub-base or base course using RAP, milling machine is considered for rate analysis.
- 7 In the case of medians, separators and footpaths, plate compactor has been catered for compaction due to restricted space.
- 8 It has been assumed in the case of crushed cement concrete sub-base/base that during the process of dismantling, 25% of aggregate will get segregated and only the remaining will have to be broken/crushed from dismantled concrete slab portions. Transportation of material has been catered from place of dismantling to work site. In case, site is the same, transportation can be deleted.
- 9 Separate rate for penetration coat over top layer of crushed cement concrete base has been provided, as this item is optional.
- 10 The rate analysis for crushing of aggregates has been included in Chapter-1.
- 11 The quantity considered in the output is the compacted quantity. The quantities of aggregates provided in the rate analysis under the head material are the un-compacted quantities.

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.01	401	Granular Sub-Base with Graded Material (Table:- 400-1)					
		A Plant Mix Method					
		Construction of granular sub-base by providing granular material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401					
		Unit = cum					
		Taking output = 400 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	4.800			
		(ii) 200 tonne per hour	hour		6.000		
		(iii) 100 tonne per hour	hour			12.000	
		Electric generator					
		(i) 125 KVA	hour	4.800			
		(ii) 100 KVA	hour		6.000		
		(iii) 62.5 KVA	hour			12.000	
		Front end loader					
		(i) 3.1 Cum Capacity	hour	11.376			
		(ii) 2.1 Cum Capacity	hour		16.827		
		(iii) 1 Cum Capacity	hour			35.117	
		Tipper					
		For transportation					
		(i) 14 cum capacity	t.km	840 x L1			
		(ii) 14 cum capacity	t.km		840 x L1		
		(iii) 10 cum capacity	t.km			840 x L1	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.800			
		(ii) 14 cum capacity	hour		6.000		
		(iii) 10 cum capacity	hour			12.000	
		Motor grader					
		(i) Motor grader 4.30 metre blade	hour	3.687			
		(ii) Motor grader 3.70 metre blade	hour		4.447		
		(iii) Motor grader 3.35 metre blade	hour			4.958	
		Vibratory roller	hour	3.077	3.077	3.077	
		c) Material					
		Granular sub-base Material as per table 400-1					
		For Grading-I Material					
		53 mm to 26.5 mm @27.5 Percent	cum	148.077	148.077	148.077	
		26.5 mm to 9.5 mm @ 22.5 Percent	cum	121.154	121.154	121.154	

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		9.5 mm to 4.75 mm @ 10%	cum	53.846	53.846	53.846	
		4.75 mm below @ 40 Percent	cum	215.385	215.385	215.385	
		Cost of water	KL	67.200	67.200	67.200	
		OR					
		For Grading-II Material					
		26.5 mm to 9.5 mm @ 35 Percent	cum	188.462	188.462	188.462	
		9.5 mm to 4.75 mm @ 12.5 %	cum	67.308	67.308	67.308	
		4.75 mm below @ 52.5 Percent	cum	282.692	282.692	282.692	
		Cost of water	KL	67.200	67.200	67.200	
		OR					
		For Grading-III Material					
		26.5 mm to 9.5 mm @ 68 Percent	cum	366.154	366.154	366.154	
		9.5 mm to 4.75 mm @ 12 %	cum	64.615	64.615	64.615	
		4.75 mm below @ 20 Percent	cum	107.692	107.692	107.692	
		Cost of water	KL	67.200	67.200	67.200	
		OR					
		For Grading-IV Material					
		26.5 mm to 9.5 mm @ 64 Percent	cum	344.615	344.615	344.615	
		9.5 mm to 4.75 mm @ 11 %	cum	59.231	59.231	59.231	
		4.75 mm below @ 25 Percent	cum	134.615	134.615	134.615	
		Cost of water	KL	67.200	67.200	67.200	
		OR					
		For Grading-V Material					
		53 mm to 26.5 mm @27.5 Percent	cum	148.077	148.077	148.077	
		26.5 mm to 9.5 mm @ 22.5 Percent	cum	121.154	121.154	121.154	
		9.5 mm to 4.75 mm @ 12.50 %	cum	67.308	67.308	67.308	
		4.75 mm below @ 37.5 percent	cum	201.923	201.923	201.923	
		Cost of water	KL	67.200	67.200	67.200	
		OR					
		For Grading-VI Material					
		53 mm to 26.5 mm @12.5 Percent	cum	67.308	67.308	67.308	
		26.5 mm to 9.5 mm @22.5 Percent	cum	121.154	121.154	121.154	
		9.5 mm to 4.75 mm @ 22.5 %	cum	121.154	121.154	121.154	
		4.75 mm below @ 42.5 percent	cum	228.846	228.846	228.846	
		Cost of water	KL	67.200	67.200	67.200	
4.01A	(i)	Rate per cum for grading-I Material					
	d)	Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
	e)	Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 400 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					
4.01A	(ii)	Rate per cum for grading-II Material					
	d)	Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
	e)	Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 400 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.01A	(iii)	Rate per cum for grading-III Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 400 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					
4.01A	(iv)	Rate per cum for grading-IV Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 400 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					
4.01A	(v)	Rate per cum for grading-V Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 400 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					
4.01A	(vi)	Rate per cum for grading-VI Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 400 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/400					

Note:- Any one of the grading for material may be adopted as per design.

4.01

B By Mix in Place Method

Construction of granular sub-base by providing granular material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with front end loader at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401

Unit = cum

Taking output = 250 cum

a) Labour

Mate	day	0.213	0.213	0.213
Mazdoor skilled	day	1.330	1.330	1.330
Mazdoor	day	3.990	3.990	3.990

b) Machinery

Front end loader for mixing at stock pile location

(i) 3.1 Cum Capacity	hour	5.319		
(ii) 2.1 Cum Capacity	hour		7.813	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 1 Cum Capacity Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)	hour			16.667	
		(i) 16 KL capacity	hour	0.583 x L1 + 0.778			
		(ii) 12 KL capacity	hour		0.778 x L1 + 1.037		
		(iii) 6 KL capacity	hour			1.556 x L1 + 2.074	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.304			
		(ii) Motor grader 3.70 metre blade	hour		2.779		
		(iii) Motor grader 3.35 metre blade	hour			3.099	
		Vibratory roller	hour	1.923	1.923	1.923	
		c) Material					
		Granular sub-base Material as per table 400-1					
		For Grading-I Material					
		53 mm to 26.5 mm @27.5 Percent	cum	92.548	92.548	92.548	
		26.5 mm to 9.5 mm @ 22.5 Percent	cum	75.721	75.721	75.721	
		9.5 mm to 4.75 mm @ 10%	cum	33.654	33.654	33.654	
		4.75 mm below @ 40 percent	cum	134.615	134.615	134.615	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-II Material					
		26.5 mm to 9.5 mm @ 35 Percent	cum	117.788	117.788	117.788	
		9.5 mm to 4.75 mm @ 12.5 %	cum	42.067	42.067	42.067	
		4.75 mm below @ 52.5 percent	cum	176.683	176.683	176.683	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-III Material					
		26.5 mm to 9.5 mm @ 68 Percent	cum	228.846	228.846	228.846	
		9.5 mm to 4.75 mm @ 12 %	cum	40.385	40.385	40.385	
		4.75 mm below @ 20 percent	cum	67.308	67.308	67.308	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-IV Material					
		26.5 mm to 9.5 mm @ 64 Percent	cum	215.385	215.385	215.385	
		9.5 mm to 4.75 mm @ 11 %	cum	37.019	37.019	37.019	
		4.75 mm below @ 25 percent	cum	84.135	84.135	84.135	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-V Material					
		53 mm to 26.5 mm @27.5 Percent	cum	92.548	92.548	92.548	
		26.5 mm to 9.5 mm @ 22.5 Percent	cum	75.721	75.721	75.721	
		9.5 mm to 4.75 mm @ 12.50 %	cum	42.067	42.067	42.067	
		4.75 mm below @ 37.5 percent	cum	126.202	126.202	126.202	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-VI Material					
		53 mm to 26.5 mm @12.5 Percent	cum	42.067	42.067	42.067	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		26.5 mm to 9.5 mm @22.5 Percent	cum	75.721	75.721	75.721	
		9.5 mm to 4.75 mm @ 22.5 %	cum	75.721	75.721	75.721	
		4.75 mm below @ 42.5 percent	cum	143.029	143.029	143.029	
		Cost of water	KL	42.000	42.000	42.000	
4.01 B	(i)	Rate per cum for grading-I Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01 B	(ii)	Rate per cum for grading-II Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01 B	(iii)	Rate per cum for grading-III Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01 B	(iv)	Rate per cum for grading-IV Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01 B	(v)	Rate per cum for grading-V Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01 B	(vi)	Rate per cum for grading-VI Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					

Note :- Any one of the grading for material may be adopted as per design

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.01 401 & 407	C	Using Crusher Run					
		Construction of granular sub-base using crusher run, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401					
		Unit = cum					
		Taking output = 250 cum					
	a)	Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	1.330	1.330	1.330	
	b)	Machinery					
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	1.838			
		(ii) 2.1 Cum Capacity	hour		2.732		
		(iii) 1 Cum Capacity	hour			5.747	
		Tipper					
		For transportation					
		(i) 14 cum capacity	t.km	525 x L1			
		(ii) 14 cum capacity	t.km		525 x L1		
		(iii) 10 cum capacity	t.km			525 x L1	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	1.838			
		(ii) 14 cum capacity	hour		2.732		
		(iii) 10 cum capacity	hour			5.747	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.583 x L1 + 0.778			
		(ii) 12 KL capacity	hour		0.778 x L1 + 1.037		
		(iii) 6 KL capacity	hour			1.556 x L1 + 2.074	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.304			
		(ii) Motor grader 3.70 metre blade	hour		2.779		
		(iii) Motor grader 3.35 metre blade	hour			3.099	
		Vibratory roller	hour	1.923	1.923	1.923	
	c)	Material					
		Granular sub-base Material as per table 400-1					
		For Grading-I Material					
		53 mm to 4.75 mm below	cum	336.538	336.538	336.538	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-II Material					
		26.5 mm to 4.75 mm below	cum	336.538	336.538	336.538	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-III Material					
		26.5 mm to 4.75 mm below	cum	336.538	336.538	336.538	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-IV Material					
		26.5 mm to 4.75 mm below	cum	336.538	336.538	336.538	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-V Material					
		53 mm to 4.75 mm below	cum	336.538	336.538	336.538	
		Cost of water	KL	42.000	42.000	42.000	
		OR					
		For Grading-VI Material					
		53 mm to 4.75 mm below	cum	336.538	336.538	336.538	
		Cost of water	KL	42.000	42.000	42.000	
4.01C	(i)	Rate per cum for grading-I Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01C	(ii)	Rate per cum for grading-II Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01C	(iii)	Rate per cum for grading-III Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01C	(iv)	Rate per cum for grading-IV Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.01C	(v)	Rate per cum for grading-V Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.01C	(vi)	Rate per cum for grading-VI Material					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
Note :- Any one of the grading for material may be adopted as per design							
4.02 A	402	Lime Stabilisation for Improving Sub-grade Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 2 Percent slaked lime having minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade Unit = cum Taking output = 300 cum A By Manual Means					
		a) Labour					
		Mate	day	0.479	0.479	0.479	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Tractor with ripper and rotavator					
		attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 2.217			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.956		
		(iii) 6 KL capacity	hour			3.694 x L1 + 5.911	
		c) Material					
		Lime at site	tonne	10.500	10.500	10.500	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					
4.02 B	402	(i) Lime Stabilisation for Improving Sub-grade					
		Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 Percent slaked lime using Binder spreader Machine , having minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		Unit = cum					
		Taking output = 300 cum					
		By Mechanical Means					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m ² per hour	hour	2.667	2.667	2.667	
		Binder Spreader	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 2.217			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.956		
		(iii) 6 KL capacity	hour			3.694 x L1 + 5.911	
		c) Material					
		Lime at site	tonne	10.500	10.500	10.500	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					
4.02 B	402	(ii) Lime Stabilisation for Improving Sub-grade					
		Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 Percent slaked lime mannually spreaded having minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		Unit = cum					
		Taking output = 300 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		By Mechanical Means					
		a) Labour					
		Mate	day	0.479	0.479	0.479	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 2.217			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.956		
		(iii) 6 KL capacity	hour			3.694 x L1 + 5.911	
		c) Material					
		Lime at site	tonne	10.500	10.500	10.500	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 300					

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.03	402	A Cement Stabilisation for Improving Sub-grade Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 2 Percent cement, grading motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade. Unit = cum Taking output = 300 cum					
		A By Manual Means					
		a) Labour					
		Mate	day	0.479	0.479	0.479	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Tractor with ripper and rotavator					
		attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 2.217			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.956		
		(iii) 6 KL capacity	hour			3.694 x L1 + 5.911	
		c) Material					
		Cement at site	tonne	10.500	10.500	10.500	

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					
4.03	402	B Cement Stabilisation for Improving Sub-grade					
		(i) Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 percent cement using Binder spreader Machine , grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		By Mechanical Means					
		Unit = cum					
		Taking output =300 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor for spraying lime	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading					
		Time					
		(i) 14 cum capacity		4.006			
		(ii) 14 cum capacity			4.614		
		(iii) 10 cum capacity				6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour		2.667	2.667	2.667	
		Binder Spreader		2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) Motor grader 3.35 metre blade	hour				3.719
		Vibratory roller	hour	1.734	1.734		1.734
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 2.217			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.956		
		(iii) 6 KL capacity	hour			3.694 x L1 + 5.911	
		c) Material					
		Cement at site	tonne	10.500	10.500	10.500	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					
4.03 B	402	(ii) Cement Stabilisation for Improving Sub-grade					
		Laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 Percent cement manually spreaded , grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		Unit = cum					
		Taking output =300 cum					
		a) Labour					
		Mate	day	0.479	0.479	0.479	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 2.217			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.956		
		(iii) 6 KL capacity	hour			3.694 x L1 + 5.911	
		c) Material					
		Cement at site	tonne	10.500	10.500	10.500	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					
4.04	402	Lime Stabilisation in Embankment					
		Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 2 Percent slaked lime having minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		A By Manual Means					
		Unit = cum					
		Taking output =300 cum					
		a) Labour					
		Mate	day	0.479	0.479	0.479	
		Skilled mazdoor for alignment and geometrics	day	1.330	1.330	1.330	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L2			
		(ii) 14 cum capacity	t.km		450 x L2		
		(iii) 10 cum capacity	t.km			450 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Tractor with ripper and rotavator					
		attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.188 x L1 + 1.9			
		(ii) 12 KL capacity	hour		1.583 x L1 + 2.533		
		(iii) 6 KL capacity	hour			3.167 x L1 + 5.067	
		c) Material					
		Lime at site	tonne	9.000	9.000	9.000	
		Cost of water including water for curing	KL	85.500	85.500	85.500	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/300					
4.04 B	402	(i) Lime Stabilisation in Embankment					
		Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 percent slaked lime using Binder spreader Machine , having minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		improved sub grade					
		Unit = cum					
		Taking output =300 cum					
		By Mechanical Means					
		a) Labour					
		Mate	day	0.093	0.093	0.093	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L2			
		(ii) 14 cum capacity	t.km		450 x L2		
		(iii) 10 cum capacity	t.km			450 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.667	2.667	2.667	
		Binder Spreader	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.188 x L1 + 1.9			
		(ii) 12 KL capacity	hour		1.583 x L1 + 2.533		
		(iii) 6 KL capacity	hour			3.167 x L1 + 5.067	
		c) Material					
		Lime at site	tonne	9.000	9.000	9.000	
		Cost of water including water for curing	KL	85.500	85.500	85.500	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.04 B	402	(ii) Lime Stabilisation in Embankment Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 percent slaked lime manually spreaded having minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade Unit = cum Taking output =300 cum By Mechanical Means					
		a) Labour					
		Mate	day	0.466	0.466	0.466	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L2			
		(ii) 14 cum capacity	t.km		450 x L2		
		(iii) 10 cum capacity	t.km			450 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.188 x L1 + 1.9			
		(ii) 12 KL capacity	hour		1.583 x L1 + 2.533		
		(iii) 6 KL capacity	hour			3.167 x L1 + 5.067	
		c) Material					
		Lime at site	tonne	9.000	9.000	9.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost of water including water for curing	KL	85.500	85.500	85.500	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/300					
4.04 B	403	(iii) Cement Stabilisation in Embankment					
		Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 Percent cement using Binder spreader Machine , grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		Unit = cum					
		Taking output = 300 cum					
		By Mechanical Means					
		a) Labour					
		Mate	day	0.093	0.093	0.093	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L2			
		(ii) 14 cum capacity	t.km		450 x L2		
		(iii) 10 cum capacity	t.km			450 x L2	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.667	2.667	2.667	
		Binder Spreader	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.188 x L1 + 1.9			
		(ii) 12 KL capacity	hour		1.583 x L1 + 2.533		
		(iii) 6 KL capacity	hour			3.167 x L1 + 5.067	
		c) Material					
		Cement at site	tonne	9.000	9.000	9.000	
		Cost of water including water for curing	KL	85.500	85.500	85.500	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/300					
4.04 B	403	(iv) Cement Stabilisation in Embankment					
		Providing, laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with Soil Stabilizer with 2 percent cement manually spreaded , grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade					
		Unit = cum					
		Taking output = 300 cum					
		By Mechanical Means					
		a) Labour					
		Mate	day	0.466	0.466	0.466	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.006			
		(ii) 1.1 cum bucket capacity	hour		4.614		
		(iii) 0.9 cum bucket capacity	hour			6.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L2			
		(ii) 14 cum capacity	t.km		450 x L2		
		(iii) 10 cum capacity	t.km			450 x L2	
		For loading & unloading Time					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 14 cum capacity	hour	4.006			
		(ii) 14 cum capacity	hour		4.614		
		(iii) 10 cum capacity	hour			6.450	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.188 x L1 + 1.9			
		(ii) 12 KL capacity	hour		1.583 x L1 + 2.533		
		(iii) 6 KL capacity	hour			3.167 x L1 + 5.067	
		c) Material					
		Cement at site	tonne	9.000	9.000	9.000	
		Cost of water including water for curing	KL	85.500	85.500	85.500	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum= a+b+c+d+e					
		Rate per cum =(a+b+c+d+e)/ 300					
4.05	402	Lime Treated Soil for Sub- Base					
		Providing, laying and spreading soil on a prepared sub grade, pulverising, mixing the spread soil in place with rotavator with 3 percent slaked lime with minimum content of 70 Percent of CaO, grading with motor grader and compacting with the road roller at OMC to achieve at least 98 Percent of the max dry density to form a layer of sub base.					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor skilled	day	2.660	2.660	2.660	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	9.347			

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		10.765		
		(iii) 0.9 cum bucket capacity	hour			15.050	
		Tipper					
		For Transportation of Soil					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading					
		(i) 14 cum capacity	hour	9.347			
		(ii) 14 cum capacity	hour		10.765		
		(iii) 10 cum capacity	hour			15.050	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Tractor with ripper and rotavator					
		attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.729 x L1 + 1.167			
		(ii) 12 KL capacity	hour		0.972 x L1 + 1.556		
		(iii) 6 KL capacity	hour			1.944 x L1 + 3.111	
		c) Material					
		Lime at site	tonne	15.750	15.750	15.750	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		Cost of water	KL	52.500	52.500	52.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 cum = a+b+c+d+e					
		Rate per cum= (a+b+c+d+e)/300					
4.06	403	Cement Treated Soil Sub Base/ Base					
		Providing, laying and spreading soil on a prepared sub grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.					
		Unit = cum					
		Taking output = 300 cum					

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For 4 Percent quantity of cement by weight of soil					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor skilled	day	2.660	2.660	2.660	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	9.347			
		(ii) 1.1 cum bucket capacity	hour		10.765		
		(iii) 0.9 cum bucket capacity	hour			15.050	
		Tipper					
		For Transportation of Soil					
		(i) 14 cum capacity	t.km	525 x L2			
		(ii) 14 cum capacity	t.km		525 x L2		
		(iii) 10 cum capacity	t.km			525 x L2	
		For loading & unloading					
		(i) 14 cum capacity	hour	9.347			
		(ii) 14 cum capacity	hour		10.765		
		(iii) 10 cum capacity	hour			15.050	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.765			
		(ii) Motor grader 3.70 metre blade	hour		3.335		
		(iii) Motor grader 3.35 metre blade	hour			3.719	
		Vibratory roller	hour	1.734	1.734	1.734	
		Tractor with ripper and rotavator					
		attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.729 x L1 + 1.167			
		(ii) 12 KL capacity	hour		0.972 x L1 + 1.556		
		(iii) 6 KL capacity	hour			1.944 x L1 + 3.111	
		c) Material					
		Cement at site (@ 4 Percent of 525 tonne)	tonne	21.000	21.000	21.000	
		Compensation for earth taken from private land	cum	300.000	300.000	300.000	
		Cost of water	KL	52.500	52.500	52.500	
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 300 cum = a+b+c+d+e					
		Rate per cum= (a+b+c+d+e)/300					

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																																																																																			
				Large	Medium	Small																																																																																																				
4.07	403	<p>Cement Treated Crushed Rock or combination as per clause 403 and Table 400.4 in Sub base/ Base</p> <p>Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.</p> <p>Unit = cum</p> <p>Taking output = 300 cum</p> <p>Quantity of cement assumed as 4 Percent of quantity of crushed rock by weight.</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.638</td><td>0.638</td><td>0.638</td></tr><tr><td>Mazdoor skilled</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr><tr><td>Mazdoor</td><td>day</td><td>13.300</td><td>13.300</td><td>13.300</td></tr></table> <p>b) Machinery</p> <p>Motor grader for grading</p> <table><tr><td>(i) Motor grader 4.30 metre blade</td><td>hour</td><td>2.765</td><td></td><td></td></tr><tr><td>(ii) Motor grader 3.70 metre blade</td><td>hour</td><td></td><td>3.335</td><td></td></tr><tr><td>(iii) Motor grader 3.35 metre blade</td><td>hour</td><td></td><td></td><td>3.719</td></tr></table> <p>Vibratory roller</p> <table><tr><td></td><td>hour</td><td>1.734</td><td>1.734</td><td>1.734</td></tr></table> <p>Tractor with ripper and rotavator attachments @ 250 cum per hour for mixing</p> <table><tr><td></td><td>hour</td><td>1.200</td><td>1.200</td><td>1.200</td></tr></table> <p>Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)</p> <table><tr><td>(i) 16 KL capacity</td><td>hour</td><td>0.833 x L1 + 1.333</td><td></td><td></td></tr><tr><td>(ii) 12 KL capacity</td><td>hour</td><td></td><td>1.111 x L1 + 1.778</td><td></td></tr><tr><td>(iii) 6 KL capacity</td><td>hour</td><td></td><td></td><td>2.222 x L1 + 3.556</td></tr></table> <p>c) Material</p> <table><tr><td>Cement at site @ 4 Percent by weight of crushed aggregate (600 tonne)</td><td>tonne</td><td>24.000</td><td>24.000</td><td>24.000</td></tr></table> <p>Grading of material for sub-base course</p> <table><tr><td>37.5 mm to 9.5 mm @ 55 Percent</td><td>cum</td><td>211.200</td><td>211.200</td><td>211.200</td></tr><tr><td>9.5 mm to 4.75 mm @ 20 Percent</td><td>cum</td><td>76.800</td><td>76.800</td><td>76.800</td></tr><tr><td>4.75 mm to 75 micron @ 25 Percent</td><td>cum</td><td>96.000</td><td>96.000</td><td>96.000</td></tr><tr><td>Cost of water</td><td>KL</td><td>60.000</td><td>60.000</td><td>60.000</td></tr></table> <p align="center">or</p> <p>Grading of material for Base course</p> <table><tr><td>37.5 mm to 9.5 mm @ 32.5 Percent</td><td>cum</td><td>124.800</td><td>124.800</td><td>124.800</td></tr><tr><td>9.5 mm to 4.75 mm @ 5 Percent</td><td>cum</td><td>19.200</td><td>19.200</td><td>19.200</td></tr><tr><td>4.75 mm to 75 micron @ 62.5 Percent</td><td>cum</td><td>240.000</td><td>240.000</td><td>240.000</td></tr><tr><td>Cost of water</td><td>KL</td><td>60.000</td><td>60.000</td><td>60.000</td></tr></table>	Mate	day	0.638	0.638	0.638	Mazdoor skilled	day	2.660	2.660	2.660	Mazdoor	day	13.300	13.300	13.300	(i) Motor grader 4.30 metre blade	hour	2.765			(ii) Motor grader 3.70 metre blade	hour		3.335		(iii) Motor grader 3.35 metre blade	hour			3.719		hour	1.734	1.734	1.734		hour	1.200	1.200	1.200	(i) 16 KL capacity	hour	0.833 x L1 + 1.333			(ii) 12 KL capacity	hour		1.111 x L1 + 1.778		(iii) 6 KL capacity	hour			2.222 x L1 + 3.556	Cement at site @ 4 Percent by weight of crushed aggregate (600 tonne)	tonne	24.000	24.000	24.000	37.5 mm to 9.5 mm @ 55 Percent	cum	211.200	211.200	211.200	9.5 mm to 4.75 mm @ 20 Percent	cum	76.800	76.800	76.800	4.75 mm to 75 micron @ 25 Percent	cum	96.000	96.000	96.000	Cost of water	KL	60.000	60.000	60.000	37.5 mm to 9.5 mm @ 32.5 Percent	cum	124.800	124.800	124.800	9.5 mm to 4.75 mm @ 5 Percent	cum	19.200	19.200	19.200	4.75 mm to 75 micron @ 62.5 Percent	cum	240.000	240.000	240.000	Cost of water	KL	60.000	60.000	60.000				
Mate	day	0.638	0.638	0.638																																																																																																						
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Cement at site @ 4 Percent by weight of crushed aggregate (600 tonne)	tonne	24.000	24.000	24.000																																																																																																						
37.5 mm to 9.5 mm @ 55 Percent	cum	211.200	211.200	211.200																																																																																																						
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CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.07		(i) For Sub-Base course d) Overhead charges @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) Cost for 300 cum = a+b+c+d+e Rate per cum = (a+b+c+d+e)/300					
4.07		(ii) For Base course d) Overhead charges @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) Cost for 300 cum = a+b+c+d+e Rate per cum = (a+b+c+d+e)/300					
Note :- Quantities of aggregates provided under 'c' above are un-compacted quantities.							
4.08	403	Cement Treated Crushed Stone Sub base A Plant Mix Method Construction of granular sub-base by providing graded Material, mixing with cement in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with Mechanical Paver on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401 Laying Using Mechanical Paver Unit = cum Taking output = 250 cum					
		a) Labour					
		Mate	day	0.213	0.213	0.213	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	3.000			
		(ii) 200 tonne per hour	hour		3.750		
		(iii) 100 tonne per hour	hour			7.500	
		Electric generator					
		(i) 125 KVA	hour	3.000			
		(ii) 100 KVA	hour		3.750		
		(iii) 62.5 KVA	hour			7.500	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	7.110			
		(ii) 2.1 Cum Capacity	hour		10.517		
		(iii) 1 Cum Capacity	hour			21.948	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	525 x L1			
		(ii) 14 cum capacity	t.km		525 x L1		
		(iii) 10 cum capacity	t.km			525 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	6.000			

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		6.750		
		(iii) 10 cum capacity	hour			10.500	
		Mechanical Paver finisher	hour	3.000	3.750	3.750	
		Vibratory roller	hour	2.400	3.000	3.000	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.656 x L1 + 0.875			
		(ii) 12 KL capacity	hour		0.875 x L1 + 1.167		
		(iii) 6 KL capacity	hour			1.75 x L1 + 2.333	
		c) Material					
		Cement at site	tonne	13.125	13.125	13.125	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		(i) For Grading-III Material					
		26.5 mm to 9.5 mm @ 68 Percent	cum	228.846	228.846	228.846	
		9.5 mm to 4.75 mm @ 12 %	cum	40.385	40.385	40.385	
		4.75 mm below @ 20 Percent	cum	67.308	67.308	67.308	
		OR					
		(ii) For Grading-IV Material					
		26.5 mm to 9.5 mm @ 64 Percent	cum	215.385	215.385	215.385	
		9.5 mm to 4.75 mm @ 11 %	cum	37.019	37.019	37.019	
		4.75 mm below @ 25 Percent	cum	84.135	84.135	84.135	
		(i) Rate per cum for Grading-III Material					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 250 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
		(ii) Rate per cum for Grading-IV Material					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for hour cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.08	403	Cement Treated Crushed Stone Sub base					
		B By Mix in Place Method					
		Construction of granular sub-base by providing graded Material, mixing , carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface, mixing with cement at OMC and compacting with vibratory power roller to achieve the desired density, complete as per clause 401					
		Unit = cum					
		Taking output = 250 cum					
		By Mechanical Means					

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.532	0.532	0.532	
		Skilled mazdoor for alignment and geometrics	day	2.660	2.660	2.660	
		Mazdoor for spraying lime	day	10.640	10.640	10.640	
		b) Machinery					
		Front end loader for mixing at stock pile location					
		(i) 3.1 Cum Capacity	hour	5.319			
		(ii) 2.1 Cum Capacity	hour		7.813		
		(iii) 1 Cum Capacity	hour			16.667	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.385 x L1 + 1.847			
		(ii) 12 KL capacity	hour		1.847 x L1 + 2.463		
		(iii) 6 KL capacity	hour			3.694 x L1 + 4.926	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m2 per hour	hour	2.222	2.222	2.222	
		Binder Spreader	hour	2.222	2.222	2.222	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.304			
		(ii) Motor grader 3.70 metre blade	hour		2.779		
		(iii) Motor grader 3.35 metre blade	hour			3.099	
		Vibratory roller	hour	1.923	1.923	1.923	
		c) Material					
		Cement at site	tonne	13.125	13.125	13.125	
		Cost of water including water for curing	KL	99.750	99.750	99.750	
		For Grading-III Material					
		26.5 mm to 9.5 mm @ 68 Percent	cum	228.846	228.846	228.846	
		9.5 mm to 4.75 mm @ 12 %	cum	40.385	40.385	40.385	
		4.75 mm below @ 20 Percent	cum	67.308	67.308	67.308	
		OR					
		For Grading-IV Material					
		26.5 mm to 9.5 mm @ 64 Percent	cum	215.385	215.385	215.385	
		9.5 mm to 4.75 mm @ 11 %	cum	37.019	37.019	37.019	
		4.75 mm below @ 25 Percent	cum	84.135	84.135	84.135	
		(i) Rate per cum for Grading-III Material					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
		(ii) Rate per cum for Grading-IV Material					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for day cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.09	404.3.1	<p>Making 50 mm x 50 mm Furrows</p> <p>Making 50 mm x 50 mm furrows, 25mm/ 50mm deep, 450 to the center line of the road and at one metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres lead</p> <p>Unit = sqm</p> <p>Taking output = 30 m x 7 m = 210 sqm</p> <p>(i) 25mm deep furrow cutting</p> <p>a) Labour</p> <p>Mate day 0.106 0.106 0.106</p> <p>Mazdoor day 2.660 2.660 2.660</p> <p>b) Machinery</p> <p>Tractor-trolley hour 0.200 0.200 0.200</p> <p>c) Overhead charges @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c)</p> <p>Cost for 210 sqm= a+b+c+d</p> <p>Rate per sqm =(a+b+c+d)/210</p> <p>(ii) 50mm deep furrow cutting</p> <p>a) Labour</p> <p>Mate day 0.213 0.213 0.213</p> <p>Mazdoor day 5.320 5.320 5.320</p> <p>b) Machinery</p> <p>Tractor-trolley hour 0.400 0.400 0.400</p> <p>c) Overhead charges @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c)</p> <p>Cost for 210 sqm= a+b+c+d</p> <p>Rate per sqm =(a+b+c+d)/210</p>					
4.10	404.3.2	<p>Inverted Choke</p> <p>Construction of inverted choke by providing, laying, spreading and compacting screening B type/ coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with power roller etc</p> <p>Unit = cum</p> <p>Taking output = 600 cum</p> <p>a) Labour</p> <p>Mate day 1.224 1.224 1.224</p> <p>Mazdoor skilled day 2.660 2.660 2.660</p> <p>Mazdoor day 27.930 27.930 27.930</p> <p>b) Machinery</p> <p>Motor Grader</p> <p>(i) Motor grader 4.30 metre blade hour 5.530</p> <p>(ii) Motor grader 3.70 metre blade hour 6.670</p> <p>(iii) Motor grader 3.35 metre blade hour 7.438</p> <p>Vibratory roller 8-10 tonnes @ 60 cum per hour hour 6.000 6.000 6.000</p>					

CHAPTER: 4- SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.5 x L1 + 4.8			
		(ii) 12 KL capacity	hour		2 x L1 + 6.4		
		(iii) 6 KL capacity	hour			4 x L1 + 12.8	
		c) Material					
		Screening type 'B' or coarse sand	cum	720.000	720.000	720.000	
		Cost of water	KL	108.000	108.000	108.000	
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 600 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 600					
4.11	404	Water Bound Macadam					
		Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.					
		A By Manual Means					
		Unit = cum					
		Taking output = 360 Cum					
		a) Labour					
		Mate	day	13.406	13.406	13.406	
		Mazdoor skilled	day	2.660	2.660	2.660	
		Mazdoor	day	332.500	332.500	332.500	
		b) Machinery					
		Vibratory roller	hour	2.769	2.769	2.769	
		or					
		Smooth 3 wheeled steel roller @ 30cum/hour	hour	5.538	5.538	5.538	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	2 x L1 + 3.84			
		(ii) 12 KL capacity	hour		2.667 x L1 + 5.12		
		(iii) 6 KL capacity	hour			1.067 x L1 + 10.24	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Material (Refer table 400 - 7, 8 & 9)					
4.11 A	(i)	Grading-I					
		Aggregate					
		Grading-I 63 mm to 45 mm /Grading-II 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	435.600	435.600	
		Stone Screening					
		Type A 13.2 mm for grading-I@ 0.12 cum per 10 sqm	cum	57.600	57.600	57.600	
		OR					
		Crushable type such as Moorum or Gravel for grading I &II @ 0.22 cum per 10 sqm	cum	105.590	105.590	105.590	
		OR					
		Type B11.2 mm for grading-II @ 0.18 cum per 10 sqm	cum	86.400	86.400	86.400	
		Binding material					
		Binding Material @ 0.06cum per 10 sqm for grading I material	cum	28.800	28.800	28.800	
		Cost of water	KL	144.000	144.000	144.000	
4.11 A	(i)	(a) Using Screening Crushable type such as Moorum or Gravel					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
		OR					
4.11 A	(i)	(b) Using Screening Type-A (13.2mm agg.)					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
		OR					
4.11 A	(i)	(c) Using Screening Type-B (11.2mm agg.)					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
4.11 A	(ii)	Grading-II					
		Aggregate					
		Grading-II 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	435.600	435.600	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Stone Screening					
		Type B 11.2 mm for grading-II @ 0.18 cum per 10 sqm	cum	86.400	86.400	86.400	
		OR					
		Crushable type such as Moorum or Gravel for grading I & II @ 0.22 cum per 10 sqm	cum	105.590	105.590	105.590	
		Binding material					
		Binding Material @ 0.06cum per 10 sqm for grading I material	cum	28.800	28.800	28.800	
		Cost of water	KL	144.000	144.000	144.000	
4.11 A (ii)		(a) Using Screening Crushable type such as Moorum or Gravel					
		(d) Overhead charges @ on (a+b+c)					
		(e) Contractor's profit @ on (a+b+c+d)					
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
		OR					
4.11 A (ii)		(b) Using Screening Type-B (11.2mm agg.)					
		d) Overhead charges @ on (a+b+c)					
		e) Contractor's profit @ on (a+b+c+d)					
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
		(Anyone of the aggregate grading, screening and binding material may be used as per design)					
4.11		B By Mechanical Means:					
		Unit = cum					
		Taking output = 360 Cum					
		a) Labour					
		Mate	day	0.904	0.904	0.904	
		Mazdoor skilled	day	2.660	2.660	2.660	
		Mazdoor	day	19.950	19.950	19.950	
		b) Machinery					
		Front end loader for mixing at stock pile location					
		(i) 3.1 Cum Capacity	hour	7.660			
		(ii) 2.1 Cum Capacity	hour		11.250		
		(iii) 1 Cum Capacity	hour			24.000	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	3.318			
		(ii) Motor grader 3.70 metre blade	hour		4.002		
		(iii) Motor grader 3.35 metre blade	hour			4.463	
		Vibratory roller	hour	2.769	2.769	2.769	
		or					
		Smooth 3 wheeled steel roller	hour	5.538	5.538	5.538	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	2 x L1 + 3.84			
		(ii) 12 KL capacity	hour		2.667 x L1 + 5.12		
		(iii) 6 KL capacity	hour			5.333 x L1 + 10.24	
		c) Material (Refer table 400 - 7, 8 & 9)					
4.11 B	(i)	Grading-I					
		Aggregate					
		Grading-I 63 mm to 45 mm /Grading-II 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	435.600	435.600	
		Stone Screening					
		Type A 13.2 mm for grading-I@ 0.12 cum per 10 sqm	cum	57.600	57.600	57.600	
		OR					
		Crushable type such as Moorum or Gravel for grading I & II @ 0.22 cum per 10 sqm	cum	105.590	105.590	105.590	
		OR					
		Type B 11.2 mm for grading-II @ 0.18 cum per 10 sqm	cum	86.400	86.400	86.400	
		Binding material					
		Binding Material @ 0.06cum per 10 sqm for grading I material	cum	28.800	28.800	28.800	
		Cost of water	KL	144.000	144.000	144.000	
4.11 B (i)	(a)	Using Screening Crushable type such as Moorum or Gravel					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
		OR					
4.11 B (ii)	(b)	Using Screening Type-A (13.2mm agg.)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.11 B (ii)		(c) Using Screening Type-B (11.2mm agg.)					
		(d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		(e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
4.11 B	(ii)	Grading-II					
		Aggregate					
		Grading-II 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	435.600	435.600	
		Stone Screening					
		Type B11.2 mm for grading-II @ 0.18 cum per 10 sqm	cum	86.400	86.400	86.400	
		OR					
		Crushable type such as Moorum or Gravel for grading I & II @ 0.22 cum per 10 sqm	cum	105.590	105.590	105.590	
		Binding material					
4.11 B (iii)		(a) Using Screening Crushable type such as Moorum or Gravel					
		(d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		(e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
4.11 B (iii)		OR					
		(b) Using Screening Type-B (11.2mm agg.)					
		(d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		(e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 cum = a+b+c+d+e					
4.12	405	Crushed Cement Concrete Sub-base / Base					
		Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in Table 400.9 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L1 Km,					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material.					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					
		Mate	day	5.533	5.533	5.533	
		Mazdoor skilled	day	2.660	2.660	2.660	
		Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	135.660	135.660	135.660	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	3.318			
		(ii) Motor grader 3.70 metre blade	hour		4.002		
		(iii) Motor grader 3.35 metre blade	hour			4.463	
		Vibratory roller 8 - 10 tonne@ 60 cum per hour	hour	6.000	6.000	6.000	
		or					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	12.000	12.000	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.647			
		(ii) 2.1 Cum Capacity	hour		3.934		
		(iii) 1 Cum Capacity	hour			8.276	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	720 x L1			
		(ii) 14 cum capacity	t.km		720 x L1		
		(iii) 10 cum capacity	t.km			720 x L1	
		For loading & unloading time	hour				
		(i) 14 cum capacity	hour	2.647			
		(ii) 14 cum capacity	hour		3.934		
		(iii) 10 cum capacity	hour			8.276	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.8 x L1 + 1.536			
		(ii) 12 KL capacity	hour		1.067 x L1 + 2.048		
		(iii) 6 KL capacity	hour			2.133 x L1 + 4.096	
		c) Material					
		Material available from dismantled concrete slab after crushing / breaking and only carriage is required to be provided					
		Cost of water	KL	57.600	57.600	57.600	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 360 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/360

- Note**
1. It is assumed that dismantling of concrete slab/pavement has been considered separately. Hence same is not added in this analysis. Only labour for crushing the dismantled slab into aggregate has been added. Carriage from stock pile to work site has been provided with a lead of L1 Km
 2. In case of breaking of slabs is done locally without involvement of transportation, the provision of tipper, front end loader and loading/unloading charges may be deleted.
 3. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative.

4.13 405.2 **Penetration Coat Over Top Layer of Crushed Cement Concrete Base**

Spraying of bitumen over cleaned dry surface of crushed cement concrete base at the rate of 25 kg per 10 sqm by a bitumen pressure distributor, spreading of key aggregates at the rate of 0.13 cum per 10 sqm by a mechanical gritter and rolling the surface as per clause 506.3.8

Unit = sqm

Taking output = 7500 sqm

a) Labour			
Mate	day	0.745	0.745 0.745
Mazdoor skilled	day	2.660	2.660 2.660
Mazdoor	day	15.960	15.960 15.960
b) Machinery			
Mechanical broom (2.1m sweeping width)	hour	2.232	2.232 2.232
Hydraulic self propelled chips spreader	hour	5.140	5.140 5.140
Front end loader 1 cum bucket capacity	hour	6.000	6.000 6.000
Tipper 10 tonne capacity	hour	6.000	6.000 6.000
Vibratory roller 8 -10 tonnes	hour	5.140	5.140 5.140
Bitumen pressure distributor @ 1750 sqm per hour	hour	4.280	4.280 4.280
c) Material			
Crushed stone aggregate 11.2 mm size	cum	97.500	97.500 97.500
Bitumen (60-70 grade)	tonne	0.250	0.250 0.250
d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 7500 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/7500

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.14	406	A Wet Mix Macadam (Plant Mix Method) Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. Laying Using Mechanical Paver Unit = cum Taking output = 225 cum					
		a) Labour					
		Mate	day	0.213	0.213	0.213	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	2.829			
		(ii) 200 tonne per hour	hour		3.536		
		(iii) 100 tonne per hour	hour			7.071	
		Electric generator					
		(i) 125 KVA	hour	2.829			
		(ii) 100 KVA	hour		3.536		
		(iii) 62.5 KVA	hour			7.071	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.829			
		(ii) 2.1 Cum Capacity	hour		3.536		
		(iii) 1 Cum Capacity	hour			7.071	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	495 x L2			
		(ii) 14 cum capacity	t.km		495 x L2		
		(iii) 10 cum capacity	t.km			495 x L2	
		For loading & unloading time	hour				
		(i) 14 cum capacity	hour	5.657			
		(ii) 14 cum capacity	hour		7.071		
		(iii) 10 cum capacity	hour			10.607	
		Mechanical Paver finisher	hour	2.829	3.536	3.536	
		Vibratory roller	hour	2.263	2.829	2.829	
		c) Material					
		Material as per table 400-1					
		For Grading-I Material					
		45 mm to 22.4 mm@ 30 Percent	cum	95.192	95.192	95.192	
		22.4 mm to 2.36 mm @ 40 Percent	cum	126.923	126.923	126.923	
		2.36 mm to 75 micron@ 30 Percent	cum	95.192	95.192	95.192	
		Cost of water	KL	59.400	59.400	59.400	
		Rate per cum					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d) Cost for 225 cum = a+b+c+d+e Rate per cum = (a+b+c+d+e)/225					
4.14	406	B Wet Mix Macadam (Plant Mix Method) Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with grader in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. Laying Using Grader Unit = cum Taking output = 225 cum					
		a) Labour					
		Mate	day	0.213	0.213	0.213	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	2.829			
		(ii) 200 tonne per hour	hour		3.536		
		(iii) 100 tonne per hour	hour			7.071	
		Electric generator					
		(i) 125 KVA	hour	2.829			
		(ii) 100 KVA	hour		3.536		
		(iii) 62.5 KVA	hour			7.071	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.829			
		(ii) 2.1 Cum Capacity	hour		3.536		
		(iii) 1 Cum Capacity	hour			7.071	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	495 x L2			
		(ii) 14 cum capacity	t.km		495 x L2		
		(iii) 10 cum capacity	t.km			495 x L2	
		For loading & unloading time					
		(i) 14 cum capacity	hour	2.829			
		(ii) 14 cum capacity	hour		3.536		
		(iii) 10 cum capacity	hour			7.071	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.074			
		(ii) Motor grader 3.70 metre blade	hour		2.501		
		(iii) Motor grader 3.35 metre blade	hour			2.789	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Vibratory roller	hour	1.731	1.731	1.731	
		c) Material					
		Close graded Granular sub-base					
		Material as per table 400-1					
		For Grading-I Material					
		45 mm to 22.4 mm@ 30 Percent	cum	95.192	95.192	95.192	
		22.4 mm to 2.36 mm @ 40 Percent	cum	126.923	126.923	126.923	
		2.36 mm to 75 micron@ 30 Percent	cum	95.192	95.192	95.192	
		Cost of water	KL	59.400	59.400	59.400	
		Rate per cum					
		d) Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		e) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 225 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/225					
4.15	406	Cement Treated Crushed Stone Base (Plant Mix Method)					
		Providing, laying, spreading and compacting graded stone aggregate mixed with cement to crushed stone treated base specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.					
		Laying Using Mechanical Paver					
		Unit = cum					
		Taking output = 225 cum					
		a) Labour					
		Mate	day	0.213	0.213	0.213	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	2.829			
		(ii) 200 tonne per hour	hour		3.536		
		(iii) 100 tonne per hour	hour			7.071	
		Electric generator					
		(i) 125 KVA	hour	2.829			
		(ii) 100 KVA	hour		3.536		
		(iii) 62.5 KVA	hour			7.071	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.829			
		(ii) 2.1 Cum Capacity	hour		3.536		
		(iii) 1 Cum Capacity	hour			7.071	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	495 x L2			
		(ii) 14 cum capacity	t.km		495 x L2		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity	t.km			495 x L2	
		For loading & unloading time					
		(i) 14 cum capacity	hour	5.657			
		(ii) 14 cum capacity	hour		6.364		
		(iii) 10 cum capacity	hour			9.900	
		Vibratory roller	hour	2.263	2.263	2.263	
		Mechanical Paver finisher	hour	2.829	2.829	2.829	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1.444 x L1 + 1.733			
		(ii) 12 KL capacity	hour		1.925 x L1 + 2.31		
		(iii) 6 KL capacity	hour			3.85 x L1 + 4.62	
		c) Material					
		Close graded Granular sub-base					
		Material as per table 400-1					
		For Grading-I Material					
		45 mm to 22.4 mm@ 30 Percent	cum	95.192	95.192	95.192	
		22.4 mm to 2.36 mm @ 40 Percent	cum	126.923	126.923	126.923	
		2.36 mm to 75 micron@ 30 Percent	cum	95.192	95.192	95.192	
		Cost of cement @ 4%	Tonne	19.800	19.800	19.800	
		Cost of water	KL	163.350	163.350	163.350	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 225 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/225					
4.16	408	Construction of Median and Island with Soil Taken from Roadway Cutting					
		Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, graded and compacted as per clause 408					
		Unit = cum					
		Taking output = 21 cum					
		a) Labour					
		Mate	day	0.319	0.319	0.319	
		Mazdoor	day	7.980	7.980	7.980	
		b) Machinery					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.035 x L1 + 0.004			
		(ii) 12 KL capacity	hour		0.047 x L1 + 0.005		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.093 x L1 + 0.01	
		Plate compactor @ 3.5 cum per hour	hour	6.000	6.000	6.000	
c)		Material					
		Cost of water	KL	2.520	2.520	2.520	
d)		Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e)		Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 21 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/21					

Note This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on horticulture. In case granular fill is required to be paved, quantities of paving are required to be calculated as per approved design and paid separately.

4.17 408

Construction of Median and Island with Soil Taken from Borrow Areas

Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 408

Unit = cum

Taking output = 21 cum

a) Labour

Mate	day	0.106	0.106	0.106
Mazdoor	day	2.660	2.660	2.660

b) Machinery

Hydraulic Excavator

(i) 1.2 cum bucket capacity	hour	0.280		
(ii) 1.1 cum bucket capacity	hour		0.323	
(iii) 0.9 cum bucket capacity	hour			0.451

Tipper

For Transportation

(i) 14 cum capacity	t.km	31.5 x L2		
(ii) 14 cum capacity	t.km		31.5 x L2	
(iii) 10 cum capacity	t.km			31.5 x L2

For loading & unloading time

(i) 14 cum capacity	hour	0.280		
(ii) 14 cum capacity	hour		0.323	
(iii) 10 cum capacity	hour			0.451

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)

(i) 16 KL capacity	hour	0.035 x L1 + 0.002		
(ii) 12 KL capacity	hour		0.047 x L1 + 0.003	
(iii) 6 KL capacity	hour			0.093 x L1 + 0.006
Plate compactor	hour	1.400	1.400	1.400

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

c) Material

Compensation for earth taken from private land cum 21.000 21.000 21.000

Cost of water KL 2.520 2.520 2.520

d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 21 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/21

Note: This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on horticulture. In case surface finish is of hard type, the same may be provided separately as per approved design.

4.18 408

Construction of Shoulders

A. Earthen Shoulders

The rate as applicable for sub-grade construction may be adopted.

B. Hard Shoulders

Rate as applicable for sub-base and or base may be adopted as per approved design.

C. Paved shoulders

The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.

4.19 410

Footpaths and Separators

Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with pre-cast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel..

Unit = sqm

Taking output = 300 sqm

a) Labour

Mate day 1.809 1.809 1.809

Mason day 5.320 5.320 5.320

Mazdoor day 39.900 39.900 39.900

b) Machinery

Vibratory roller hour 0.750 0.750 0.750

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)

(i) 16 KL capacity hour 0.167 x L1 + 0.04

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 12 KL capacity	hour		0.222 x L1 + 0.053		
		(iii) 6 KL capacity	hour			0.444 x L1 + 0.107	
		Concrete mixer 0.4/0.28 cum per hour	hour	6.000	6.000	6.000	
		c) Material					
		i) For Granular sub base material					
		53 mm to 26.5 mm @ 35 Percent	cum	20.790	20.790	20.790	
		26.5 mm to 4.75 mm @ 45 Percent	cum	26.730	26.730	26.730	
		2.36 mm below @ 20 Percent	cum	11.880	11.880	11.880	
		ii) For cement concrete grade M15 7.5 cum					
		Aggregate 12 mm crushed @ 0.9 cum of concrete	cum	6.750	6.750	6.750	
		Sand @ 0.45 cum/cum of concrete	cum	3.380	3.380	3.380	
		Cement	tonne	1.880	1.880	1.880	
		iii) For cement plaster 1:3					
		Sand	cum	3.840	3.840	3.840	
		Cement	tonne	1.830	1.830	1.830	
		iv) Pre-cast cement concrete tiles					
		Tiles size 300 x 300 mm and 25 mm thick	each	3300.000	3300.000	3300.000	
		v) RCC pipes					
		Pipes 200 mm dia,2.5 m long for drainage	metre	22.500	22.500	22.500	
		vi) Cost of water	KL	12.000	12.000	12.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/300					
4.20	410	Crusher Run Macadam Base					
		Providing crushed stone aggregate, depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a vibratory roller to clause 417 to form a layer of sub-base/Base					
		Unit = cum					
		Taking output = 360 cum					
	A	By Mix in Place Method					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor skilled	day	2.660	2.660	2.660	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Tractor attached with rotavator @ 25 cum per hour	hour	12.000	12.000	12.000	
		Front end loader for mixing at stock pile location					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 3.1 Cum Capacity	hour	7.660			
		(ii) 2.1 Cum Capacity	hour		11.250		
		(iii) 1 Cum Capacity	hour			24.000	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	3.318			
		(ii) Motor grader 3.70 metre blade	hour		4.002		
		(iii) Motor grader 3.35 metre blade	hour			4.463	
		Vibratory roller	hour	2.769	2.769	2.769	
		or					
		Smooth 3 wheeled steel roller	hour	5.538	5.538	5.538	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.5 x L1 + 0.96			
		(ii) 12 KL capacity	hour		0.667 x L1 + 1.28		
		(iii) 6 KL capacity	hour			1.333 x L1 + 2.56	
		c) Material					
		i) For 53 mm maximum size					
		63 mm to 45 mm @ 33 Percent	cum	157.460	157.460	157.460	
		22.5 mm to 5.6 mm@ 32 Percent	cum	151.060	151.060	151.060	
		Below 5.6 mm @ 35 Percent	cum	166.680	166.680	166.680	
		Cost of water	KL	36.000	36.000	36.000	
		Or					
		ii) For 45 mm maximum size					
		45 mm to 22.5 mm@ 5 Percent	cum	24.120	24.120	24.120	
		22.4 mm to 5.6 mm@ 50 Percent	cum	237.600	237.600	237.600	
		Below 5.6 mm@ 45 Percent	cum	213.480	213.480	213.480	
		Cost of water	KL	36.000	36.000	36.000	
4.20 A		(i) For 53 mm maximum size					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360.0cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
		or					
4.20 A		(ii) For 45 mm maximum size					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360.0cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					

Note : Any one of the aggregate grading may be adopted

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.20	B	By Mixing Plant :					
		Unit = cum					
		Taking output = 225 Cum					
	a)	Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	7.980	7.980	7.980	
	b)	Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	2.571			
		(ii) 200 tonne per hour	hour		3.214		
		(iii) 100 tonne per hour	hour			6.429	
		Electric generator					
		(i) 125 KVA	hour	2.571			
		(ii) 100 KVA	hour		3.214		
		(iii) 62.5 KVA	hour			6.429	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.571			
		(ii) 2.1 Cum Capacity	hour		3.214		
		(iii) 1 Cum Capacity	hour			6.429	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.074			
		(ii) Motor grader 3.70 metre blade	hour		2.501		
		(iii) Motor grader 3.35 metre blade	hour			2.789	
		Vibratory roller	hour	2.571	2.571	2.571	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.3			
		(ii) 12 KL capacity	hour		0.333 x L1 + 0.4		
		(iii) 6 KL capacity	hour			0.667 x L1 + 0.8	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L2			
		(ii) 14 cum capacity	t.km		450 x L2		
		(iii) 10 cum capacity	t.km			450 x L2	
		For loading & unloading time					
		(i) 14 cum capacity	hour	2.571			
		(ii) 14 cum capacity	hour		3.214		
		(iii) 10 cum capacity	hour			6.429	
	c)	Material					
		Aggregate at site					
	i)	For 53 mm maximum size					
		63 mm to 45 mm @ 33 Percent	cum	98.400	98.400	98.400	
		22.5 mm to 5.6 mm @ 32 Percent	cum	94.410	94.410	94.410	
		Below 5.6 mm @ 35 Percent	cum	104.180	104.180	104.180	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Or					
		ii) For 45 mm maximum size					
		45 mm to 22.5 mm@ 5 Percent	cum	15.060	15.060	15.060	
		22.4 mm to 5.6 mm@ 50 Percent	cum	148.500	148.500	148.500	
		Below 5.6 mm@ 45 Percent	cum	133.430	133.430	133.430	
		Cost of water	KL	18.000	18.000	18.000	
4.20 B		(i) For 53 mm maximum size					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 225cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/225					
4.20 B		(ii) For 45 mm maximum size					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360.0cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/360					
4.21	Suggestive	<p>Lime, Fly ash Stabilised Soil Sub-Base</p> <p>Construction of Sub-base using lime - Flyash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50 Percent, Fly ash to conform to gradation as per clause 4.3 of IRC: 88-1984, lime + Fly ash content ranging between 10 to 30 Percent, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5kg/sq, cm and 25 Percent respectively, all as specified in IRC: 88-1984.</p> <p>Unit = cum</p> <p>Taking output = 480 cum (720 tonne, density 1.50 t/cum)</p> <p>Assumptions made</p> <p>Total mass taken for analysis = 720 t</p> <p>Lime + Fly ash admixture @ 20 Percent = 0.2 x 720=144 t</p> <p>Soil = 720 -144 = 576 t</p> <p>576 /1.6 = 360 cum</p> <p>Lime + Fly ash = 144 t</p> <p>Ratio Lime 4 : Fly ash 16</p> <p>Lime = 29 kg.</p> <p>Fly ash = 115 kg.</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	1.330	1.330	1.330	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.807			
		(ii) 1.1 cum bucket capacity	hour		5.536		
		(iii) 0.9 cum bucket capacity	hour			7.740	
		Tipper					
		For transportation					
		(i) 14 cum capacity	t.km	720 x L1			
		(ii) 14 cum capacity	t.km		720 x L1		
		(iii) 10 cum capacity	t.km			720 x L1	
		For Loading & unloading time					
		(i) 14 cum capacity	hour	4.807			
		(ii) 14 cum capacity	hour		5.536		
		(iii) 10 cum capacity	hour			7.740	
		Tractor with disc harrows for pulverisation	hour	6.000	6.000	6.000	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	3.773			
		(ii) Motor grader 3.70 metre blade	hour		4.551		
		(iii) Motor grader 3.35 metre blade	hour			5.075	
		Vibratory roller	hour	6.000	6.000	6.000	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.6 x L1 + 1.572			
		(ii) 12 KL capacity	hour		0.8 x L1 + 2.096		
		(iii) 6 KL capacity	hour			1.6 x L1 + 4.192	
		c) Material					
		Slaked Lime	tonne	29.000	29.000	29.000	
		Compensation for earth taken from private source	cum	360.000	360.000	360.000	
		Cost of water (considering 5% additional moisture required)	KL	43.200	43.200	43.200	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 480 cum = a+b+c+d+e					
		Rate per cum= (a+b+c+d+e)/480					

Note 1. Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

2. Cost of Fly ash has not been considered as same will be available free of cost. Only carriage of Fly ash has been provided.
3. Lime + Fly ash has been taken as 20 Percent of total mass and ratio of lime and Fly ash as 1:4 for estimating purposes. Total quantities will be as per approved design.

4.22 Suggestive

Granular crack relief layer

Granular crack relief layer laying Using Mechanical Paver (Providing, laying, spreading and compacting graded stone aggregate to Granular crack relief layer as per IRC SP-37 including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver over base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)

Unit = cum

Note :- Rate shall be taken from item no. - 4.14 A.

CHAPTER – 5

BASES AND SURFACE COURSE (BITUMINOUS)

PREAMBLES:

- 1 Various alternatives for machines and materials have been provided. The one that suits a particular situation and design may be adopted.
- 2 The clauses of MoRT&H Specifications have been mentioned for each item, may be referred for detailed specifications and construction procedure. The rate analyses mention only brief description.
- 3 The machinery and equipment included in analysis are as per specifications of MoRT&H and are mandatory. As per the present trend, contractors are procuring machinery and equipment of higher capacity.
- 4 The outputs taken for the construction equipment are for the compacted quantities of the relevant items and not for loose quantities.
- 5 In case of prime coat and tack coat, minimum quantities of binder indicated in specifications have been taken. Adjustment plus or minus can be made for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials.
- 6 The items of bituminous works under maintenance have been added in the Chapter on Maintenance.
- 7 Tack coat and prime coat, wherever provided are required to be measured and paid separately.
- 8 Brooming & Cleaning of surface is a part of the prime coat and tack coat. As such cleaning of surface has not been provided for bituminous courses as the same is already catered in prime/tack coat. However, for those cases where such coats are not required to be done, cleaning of surface shall be included.
- 9 It is presumed that tack coat, where required, will be provided immediately preceding the bituminous layer.
- 10 Rolling of bituminous courses is required to be done as per Clause 501.6. Provision in the analyses has accordingly been made. It has been observed during actual practice at work sites, that the availability of road roller is generally inadequate. As compaction is the key to good construction, this point is being specifically highlighted to ensure that road rollers are deployed at sites as per provision in the rate analyses.
- 11 Spreading of bituminous materials shall be done as per Clause 501.5.3.
- 12 The source of all materials to be used on the project must be tested and expressly approved by the Engineer.
- 13 Quantities of materials taken in the analyses are for the proposed of cost estimate only. The actual quantity shall be as per job mix formula.
- 14 Choice of grade of bitumen shall be made as per IRC - 37:2018
- 15 The specification and requirements for modified binders with various types of modifiers have been laid down in Clause 501.2.1 of MoRT&H Specifications and IRC : SP:53 which shall be followed.
- 16 The guidelines given vide Annexure – A to Clause 501 of MoRT&H Specifications in regard to protection of environment shall be followed for a particular situation.
- 17 The quantities taken as output of the item rate analysis are the compacted quantities and the quantities of aggregates taken under the head 'material' are the un-compacted quantities for the procurement purposes.
- 18 The approximate proportions by weight of different aggregates and bitumen necessary to produce the intended mix satisfying the job requirements and meeting the designated specifications are for estimating purpose only. The actual quantities should be worked out on the basis of job mix formula adopted for the job after working out the same in the laboratory for particular aggregates and bitumen approved by the Engineer.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.01	502	A Prime Coat over WMM/WBM					
		(i) Providing and applying primer coat with SS1 grade bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.70 kg/sum using mechanical means.					
		Unit = sqm					
		Taking output = 7000 Sqm					
		a) Labor					
		Mate	day	0.106	0.106	0.106	
		Maduro	day	2.660	2.660	2.660	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083	
		Air compressor 250 cfm	hour	2.083	2.083	2.083	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 4.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.146 x L1 + 0.613			
		(ii) 12 KL capacity	hour		0.194 x L1 + 0.817		
		(iii) 6 KL capacity	hour			0.389 x L1 + 1.633	
		c) Material					
		SS1 grade Bitumen emulsion @ 0.70 kg per sum	tonne	4.900	4.900	4.900	
		Cost of water	KL	10.500	10.500	10.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 7000 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/7000					

Note Bitumen primer has been provided @ 0.70 kg per sum as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

- (ii) Providing and applying primer coat with cutback MC 30 bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sum using mechanical means.

Unit = sqm

Taking output = 7000 Sqm

a) Labor

Mate	day	0.106	0.106	0.106
Maduro	day	2.660	2.660	2.660

b) Machinery

Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083
Air compressor 250 cfm	hour	2.083	2.083	2.083
Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 4.0 Km/hr.)

(I) 16 KL capacity	hour	0.146 x L1 + 0.613		
(ii) 12 KL capacity	hour		0.194 x L1 + 0.817	
(iii) 6 KL capacity	hour			0.389 x L1 + 1.633

c) Material

Cutback Bitumen MC 30 @ 0.60 kg per sum	tonne	4.200	4.200	4.200
Cost of water	KL	10.500	10.500	10.500

d) Overhead charges

@ on	@ on	@ on
(a+b+c)	(a+b+c)	(a+b+c)

e) Contractor's profit

@ on	@ on	@ on
(a+b+c+d)	(a+b+c+d)	(a+b+c+d)

Cost for 7000 Sqm = a+b+c+d+e

Rate per Sqm = (a+b+c+d+e)/7000

Note Bitumen primer has been provided @ 0.60 kg per sum as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.01	502	B Prime Coat over Stabilized soil bases/Crusher Run Macadam (i) Providing and applying primer coat with SS1 grade bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.90 kg/sum using mechanical means. Unit = sqm Taking output = 7000 Sqm					
		a) Labor					
		Mate	day	0.106	0.106	0.106	
		Maduro	day	2.660	2.660	2.660	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083	
		Air compressor 250 cfm	hour	2.083	2.083	2.083	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 4.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.146 x L1 + 0.613			
		(ii) 12 KL capacity	hour		0.194 x L1 + 0.817		
		(iii) 6 KL capacity	hour			0.389 x L1 + 1.633	
		c) Material					
		SS1 grade Bitumen emulsion @ 0.9 kg per sum	tonne	6.300	6.300	6.300	
		Cost of water	KL	10.500	10.500	10.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 7000 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/7000					

Note Bitumen primer has been provided @ 0.9 kg per sum as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

- (ii) Providing and applying primer coat with cutback MC 70 bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.90 kg/sum using mechanical means.

Unit = sqm

Taking output = 7000 Sqm

a) Labor

Mate	day	0.106	0.106	0.106
Maduro	day	2.660	2.660	2.660

b) Machinery

Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083
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Air compressor 250 cfm	hour	2.083	2.083	2.083
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Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944
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Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 4.0 Km/hr.)

(i) 16 KL capacity	hour	0.146 x L1 + 0.613		
(ii) 12 KL capacity	hour		0.194 x L1 + 0.817	
(iii) 6 KL capacity	hour			0.389 x L1 + 1.633

c) Material

Cutback Bitumen MC 70 @ 0.9 kg per sum	tonne	6.300	6.300	6.300
Cost of water	KL	10.500	10.500	10.500

d) Overhead charges

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
--------------	--------------	--------------

e) Contractor's profit

@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
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Cost for 7000 Sqm = a+b+c+d+e

Rate per Sqm = (a+b+c+d+e)/7000

Note Bitumen primer has been provided @ 0.9 kg per sum as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

5.02 503 (i) Tack Coat on Bituminous surfaces

Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sum on the prepared bituminous surface cleaned with mechanical broom.

Unit = sqm

Taking output = 7000 Sqm

a) Labor

Mate	day	0.106	0.106	0.106
Maduro	day	2.660	2.660	2.660

b) Machinery

Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083
Air compressor 250 cfm	hour	2.083	2.083	2.083
Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944

c) Material

Bitumen emulsion @ 0.20 kg per sum	tonne	1.400	1.400	1.400
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d) Overhead charges

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
--------------	--------------	--------------

e) Contractor's profit

@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
----------------	----------------	----------------

Cost for 7000 Sqm = a+b+c+d+e

Rate per Sqm = (a+b+c+d+e)/7000

Note:

Bitumen emulsion has been provided @ 0.20 kg per sum as per clause 503.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and actual quantity approved by the Engineer after preliminary trials referred to in clause No. 503.4.3.

5.02 503 (ii) Tack Coat on Granular surfaces treated with primer

Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.25 kg per sum on the prepared bituminous surface cleaned with mechanical broom.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Unit = sqm

Taking output = 7000 Sqm

a) Labor

Mate	day	0.106	0.106	0.106
Maduro	day	2.660	2.660	2.660

b) Machinery

Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083
Air compressor 250 cfm	hour	2.083	2.083	2.083
Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944

c) Material

Bitumen emulsion @ 0.25 kg per sum	tonne	1.750	1.750	1.750
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d) Overhead charges

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
-----------------	-----------------	-----------------

e) Contractor's profit

@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
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Cost for 7000 Sqm = a+b+c+d+e

Rate per Sqm = (a+b+c+d+e)/7000

- Note**
1. Bitumen emulsion has been provided @ 0.25 kg per sum as per clause 503.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and actual quantity approved by the Engineer after preliminary trials referred to in clause No. 503.4.3
 2. An output of 7000 sum has been considered in case of prime coat and tack coat which can be covered by bituminous courses on the same day.

5.02 503 (iii) Tack Coat on Cement concrete pavement

Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.30 kg per sum on the prepared bituminous surface cleaned with mechanical broom.

Unit = sqm

Taking output = 7000 Sqm

a) Labor

Mate	day	0.106	0.106	0.106
Maduro	day	2.660	2.660	2.660

b) Machinery

Mechanical broom (2.1m sweeping width)	hour	2.083	2.083	2.083
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CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Air compressor 250 cfm	hour	2.083	2.083	2.083	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.944	1.944	1.944	
		c) Material					
		Bitumen emulsion @ 0.30 kg per sum	tonne	2.100	2.100	2.100	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 7000 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/7000					

- Note**
1. Bitumen emulsion has been provided @ 0.30 kg per sum as per clause 503.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and actual quantity approved by the Engineer after preliminary trials referred to in clause No. 503.4.3
 2. An output of 7000 sum has been considered in case of prime coat and tack coat which can be covered by bituminous courses on the same day.

5.03	504	(i) Bituminous Macadam Grading – I
		Providing and laying bituminous macadam with higher capacity hot mix plant using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction
		Unit = cum
		Taking output = 205 cum
		a) Labor
		Mate day 0.585 0.585 0.585
		Maduro day 7.980 7.980 7.980
		Maduro skilled day 6.650 6.650 6.650
		b) Machinery
		Batch Type Hot Mix Plant

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(I) HMP 200 TPH	hour	3.221			
		(ii) HMP 160 TPH	hour		4.027		
		(iii) HMP 120 TPH	hour			5.369	
		Mechanical broom (2.1m sweeping width)	hour	0.697	0.697	0.697	
		Air compressor 250 cfm	hour	0.697	0.697	0.697	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(I) Paver (240HP)	hour	3.221			
		(ii) Paver (240HP)	hour		4.027		
		(iii) Paver (174HP)	hour			5.369	
		Electric generator					
		(I) 500 KVA	hour	3.221			
		(ii) 400 KVA	hour		4.027		
		(iii) 250 KVA	hour			5.369	
		Front end loader for feeding the plant					
		(I) 3.1 Cum Capacity	hour	5.528			
		(ii) 2.1 Cum Capacity	hour		8.177		
		(iii) 1 Cum Capacity	hour			17.065	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	451 x L1			
		(ii) 14 cum capacity	t.km		451 x L1		
		(iii) 10 cum capacity	t.km			451 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.443			
		(ii) 14 cum capacity	hour		8.054		
		(iii) 10 cum capacity	hour			10.738	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	8.638	8.638	8.638	
		c) Material					
		I) Bitumen@ 3.3 Percent of mix	tonne	14.883	14.883	14.883	
		weight of mix = 205 x 2.2 = 451 tone					
		ii) Aggregate					
		Total weight of mix =	451.00	tonnes			
		Weight of bitumen =	14.88	tonnes			
		Weight of aggregate =	436.12	tonnes			
		Taking density of aggregate = 1.5 ton/cum					
		*Grading I (40 mm nominal size)					
		37.5 - 25 mm 15 Percent	cum	43.612	43.612	43.612	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		25 - 10 mm 45 Percent	cum	130.835	130.835	130.835	
		10 - 5 mm 25 Percent	cum	72.686	72.686	72.686	
		5 mm and below 15 Percent	cum	14.537	14.537	14.537	
		* Any one of the alternative may be adopted as per approved design					
		(i) for Grading I (40 mm nominal size)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					
		Note					
		1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		2. Labor for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		3. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 tandoors for the same shall be deleted as the same has been included in the cost of tack coat					
5.03	504	(ii) Bituminous Macadam Grading –II					
		Providing and laying bituminous macadam with higher capacity hot mix plant using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction					
		Unit = cum					
		Taking output = 205 cum					
		a) Labor					
		Mate	day	0.585	0.585	0.585	
		Maduro	day	7.980	7.980	7.980	
		Maduro skilled	day	6.650	6.650	6.650	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Batch Type Hot Mix Plant					
		(I) HMP 200 TPH	hour	3.221			
		(ii) HMP 160 TPH	hour		4.027		
		(iii) HMP 120 TPH	hour			5.369	
		Mechanical broom (2.1m sweeping width)	hour	0.976	0.976	0.976	
		Air compressor 250 cfm	hour	0.976	0.976	0.976	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.221			
		(ii) Paver (240HP)	hour		4.027		
		(iii) Paver (174HP)	hour			5.369	
		Electric generator					
		(i) 500 KVA	hour	3.221			
		(ii) 400 KVA	hour		4.027		
		(iii) 250 KVA	hour			5.369	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.136			
		(ii) 2.1 Cum Capacity	hour		9.076		
		(iii) 1 Cum Capacity	hour			18.942	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	451 x L1			
		(ii) 14 cum capacity	t.km		451 x L1		
		(iii) 10 cum capacity	t.km			451 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.443			
		(ii) 14 cum capacity	hour		8.054		
		(iii) 10 cum capacity	hour			10.738	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	12.094	12.094	12.094	
		c) Material					
		i) Bitumen@ 3.4 Percent of mix	tonne	15.334	15.334	15.334	
		weight of mix = 205 x 2.2 = 451 tonne					
		ii) Aggregate					
		Total weight of mix =	451.00	tonnes			
		Weight of bitumen =	15.33	tonnes			
		Weight of aggregate =	435.67	tonnes			
		Taking density of aggregate = 1.5 ton/cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Grading II(19 mm nominal size)

25 - 10 mm 40 Percent	cum	116.178	116.178	116.178
10 - 5 mm 40 Percent	cum	116.178	116.178	116.178
5 mm and below 20 Percent	cum	58.089	58.089	58.089

* Any one of the alternative may be adopted as per approved design

(ii) for Grading II(19 mm nominal size)

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 205 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/205

Note

1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.
2. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.
3. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 mazdoors for the same shall be deleted as the same has been included in the cost of tack coat.

5.04

505

A

Dense Graded Bituminous Macadam Grading -I

Providing and laying dense graded bituminous macadam with higher capacity batch type HMP using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 Percent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 505 complete in all respects.

Unit = cum

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Taking output = 195 cum							
a) Labour							
		Mate	day	0.585	0.585	0.585	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	6.650	6.650	6.650	
b) Machinery							
Hot Mix Plant							
		(i) HMP 200 TPH	hour	3.218			
		(ii) HMP 160 TPH	hour		4.022		
		(iii) HMP 120 TPH	hour			5.363	
		Mechanical broom (2.1m sweeping width)	hour	0.663	0.663	0.663	
		Air compressor 250 cfm	hour	0.663	0.663	0.663	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.218			
		(ii) Paver (240HP)	hour		4.022		
		(iii) Paver (174HP)	hour			5.363	
Electric generator							
		(i) 500 KVA	hour	3.218			
		(ii) 400 KVA	hour		4.022		
		(iii) 250 KVA	hour			5.363	
Front end loader for feeding the plant							
		(i) 3.1 Cum Capacity	hour	6.151			
		(ii) 2.1 Cum Capacity	hour		9.099		
		(iii) 1 Cum Capacity	hour			18.989	
Tipper							
		For Transportation					
		(i) 14 cum capacity	t.km	450.45 x L1			
		(ii) 14 cum capacity	t.km		450.45 x L1		
		(iii) 10 cum capacity	t.km			450.45 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.435			
		(ii) 14 cum capacity	hour		8.044		
		(iii) 10 cum capacity	hour			10.725	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.504	11.504	11.504	
c) Material							
		i) Bitumen@ 4 Percent of mix	tonne	18.018	18.018	18.018	
		weight of mix = 205 x 2.2 = 451 tonne					
ii) Aggregate							
		Total weight of mix =	450.45	tonnes			
		Weight of bitumen =	18.02	tonnes			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Weight of aggregate =	432.43	tonnes			
		Taking density of aggregate = 1.5 ton/cum					
		Grading - 140 mm (Nominal Size)					
		37.5 - 25 mm 22 Percent	cum	63.423	63.423	63.423	
		25 - 10 mm 13 Percent	cum	37.477	37.477	37.477	
		10 - 4.75 mm 19 Percent	cum	54.775	54.775	54.775	
		4.75 mm and below 44 Percent	cum	126.847	126.847	126.847	
		Filler @ 2 Percent of weight of aggregates.	tonne	8.649	8.649	8.649	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 195 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/195					
5.04	505	B Dense Graded Bituminous Macadam Grading -II					
		Providing and laying dense graded bituminous macadam with higher capacity batch type HMP using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 Percent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 505 complete in all respects.					
		Unit = cum					
		Taking output = 195 cum					
		a) Labour					
		Mate	day	0.585	0.585	0.585	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.218			
		(ii) HMP 160 TPH	hour		4.022		
		(iii) HMP 120 TPH	hour			5.363	
		Mechanical broom (2.1m sweeping width)	hour	0.663	0.663	0.663	
		Air compressor 250 cfm	hour	0.663	0.663	0.663	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.218			
		(ii) Paver (240HP)	hour		4.022		
		(iii) Paver (174HP)	hour			5.363	
		Electric generator					
		(i) 500 KVA	hour	3.218			
		(ii) 400 KVA	hour		4.022		
		(iii) 250 KVA	hour			5.363	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.119			
		(ii) 2.1 Cum Capacity	hour		9.052		
		(iii) 1 Cum Capacity	hour			18.891	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450.45 x L1			
		(ii) 14 cum capacity	t.km		450.45 x L1		
		(iii) 10 cum capacity	t.km			450.45 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.435			
		(ii) 14 cum capacity	hour		8.044		
		(iii) 10 cum capacity	hour			10.725	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.504	11.504	11.504	
		c) Material					
		i) Bitumen@ 4.5 Percent of mix	tonne	20.270	20.270	20.270	
		ii) Aggregate					
		Total weight of mix =	450.45	tonnes			
		Weight of bitumen =	20.27	tonnes			
		Weight of aggregate =	430.18	tonnes			
		Taking density of aggregate = 1.5 ton/cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Grading - II19 mm (Nominal Size)

25 - 10 mm 30 Percent	cum	86.036	86.036	86.036
10 - 5 mm 28 Percent	cum	80.300	80.300	80.300
5 mm and below 40 Percent	cum	114.715	114.715	114.715
Filler @ 2 Percent of weight of aggregates.	cum	8.604	8.604	8.604

* Any one of the alternative may be adopted as per approved design

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 195 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/195

Note

- Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.
- Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.
- In case DBM is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.
- The average density of 1.5 tonne/cum is only a reference density in this Data Book.
- The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e. excluding the weight of bitumen. The weight of filler will also be 2 Percent by weight of dry aggregates.

5.05 507 A Bituminous Concrete Grading -I

Providing and laying bituminous concrete with higher capacity batch type hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder @ 5.2 Percent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		achieve the desired compaction as per MORTH specification clause No. 507 complete in all respects Unit = cum Taking output = 191 cum					
		a) Labour					
		Mate	day	0.585	0.585	0.585	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.220			
		(ii) HMP 160 TPH	hour		4.025		
		(iii) HMP 120 TPH	hour			5.366	
		Mechanical broom (2.1m sweeping width)	hour	1.137	1.137	1.137	
		Air compressor 250 cfm	hour	1.137	1.137	1.137	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.220			
		(ii) Paver (240HP)	hour		4.025		
		(iii) Paver (174HP)	hour			5.366	
		Electric generator					
		(i) 500 KVA	hour	3.220			
		(ii) 400 KVA	hour		4.025		
		(iii) 250 KVA	hour			5.366	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.079			
		(ii) 2.1 Cum Capacity	hour		8.992		
		(iii) 1 Cum Capacity	hour			18.765	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450.76 x L1			
		(ii) 14 cum capacity	t.km		450.76 x L1		
		(iii) 10 cum capacity	t.km			450.76 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.439			
		(ii) 14 cum capacity	hour		8.049		
		(iii) 10 cum capacity	hour			10.732	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	14.085	14.085	14.085	
		Pneumatic Tyre roller	hour	2.849	3.220	4.293	

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Material					
		i) Bitumen@ 5.2 Percent of mix	tonne	23.440	23.440	23.440	
		ii) Aggregate					
		Total weight of mix =	450.76	tonnes			
		Weight of bitumen =	23.44	tonnes			
		Weight of aggregate =	427.32	tonnes			
		Taking density of aggregate = 1.5 ton/cum					
		* Grading - I-19 mm (Nominal Size)					
		20 - 10 mm 38 Percent	cum	108.255	108.255	108.255	
		10 - 5 mm 17 Percent	cum	48.430	48.430	48.430	
		5 mm and below 43 Percent	cum	122.499	122.499	122.499	
		Filler @ 2 Percent of weight of aggregates.	cum	8.546	8.546	8.546	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 191 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/191					
5.05	507	B Bituminous Concrete Grading -II					
		Providing and laying bituminous concrete with higher capacity batch type hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 Percent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 507 complete in all respects					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = cum					
		Taking output = 191 cum					
		a) Labour					
		Mate	day	0.585	0.585	0.585	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.220			
		(ii) HMP 160 TPH	hour		4.025		
		(iii) HMP 120 TPH	hour			5.366	
		Mechanical broom	hour	1.624	1.624	1.624	
		(2.1m sweeping width)					
		Air compressor 250 cfm	hour	1.624	1.624	1.624	
		Paver finisher					
		hydrostatic with sensor					
		control compatible with					
		the hot mix plant					
		(i) Paver (240HP)	hour	3.220			
		(ii) Paver (240HP)	hour		4.025		
		(iii) Paver (174HP)	hour			5.366	
		Electric generator					
		(i) 500 KVA	hour	3.220			
		(ii) 400 KVA	hour		4.025		
		(iii) 250 KVA	hour			5.366	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.994			
		(ii) 2.1 Cum Capacity	hour		8.853		
		(iii) 1 Cum Capacity	hour			18.563	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450.76 x L1			
		(ii) 14 cum capacity	t.km		450.76 x L1		
		(iii) 10 cum capacity	t.km			450.76 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.439			
		(ii) 14 cum capacity	hour		8.049		
		(iii) 10 cum capacity	hour			10.732	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	20.121	20.121	20.121	
		Pneumatic Tyre roller	hour	2.849	3.220	4.293	
		c) Material					
		i) Bitumen@ 5.4 Percent of mix	tonnes	24.341	24.341	24.341	
		ii) Aggregate					
		Total weight of mix =	450.760	tonnes			
		Weight of bitumen =	24.341	tonnes			

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Weight of aggregate = 426.419 Tonnes

Taking density of aggregate = 1.5 ton/cum

13.2 - 10 mm 21 Percent	cum	59.825	99.498	99.498
10 - 5 mm 17 Percent	cum	48.430	48.430	48.430
5 mm and below 60 Percent	cum	170.928	170.928	170.928
Filler @ 2 Percent of weight of aggregates.	cum	8.528	8.528	8.528

* Any one of the alternative may be adopted as per approved design

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 191 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/ 191

- Note**
- *1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.
 2. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.
 3. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.
 4. The average density of 1.5 tonne/cum is only a reference density in this Data Book.
 5. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e. excluding the weight of bitumen. The weight of filler will also be 2 Percent by weight of dry aggregates.

5.06 509

Surface Dressing

Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller

Unit = sqm

Taking output = 9000 Sqm

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

5.06

Case -I :-19 mm nominal chipping size

a) Labour							
Mate	day	0.585	0.585	0.585			
Mazdoor	day	11.970	11.970	11.970			
Mazdoor skilled	day	2.660	2.660	2.660			
b) Machinery							
Mechanical broom (2.1m sweeping width)	hour	2.679	2.679	2.679			
Air compressor 250 cfm	hour	2.679	2.679	2.679			
Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.250	1.250	1.250			
Hydraulic self-propelled chip spreader	hour	7.401	7.401	7.401			
Front end loader for feeding the plant							
(i) 3.1 Cum Capacity	hour	0.978					
(ii) 2.1 Cum Capacity	hour		1.452				
(iii) 1 Cum Capacity	hour					3.068	
Tipper							
For Transportation							
(i) 14 cum capacity	t.km	202.5 x L1					
(ii) 14 cum capacity	t.km		202.5 x L1				
(iii) 10 cum capacity	t.km					202.5 x L1	
For loading & unloading time							
(i) 14 cum capacity	hour	8.380					
(ii) 14 cum capacity	hour		8.853				
(iii) 10 cum capacity	hour					10.469	
Smooth steel wheeled tandem roller for static and vibratory passages	hour	7.111	7.111	7.111			
Pneumatic Tyre roller	hour	7.111	7.111	7.111			
c) Material							
Bitumen@ 1.20 kg per sqm	tonne	10.800	10.800	10.800			
Crushed stone chipping,19 mm nominal size @ 0.015 cum per sqm	cum	135.000	135.000	135.000			
d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)			
e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)			

Cost for 9000 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/9000

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.06	509	Case - II 13 mm nominal size chipping					
		Unit = sqm					
		Taking output = 9000 Sqm					
		a) Labour					
		Mate	day	0.585	0.585	0.585	
		Mazdoor	day	11.970	11.970	11.970	
		Mazdoor skilled	day	2.660	2.660	2.660	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	2.679	2.679	2.679	
		Air compressor 250 cfm	hour	2.679	2.679	2.679	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	1.250	1.250	1.250	
		Hydraulic self-propelled chip spreader	hour	7.401	7.401	7.401	
		Front end loader for loading					
		(i) 3.1 Cum Capacity	hour	0.646			
		(ii) 2.1 Cum Capacity	hour		0.957		
		(iii) 1 Cum Capacity	hour			2.015	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	135 x L1			
		(ii) 14 cum capacity	t.km		135 x L1		
		(iii) 10 cum capacity	t.km			135 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	8.047			
		(ii) 14 cum capacity	hour		8.359		
		(iii) 10 cum capacity	hour			9.416	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	4.741	4.741	4.741	
		Pneumatic Tyre roller	hour	4.741	4.741	4.741	
		c) Material					
		Bitumen@ 1.20 kg per sqm	tonne	9.000	9.000	9.000	
		Crushed stone chipping,13 mm nominal size @ 0.015 cum per sqm	cum	90.000	90.000	90.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

e) Contractor's profit

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

$$\text{Cost for 9000 sqm} = a+b+c+d+e$$

Rate per sqm = (a+b+c+d+e)/9000

Note

1. Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder as per clause 510.2.4. Alternatively, chips may be pre-coated as per clause 510.2.5
2. Input for the second coat, where required, will be the same as per the 1st coat mentioned above.

5.07

510

Open - Graded Premix Surfacing

Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates using Viscosity grade bitumen to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable hot mix plant of appropriate capacity not less than 200 tonnes/hour, laying and rolling with a smooth wheeled roller, finished to required level and grades.

Unit = cum

Taking output = 10250 Sqm

a) Labour

Mate	day	0.585	0.585	0.585
Mazdoor	day	7.980	7.980	7.980
Mazdoor skilled	day	6.650	6.650	6.650

b) Machinery

Hot Mix Plant

(i) HMP 200 TPH	hour	3.456	
(ii) HMP 160 TPH	hour		4.320
(iii) HMP 120 TPH	hour		5.760

**Mechanical broom
(2.1m sweeping width)**

Mechanical broom	hour	1.220	1.220	1.220
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Air compressor 250 cfm

Air compressor 250 cfm	hour	1.220	1.220	1.220
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Paver finisher
hydrostatic with sensor
control compatible with
the hot mix plant

(i) Paver (240HP)	hour	3.456
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CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) Paver (240HP)	hour		4.320		
		(iii) Paver (174HP)	hour			5.760	
		Electric generator					
		(i) 500 KVA	hour	3.456			
		(ii) 400 KVA	hour		4.320		
		(iii) 250 KVA	hour			5.760	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.888			
		(ii) 2.1 Cum Capacity	hour		8.648		
		(iii) 1 Cum Capacity	hour			18.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	483.8 x L1			
		(ii) 14 cum capacity	t.km		483.8 x L1		
		(iii) 10 cum capacity	t.km			483.8 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	6.911			
		(ii) 14 cum capacity	hour		8.639		
		(iii) 10 cum capacity	hour			11.519	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	21.596	21.596	21.596	
		c) Material					
		Bitumen @ 14.60 kg per 10 sqm	tonne	14.965	14.965	14.965	
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	276.750	276.750	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10250 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/10250					
5.08	508	Close Graded Premix Surfacing/Mixed Seal Surfacing					
		Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Viscosity grade bitumen to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable hot mix plant of appropriate capacity not less than 200 tonnes/hour, laying and rolling with a smooth wheeled roller, finished to required level and grades.					
		Unit = cum					
		Taking output = 10250 Sqm					
		a) Labour					
		Mate	day	0.585	0.585	0.585	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.456			
		(ii) HMP 160 TPH	hour		4.320		
		(iii) HMP 120 TPH	hour			5.760	
		Mechanical broom (2.1m sweeping width)	hour	1.220	1.220	1.220	
		Air compressor 250 cfm	hour	1.220	1.220	1.220	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.456			
		(ii) Paver (240HP)	hour		4.320		
		(iii) Paver (174HP)	hour			5.760	
		Electric generator					
		(i) 500 KVA	hour	3.456			
		(ii) 400 KVA	hour		4.320		
		(iii) 250 KVA	hour			5.760	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	3.456			
		(ii) 2.1 Cum Capacity	hour		8.648		
		(iii) 1 Cum Capacity	hour			18.450	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	483.8 x L1			
		(ii) 14 cum capacity	t.km		483.8 x L1		
		(iii) 10 cum capacity	t.km			483.8 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	6.911			

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		8.639		
		(iii) 10 cum capacity	hour			11.519	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	21.596	21.596	21.596	
		c) Material					
		Type - A					
		* Bitumen@ 22 kg per 10 sqm	tonne	22.550	22.550	22.550	
		Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	276.750	276.750	
		or					
		Type - B					
		Bitumen @ 19 kg per 10 sqm	tonne	19.475	19.475	19.475	
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	276.750	276.750	
		* Any one of the alternative may be adopted as per approved design					
		Type - A					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10250 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/10250					
		Type - B					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10250 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/10250					
5.09	511	Seal Coat					
		Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
(i) Case - I : Type A							
Unit = Sqm							
Taking output = 10250 Sqm							
a) Labour							
		Mate	day	0.319	0.319	0.319	
		Mazdoor	day	7.980	7.980	7.980	
b) Machinery							
		Mechanical broom (2.1m sweeping width)	hour	3.051	3.051	3.051	
		Air compressor 250 cfm	hour	3.051	3.051	3.051	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	2.847	2.847	2.847	
		Hydraulic self-propelled chip spreader	hour	8.429	8.429	8.429	
Front end loader							
		(i) 3.1 Cum Capacity	hour	0.668			
		(ii) 2.1 Cum Capacity	hour		0.992		
		(iii) 1 Cum Capacity	hour			2.097	
Tipper							
		For loading time					
		(i) 14 cum capacity	hour	0.668			
		(ii) 14 cum capacity	hour		0.992		
		(iii) 10 cum capacity	hour			2.097	
		For Transportation					
		(i) 14 cum capacity	t.km	202.95 x L1			
		(ii) 14 cum capacity	t.km		202.95 x L1		
		(iii) 10 cum capacity	t.km			202.95 x L1	
		For unloading time					
		(i) 14 cum capacity	hour	8.429			
		(ii) 14 cum capacity	hour		8.429		
		(iii) 10 cum capacity	hour			8.429	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	4.859	4.859	4.859	
c) Material							
		Bitumen@ 9.80 kg per 10 sqm	tonne	10.045	10.045	10.045	
		Crushed stone chipping of 6.7 mm size defined as 100 Percent passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.09 cum per 10 sqm	cum	92.250	92.250	92.250	
d) Overhead charges							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

e) Contractor's profit

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

Cost for 10250 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/10250

Note Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.

5.09

(ii) Case - II : Type B

Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 200 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.

Unit = Sqm

Taking output = 7860 Sqm

a) Labour

Mate	day	0.585	0.585	0.585
Mazdoor	day	7.980	7.980	7.980
Mazdoor skilled	day	6.650	6.650	6.650

b) Machinery

Hot Mix Plant

(i) HMP 200 TPH	hour	0.337		
(ii) HMP 160 TPH	hour		0.421	
(iii) HMP 120 TPH	hour			0.561
Mechanical broom (2.1m sweeping width)	hour	2.339	2.339	2.339
Air compressor 250 cfm	hour	2.339	2.339	2.339

Paver finisher
hydrostatic with sensor
control compatible with
the hot mix plant

(i) Paver (240HP)	hour	0.337		
(ii) Paver (240HP)	hour		0.421	
(iii) Paver (174HP)	hour			0.561

Electric generator

(i) 500 KVA	hour	0.337		
(ii) 400 KVA	hour		0.421	
(iii) 250 KVA	hour			0.561

**Front end loader for
feeding the plant**

(i) 3.1 Cum Capacity	hour	0.996		
(ii) 2.1 Cum Capacity	hour		1.474	
(iii) 1 Cum Capacity	hour			3.076

Tipper

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For Transportation					
		(i) 14 cum capacity	t.km	103.752 x L1			
		(ii) 14 cum capacity	t.km		103.752 x L1		
		(iii) 10 cum capacity	t.km			103.752 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	0.674			
		(ii) 14 cum capacity	hour		0.842		
		(iii) 10 cum capacity	hour			1.123	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	2.484	2.484	2.484	
		c) Material					
		Bitumen@ 6.80 kg per 10 sqm	tonne	5.345	5.345	5.345	
		Crushed stone chipping of 6.7 mm size defined as passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.06 cum per 10 sqm	cum	47.160	47.160	47.160	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 7860 Sqm = a+b+c+d+e					
		Rate per Sqm. = (a+b+c+d+e)/7860					

5.10 520

Supply of Stone Aggregates for Pavement Courses

Supply of stone aggregates from approved sources conforming to the physical requirement, specified in the respective specified clauses, including royalties, fees rents, collection, transportation, stacking and testing and measured in cum as per clause 520

Competitive market rates to be ascertained. Alternatively, rates for stone crushing given in chapter 1 may be adopted, if found economical. In case for supply of aggregates at site

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

are not available, nearest crusher site may be ascertained. Loading and unloading charges and cost of carriage may be added to these rates to arrive at the cost at site.

5.11 516

Mastic Asphalt

Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-39, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated finegrained hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces is not less than 100°C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 516.

Unit = sqm

Taking output = 35 sqm

a) Labour

Mate	day	0.585	0.585	0.585
Mazdoor	day	13.300	13.300	13.300
Mazdoor skilled	day	1.330	1.330	1.330

b) Machinery

Mechanical broom (2.1m sweeping width)	hour	0.010	0.010	0.010
Air compressor 250 cfm	hour	0.010	0.010	0.010
Mastic cooker 1 tonne capacity	hour	3.000	3.000	3.000
Bitumen boiler 1500 litres capacity	hour	3.000	3.000	3.000
Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	1.000	1.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Material					
		Base mastic (without coarse aggregates) = 60 Percent					
		Coarse aggregate (6.3mm to 13.2 mm) = 40 Percent.					
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRR I for a specific case)					
		i) Bitumen 85/25 or 30/40 @ 10.2 Percent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.205	0.205	0.205	
		ii) Fine aggregate passing 2.36mm and retained on 0.075mm sieve @ 31.9 Percent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.395	0.395	0.395	
		iii) Lime stone dust filler with calcium content not less than 80 Percent by weight @ 17.92 Percent by weight of mix = $2 \times 17.92/100 = 0.36$	tonne	0.361	0.361	0.361	
		iv) Coarse aggregates 6.3 mm to 13.2 mm @ 40 Percent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.553	0.553	0.553	
		v) Pre-coated stone chips of 13.2 mm nominal size for skid resistance = $35 \times 0.005/10 = 0.018$	cum	0.018	0.018	0.018	
		vi) Bitumen for coating of chips @ 2 Percent by weight = $0.018 \times 1.456 \times 2/100 = 0.0005$ MT = 0.5kg	kg	0.510	0.510	0.510	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

d) Overhead charges	@ on	@ on	@ on
	(a+b+c)	(a+b+c)	(a+b+c)
e) Contractor's profit	@ on	@ on	@ on
	(a+b+c+d)	(a+b+c+d)	(a+b+c+d)

Cost for 35 Sqm = a+b+c+d+e

Rate per Sqm = (a+b+c+d+e)/35

- Note**
1. The rates for 50 mm & 40 mm thick layers may be worked out on pro-rata basis.
 2. Where tack coat is required to be provided before laying mastic asphalt, the same required to be measured and paid separately.
 3. The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.
 4. This rate analysis is based on design made by CRRRI for a specific case and is meant estimating purposes only. Actual design is required to be done for each case.

5.12 512

Slurry Seal

Providing and laying slurry seal consisting of a mixture of fine aggregates, Portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface

(i) 2-3 mm thickness (Type-I)

Unit = sqm

Taking output = 24000 sqm (60 cum)

Taking density of 2.2 tonnes per cum

a) Labour				
Mate	day	0.266	0.266	0.266
Mazdoor	day	6.650	6.650	6.650
b) Machinery				
Mechanical broom	hour	7.143	7.143	7.143
(2.1m sweeping width)				
Air compressor 250 cfm	hour	7.143	7.143	7.143
Mobile slurry seal equipment	hour	6.579	6.579	6.579
Front end loader				
(i) 3.1 Cum Capacity	hour	0.435		
(ii) 2.1 Cum Capacity	hour		0.645	
(iii) 1 Cum Capacity	hour			1.364
Tipper				
Tipper for loading time				
(i) 14 cum capacity	hour	0.435		
(ii) 14 cum capacity	hour		0.645	
(iii) 10 cum capacity	hour			1.364
For Transportation				
(i) 14 cum capacity	t.km	132 x L1		
(ii) 14 cum capacity	t.km		132 x L1	
(iii) 10 cum capacity	t.km			132 x L1

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper for unloading time					
		(i) 14 cum capacity	hour	6.579			
		(ii) 14 cum capacity	hour		6.579		
		(iii) 10 cum capacity	hour			6.579	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.167 x L1 + 3.200			
		(ii) 12 KL capacity	hour		0.222 x L1 + 4.267		
		(iii) 6 KL capacity	hour			0.444 x L1 + 8.533	
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	5.263	5.263	5.263	
		c) Material					
		Residual Binder @ 13 percent of mix = 60 x 2.2 x 0.13	tonne	17.160	17.160	17.160	
		Fine aggregate 3 mm and below 85.5 percent of total mix, 60x 2.2 x 0.855 = 112.860 tonnes. Taking density 1.5, = 112.860/1.5 = 75.240 cum	cum	75.240	75.240	75.240	
		Filler @ 1.5 percent of total mix = 60x 2.2 x 0.015	tonne	1.980	1.980	1.980	
		Cost of water	KL	12.000	12.000	12.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 24000 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/24000					
5.12		(ii) 4-6 mm thickness (Type-II)					
		Unit = sqm					
		Taking output = 16000 sqm (80 cum)					
		a) Labour					
		Mate	day	0.319	0.319	0.319	
		Mazdoor	day	7.980	7.980	7.980	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Mechanical broom	hour	4.762	4.762	4.762	
		(2.1m sweeping width)					
		Air compressor 250 cfm	hour	4.762	4.762	4.762	
		Mobile slurry seal equipment	hour	4.386	4.386	4.386	
		Front end loader					
		(i) 3.1 Cum Capacity	hour	0.580			
		(ii) 2.1 Cum Capacity	hour		0.860		
		(iii) 1 Cum Capacity	hour			1.818	
		Tipper					
		Tipper for loading time					
		(i) 14 cum capacity	hour	0.580			
		(ii) 14 cum capacity	hour		0.860		
		(iii) 10 cum capacity	hour			1.818	
		For Transportation					
		(i) 14 cum capacity	t.km	176 x L1			
		(ii) 14 cum capacity	t.km		176 x L1		
		(iii) 10 cum capacity	t.km			176 x L1	
		Tipper for unloading time					
		(i) 14 cum capacity	hour	4.386			
		(ii) 14 cum capacity	hour		4.386		
		(iii) 10 cum capacity	hour			4.386	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.167 x L1 + 2.133			
		(ii) 12 KL capacity	hour		0.222 x L1 + 2.844		
		(iii) 6 KL capacity	hour			0.444 x L1 + 5.689	
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	3.509	3.509	3.509	
		c) Material					
		Residual Binder @ 10.5 percent of mix 80 x 2.2 x 0.105	tonne	18.480	18.480	18.480	
		Fine aggregate 4.75 mm and below 88 percent of total mix, 80 x 2.2 x 0.88 = 154.880 tonnes.	cum	103.253	103.253	103.253	
		Taking density 1.5, = 154.880/1.5 = 103.253 cum					
		Filler @ 1.5 percent of total mix = 80 x 2.2 x 0.015	tonne	2.640	2.640	2.640	
		Cost of water	KL	12.000	12.000	12.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 16000 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/16000					
5.12	(iii)	6-8 mm thickness (Type-III)					
		Unit = sqm					
		Taking output = 12000 sqm (84 cum)					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	9.310	9.310	9.310	
		b) Machinery					
		Mechanical broom	hour	3.571	3.571	3.571	
		(2.1m sweeping width)					
		Air compressor 250 cfm	hour	3.571	3.571	3.571	
		Mobile slurry seal equipment	hour	3.289	3.289	3.289	
		Front end loader					
		(i) 3.1 Cum Capacity	hour	0.609			
		(ii) 2.1 Cum Capacity	hour		0.903		
		(iii) 1 Cum Capacity	hour			1.909	
		Tipper					
		Tipper for loading time					
		(i) 14 cum capacity	hour	0.609			
		(ii) 14 cum capacity	hour		0.903		
		(iii) 10 cum capacity	hour			1.909	
		For Transportation					
		(i) 14 cum capacity	t.km	184.8 x L1			
		(ii) 14 cum capacity	t.km		79.2 x L1		
		(iii) 10 cum capacity	t.km			79.2 x L1	
		Tipper for unloading time					
		(i) 14 cum capacity	hour	3.289			
		(ii) 14 cum capacity	hour		3.289		
		(iii) 10 cum capacity	hour			3.289	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.167 x L1 + 1.600			
		(ii) 12 KL capacity	hour		0.222 x L1 + 2.133		
		(iii) 6 KL capacity	hour			0.444 x L1 + 4.267	
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	2.632	2.632	2.632	
		c) Material					
		Residual Binder @ 9 percent of mix, 84 x 2.2 x 0.09	tonne	16.632	16.632	16.632	
		Fine aggregate 2.36 mm and below, 89.5 percent of total mix, 84x	cum	110.264	110.264	110.264	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

2.2 x 0.895 = 165.396
tonnes. Taking density
1.5, = 165.396/1.5 =
110.264 cum

Filler @ 1.5 percent of tonne 2.772 2.772 2.772
total mix = 84 x 2.2 x
0.015

Cost of water KL 12.000 12.000 12.000

d) Overhead charges @ on @ on @ on
(a+b+c) (a+b+c) (a+b+c)

e) Contractor's profit @ on @ on @ on
(a+b+c+d) (a+b+c+d) (a+b+c+d)

Cost for 12000 Sqm = a+b+c+d+e

Rate per Sqm = (a+b+c+d+e)/ 12000

Note 1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately.

5.13

519

Recycling of Bituminous Pavement with Central Recycling Plant

Recycling pavement by cold milling of existing bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30 per cent of the required quantity, hauling and stock piling the reclaimed material near the central recycling plant after carrying out necessary checks and evaluation, adding fresh material including rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, all as specified in clause 519.

Unit = cum

5.13

A

(i) Using by Bituminous Macadam Grading –II

Unit = Cum

Taking output = 120 Cum

a) Labour

Mate day 0.372 0.372 0.372
Mazdoor day 5.320 5.320 5.320
Mazdoor skilled day 3.990 3.990 3.990

b) Machinery

Milling machine
Milling Machine With 2 hour 7.881
meter Drum Width

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Milling Machine With 1.3 meter Drum Width	hour		12.125		
		Milling Machine with 1.2 meter Drum Width	hour			13.136	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.667	0.667	0.667	
		Batch Type Hot Mix Plant					
		(i) HMP 200 TPH	hour	1.971			
		(ii) HMP 160 TPH	hour		2.464		
		(iii) HMP 120 TPH	hour			3.286	
		Mechanical broom (2.1m sweeping width)	hour	0.571	0.571	0.571	
		Air compressor 250 cfm	hour	0.571	0.571	0.571	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	1.971			
		(ii) Paver (240HP)	hour		2.464		
		(iii) Paver (174HP)	hour			3.286	
		Electric generator					
		(i) 500 KVA	hour	1.971			
		(ii) 400 KVA	hour		2.464		
		(iii) 250 KVA	hour			3.286	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.631			
		(ii) 2.1 Cum Capacity	hour		7.784		
		(iii) 1 Cum Capacity	hour			8.123	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	1.971			
		(ii) 14 cum capacity	hour		2.464		
		(iii) 10 cum capacity	hour			16.422	
		For Transportation of dismantle material Site to Plant					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading time					
		(i) 14 cum capacity	hour	7.881			
		(ii) 14 cum capacity	hour		12.125		
		(iii) 10 cum capacity	hour			13.136	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Smooth steel wheeled tandem roller for static and vibratory passes	hour	12.642	12.642	12.642	
		c) Material					
		A bitumen content is 3.3 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement. In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.033 = 1.639$	tonne	1.639	1.639	1.639	
		Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.033 = 6.376$	tonne	6.376	6.376	6.376	
		ii) Aggregate					
		Percentage of mix requiring fresh aggregates - 70 percent					
		Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne					
		Weight of fresh aggregate in the mix = $193.2 \times 0.967 = 186.824$ tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 124.550 cum.					
		*Grading I (40 mm nominal size)					
		37.5 - 25 mm 15 per cent	cum	18.683	18.683	18.683	
		25 - 10 mm 45 per cent	cum	56.048	56.048	56.048	
		10 - 5 mm 25 per cent	cum	31.138	31.138	31.138	
		5 mm and below 15 per cent	cum	18.683	18.683	18.683	
		Credit for milled material for use (70 Percent),		124.550	124.550	124.550	
		Considering 20 percent cost as salvage value of above average material rate of aggregate					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

* Any one of the alternative may be adopted as per approved design

(i) for Grading I (40 mm nominal size)

d) Overhead charges	@ on	@ on	@ on
	(a+b+c)	(a+b+c)	(a+b+c)
e) Contractor's profit	@ on	@ on	@ on
	(a+b+c+d)	(a+b+c+d)	(a+b+c+d)

Cost for 120 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/120

5.13	A	(ii) Using by Bituminous Macadam Grading –II					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	5.320	5.320	5.320	
		Mazdoor skilled	day	3.990	3.990	3.990	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	7.881			
		Milling Machine With 1.3 meter Drum Width	hour		12.125		
		Milling Machine with 1.2 meter Drum Width	hour			13.136	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.667	0.667	0.667	
		Batch Type Hot Mix Plant					
		(i) HMP 200 TPH	hour	1.971			
		(ii) HMP 160 TPH	hour		2.464		
		(iii) HMP 120 TPH	hour			3.286	
		Mechanical broom (2.1m sweeping width)	hour	0.571	0.571	0.571	
		Air compressor 250 cfm	hour	0.571	0.571	0.571	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	1.971			
		(ii) Paver (240HP)	hour		2.464		
		(iii) Paver (174HP)	hour			3.286	
		Electric generator					
		(i) 500 KVA	hour	1.971			
		(ii) 400 KVA	hour		2.464		
		(iii) 250 KVA	hour			3.286	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.629			
		(ii) 2.1 Cum Capacity	hour		3.888		
		(iii) 1 Cum Capacity	hour			8.114	
		Tipper					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For Transportation					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	1.971			
		(ii) 14 cum capacity	hour		2.464		
		(iii) 10 cum capacity	hour			16.422	
		For Transportation of dismantle material Site to Plant					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading time					
		(i) 14 cum capacity	hour	7.881			
		(ii) 14 cum capacity	hour		12.125		
		(iii) 10 cum capacity	hour			13.136	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	12.642	12.642	12.642	
		c) Material					
		i) Bitumen					
		A bitumen content is 3.4 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.034 = 1.689$	tonne	1.689	1.639	1.639	
		Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.034 = 6.569$	tonne	6.569	6.376	6.376	
		ii) Aggregates					
		Percentage of mix requiring fresh aggregates - 70 per cent					
		Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Weight of fresh aggregate in the mix = 193.2 x 0.966 = 186.631 tonne Taking average density of 1.5 tonnes/cum, total volume of aggregate = 124.421 cum. Size wise requirement of fresh aggregates Grading II (19 mm nominal size) 25 - 10 mm 40 per cent cum 49.768 49.768 49.768 10 - 5 mm 40 per cent cum 49.768 49.768 49.768 5 mm and below 20 per cent cum 24.884 24.884 24.884 Credit for milled material for use (70 Percent), Considering 20 percent cost as salvage value of above average material rate of aggregate * Any one of the alternative may be adopted as per approved design		124.421	124.421	124.421	
		(i) for Grading I (40 mm nominal size)					
		d) Overhead charges		@ 10% on (a+b+c)	@ 12% on (a+b+c)	@ 15% on (a+b+c)	
		e) Contractor's profit		@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e Rate per cum = (a+b+c+d+e)/120					
		Note *1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula. 2. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor. 3. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and mazdoors for the same shall be deleted as the same has been included in the cost of tack coat.					
5.13	B	(i) Using by Dense Graded Bituminous Macadam Grading -I					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	5.320	5.320	5.320	
		Mazdoor skilled	day	3.990	3.990	3.990	
		b) Machinery					
		Milling machine					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Milling Machine With 2 meter Drum Width	hour	7.881			
		Milling Machine With 1.3 meter Drum Width	hour		12.125		
		Milling Machine with 1.2 meter Drum Width	hour			13.136	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.667	0.667	0.667	
		Batch Type Hot Mix Plant					
		(i) HMP 200 TPH	hour	1.971			
		(ii) HMP 160 TPH	hour		2.464		
		(iii) HMP 120 TPH	hour			3.286	
		Mechanical broom (2.1m sweeping width)	hour	0.571	0.571	0.571	
		Air compressor 250 cfm	hour	0.571	0.571	0.571	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	1.971			
		(ii) Paver (240HP)	hour		2.464		
		(iii) Paver (174HP)	hour			3.286	
		Electric generator					
		(i) 500 KVA	hour	1.971			
		(ii) 400 KVA	hour		2.464		
		(iii) 250 KVA	hour			3.286	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.560			
		(ii) 2.1 Cum Capacity	hour		3.787		
		(iii) 1 Cum Capacity	hour			7.903	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	1.971			
		(ii) 14 cum capacity	hour		2.464		
		(iii) 10 cum capacity	hour			16.422	
		For Transportation of dismantle material Site to Plant					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading time					
		(i) 14 cum capacity	hour	7.881			
		(ii) 14 cum capacity	hour		12.125		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity	hour				13.136
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	12.642	12.642		12.642
		c) Material					
		i) Bitumen					
		A bitumen content is 4.0 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.04 = 1.987$	tonne	1.987	1.987		1.987
		Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.04 = 7.728$	tonne	7.728	7.728		7.728
		ii) Aggregates					
		Percentage of mix requiring fresh aggregates - 70 per cent					
		Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne					
		Weight of fresh aggregate in the mix = $193.2 \times 0.96 = 185.472$ tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 123.648 cum.					
		Size wise requirement of fresh aggregates					
		*Grading I (40 mm nominal size)					
		37.5 - 25 mm 22 per cent	cum	27.203	27.203		27.203
		25 - 10 mm 13 per cent	cum	16.074	16.074		16.074
		10 - 4.75 mm 19 per cent	cum	23.493	23.493		23.493
		4.75 mm and below 44 per cent	cum	54.405	54.405		54.405

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Filler @ 2 per cent of weight of aggregates.	tonne	5.520	5.520	5.520	
		Credit for milled material for use (70 Percent), Considering 20 percent cost as salvage value of above average material rate of aggregate		123.648	123.648	123.648	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/120					
5.13	B	(ii) Using by Dense Graded Bituminous Macadam Grading -II					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	5.320	5.320	5.320	
		Mazdoor skilled	day	3.990	3.990	3.990	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	7.881			
		Milling Machine With 1.3 meter Drum Width	hour		12.125		
		Milling Machine with 1.2 meter Drum Width	hour			13.136	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.667	0.667	0.667	
		Batch Type Hot Mix Plant					
		(i) HMP 200 TPH	hour	1.971			
		(ii) HMP 160 TPH	hour		2.464		
		(iii) HMP 120 TPH	hour			3.286	
		Mechanical broom (2.1m sweeping width)	hour	0.571	0.571	0.571	
		Air compressor 250 cfm	hour	0.571	0.571	0.571	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	1.971			
		(ii) Paver (240HP)	hour		2.464		
		(iii) Paver (174HP)	hour			3.286	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Electric generator					
		(i) 500 KVA	hour	1.971			
		(ii) 400 KVA	hour		2.464		
		(iii) 250 KVA	hour			3.286	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.547			
		(ii) 2.1 Cum Capacity	hour		3.767		
		(iii) 1 Cum Capacity	hour			7.862	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	1.971			
		(ii) 14 cum capacity	hour		2.464		
		(iii) 10 cum capacity	hour			16.422	
		For Transportation of dismantle material Site to Plant					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading time					
		(i) 14 cum capacity	hour	7.881			
		(ii) 14 cum capacity	hour		12.125		
		(iii) 10 cum capacity	hour			13.136	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	12.642	12.642	12.642	
		c) Material					
		i) Bitumen					
		A bitumen content is 4.5 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.045 = 1.689$	tonne	2.236	2.236	2.236	
		Bitumen required for fresh mix of 193.2	tonne	8.694	8.694	8.694	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		tonnes = $193.2 \times 0.045 = 6.569$					
		ii) Aggregates					
		Percentage of mix requiring fresh aggregates - 70 per cent					
		Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne					
		Weight of fresh aggregate in the mix = $193.2 \times 0.955 = 184.506$ tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 123.004 cum.					
		Size wise requirement of fresh aggregates					
		Grading - II 19 mm (Nominal Size)					
		25 - 10 mm 30 per cent	cum	36.901	36.901	36.901	
		10 - 5 mm 28 per cent	cum	34.441	34.441	34.441	
		5 mm and below 40 per cent	cum	49.202	49.202	49.202	
		Filler @ 2 per cent of weight of aggregates.		5.520	5.520	5.520	
		Credit for milled material for use (70 Percent), Considering 20 percent cost as salvage value of above average material rate of aggregate		123.004	123.004	123.004	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/120					
5.13	C	(i) Using By Bituminous Concrete Grading-I					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	5.320	5.320	5.320	
		Mazdoor skilled	day	3.990	3.990	3.990	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	7.881			
		Milling Machine With 1.3 meter Drum Width	hour		12.125		
		Milling Machine with 1.2 meter Drum Width	hour			13.136	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.667	0.667	0.667	
		Batch Type Hot Mix Plant					
		(i) HMP 200 TPH	hour	1.971			
		(ii) HMP 160 TPH	hour		2.464		
		(iii) HMP 120 TPH	hour			3.286	
		Mechanical broom (2.1m sweeping width)	hour	0.571	0.571	0.571	
		Air compressor 250 cfm	hour	0.571	0.571	0.571	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	1.971			
		(ii) Paver (240HP)	hour		2.464		
		(iii) Paver (174HP)	hour			3.286	
		Electric generator					
		(i) 500 KVA	hour	1.971			
		(ii) 400 KVA	hour		2.464		
		(iii) 250 KVA	hour			3.286	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.528			
		(ii) 2.1 Cum Capacity	hour		3.739		
		(iii) 1 Cum Capacity	hour			7.804	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	1.971			
		(ii) 14 cum capacity	hour		2.464		
		(iii) 10 cum capacity	hour			16.422	
		For Transportation of dismantle material Site to Plant					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity	t.km			276 x L1	
		Tipper for loading time					
		(i) 14 cum capacity	hour	7.881			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		12.125		
		(iii) 10 cum capacity	hour			13.136	
		Smooth steel wheeled tandem roller for static and vibratory passes	hour	12.642	12.642	12.642	
		c) Material					
		i) Bitumen					
		A bitumen content is 5.2 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement. In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.052 = 2.583$	tonne	2.583	2.583	2.583	
		Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.052 = 10.046$	tonne	10.046	10.046	10.046	
		ii) Aggregates					
		Percentage of mix requiring fresh aggregates - 70 per cent					
		Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne					
		Weight of fresh aggregate in the mix = $193.2 \times 0.948 = 183.154$ tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 122.102 cum.					
		Size wise requirement of fresh aggregates					
		* Grading - I-19 mm (Nominal Size)					
		20 - 10 mm 38 per cent	cum	46.399	46.399	46.399	
		10 - 5 mm 17 per cent	cum	20.757	20.757	20.757	
		5 mm and below 43 per cent	cum	52.504	52.504	52.504	
		Filler @ 2 per cent of weight of aggregates.	cum	5.520	5.520	5.520	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Credit for milled material for use (70 Percent), Considering 20 percent cost as salvage value of above average material rate of aggregate * Any one of the alternative may be adopted as per approved design		122.102	122.102	122.102	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/120					
5.13	C	(ii) Using By Bituminous Concrete Grading-II					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	5.320	5.320	5.320	
		Mazdoor skilled	day	3.990	3.990	3.990	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	7.881			
		Milling Machine With 1.3 meter Drum Width	hour		12.125		
		Milling Machine with 1.2 meter Drum Width	hour			13.136	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.667	0.667	0.667	
		Batch Type Hot Mix Plant					
		(i) HMP 200 TPH	hour	1.971			
		(ii) HMP 160 TPH	hour		2.464		
		(iii) HMP 120 TPH	hour			3.286	
		Mechanical broom (2.1m sweeping width)	hour	0.571	0.571	0.571	
		Air compressor 250 cfm	hour	0.571	0.571	0.571	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	1.971			
		(ii) Paver (240HP)	hour		2.464		
		(iii) Paver (174HP)	hour			3.286	
		Electric generator					
		(i) 500 KVA	hour	1.971			
		(ii) 400 KVA	hour		2.464		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 250 KVA Front end loader for feeding the plant	hour				3.286
		(i) 3.1 Cum Capacity	hour	2.523			
		(ii) 2.1 Cum Capacity	hour		3.732		
		(iii) 1 Cum Capacity Tipper	hour				7.787
		For Transportation					
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity Tipper for loading & unloading time	t.km			276 x L1	
		(i) 14 cum capacity	hour	1.971			
		(ii) 14 cum capacity	hour		2.464		
		(iii) 10 cum capacity For Transportation of dismantle material Site to Plant	hour				16.422
		(i) 14 cum capacity	t.km	276 x L1			
		(ii) 14 cum capacity	t.km		276 x L1		
		(iii) 10 cum capacity Tipper for loading time	t.km			276 x L1	
		(i) 14 cum capacity	hour	7.881			
		(ii) 14 cum capacity	hour		12.125		
		(iii) 10 cum capacity	hour				13.136
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	12.642	12.642		12.642
		c) Material					
		i) Bitumen					
		A bitumen content is 5.4 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.054 =$	tonne	2.683	2.683		2.683
		2.683					
		Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.054 =$	tonne	10.433	10.433		10.433
		10.433					
		ii) Aggregates					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Percentage of mix requiring fresh aggregates - 70 per cent Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne Weight of fresh aggregate in the mix = $193.2 \times 0.946 = 182.767$ tonne Taking average density of 1.5 tonnes/cum, total volume of aggregate = 121.845 cum. Size wise requirement of fresh aggregates Grading - II-13 mm (Nominal Size) 13.2 - 10 mm 21 per cent 10 - 5 mm 17 per cent 5 mm and below 60 per cent Filler @ 2 per cent of weight of aggregates. Credit for milled material for use (70 Percent), Considering 20 percent cost as salvage value of above average material rate of aggregate * Any one of the alternative may be adopted as per approved design					
		13.2 - 10 mm 21 per cent	cum	25.587	25.587	25.587	
		10 - 5 mm 17 per cent	cum	20.714	20.714	20.714	
		5 mm and below 60 per cent	cum	73.107	73.107	73.107	
		Filler @ 2 per cent of weight of aggregates.	cum	5.520	5.520	5.520	
		Credit for milled material for use (70 Percent),		121.845	121.845	121.845	
		Considering 20 percent cost as salvage value of above average material rate of aggregate * Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e Rate per cum = $(a+b+c+d+e)/120$					
5.14	513	Fog Spray Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing. Unit = sqm Taking output = 10500 Sqm					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	3.125	3.125	3.125	
		Air compressor 250 cfm	hour	3.125	3.125	3.125	
		Bitumen pressure distributor (Spraying width 4.5 m)	tonne	2.917	2.917	2.917	
		c) Material					
		Bitumen emulsion @ 0.75 kg per sqm	tonne	7.880	7.880	7.880	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10500 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/10500					
		(ii) 1. In case it is decided by the engineer to blind the fog spray, the following may be added					
		a) Labour					
		Mate	day	0.213	0.160	0.160	
		Mazdoor for pre-coating of grit	day	5.320	4.000	4.000	
		b) Material					
		Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	26.250	26.250	
		Bitumen emulsion for pre-coating grit @ 2 Percent of grit, 39.38 x 0.02	tonne	0.790	0.790	0.790	
5.15	518	Bituminous Cold Mix (Including Gravel Emulsion) Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels. Unit = cum Taking output = 205 Cum					
		(i) Using bitumen emulsion and 9.5 mm or 13.2 mm size					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		aggregate					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Bitumen Emulsion 8 Percent					
		By weight of total mix					
		Filler 2 Percent					
		Total aggregates 90 Percent					
		Proportion of aggregates					
		19 mm to 9.5 mm 25 Percent					
		9.5 mm to 6 mm 29 Percent					
		6 mm to 0.075 mm 36 Percent					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor	day	9.310	9.310	9.310	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.214			
		(ii) HMP 160 TPH	hour		4.018		
		(iii) HMP 120 TPH	hour			5.357	
		Mechanical broom (2.1m sweeping width)	hour	1.743	1.743	1.743	
		Air compressor 250 cfm	hour	1.743	1.743	1.743	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.214			
		(ii) Paver (240HP)	hour		4.018		
		(iii) Paver (174HP)	hour			5.357	
		Electric generator					
		(i) 500 KVA	hour	3.214			
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.813			
		(ii) 2.1 Cum Capacity	hour		8.308		
		(iii) 1 Cum Capacity	hour			18.000	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L1			
		(ii) 14 cum capacity	t.km		450 x L1		
		(iii) 10 cum capacity	t.km			450 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.429			
		(ii) 14 cum capacity	hour		8.036		
		(iii) 10 cum capacity	hour			10.714	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	21.596	21.596	21.596	
		Pneumatic Tyre roller	hour	3.058	3.214	4.286	
	c) Material	Bitumen emulsion @ 8 Percent	tonne	36.000	36.000	36.000	
		Filler (lime)@ 2 Percent	tonne	9.000	9.000	9.000	
		Aggregates size 19 to 9.5 mm - 450 x 0.25 x 1/1.5	cum	75.000	75.000	75.000	
		Aggregates size 9.5 to 6 mm - 450 x 0.29 x 1/1.5	cum	87.000	87.000	87.000	
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	108.000	108.000	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					

(Applicable to cases I to IV)

- Note**
- Density of aggregates has been assumed 1.5 gms/cc
 - Tack coat where provided will be measured and paid separately.

5.15

(ii) Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate

Composition of mix (450 tonne) is assumed to be as under:-
 Bitumen Emulsion 8 Percent
 Filler 2 Percent
 Total aggregates 90 Percent
Proportion of aggregates
 37.5 mm to 19 mm 25 Percent
 19 mm to 6 mm 30 Percent
 6 mm to 0.075 mm 35 Percent

a) Labour

Mate	day	0.638	0.638	0.638
Mazdoor	day	9.310	9.310	9.310
Mazdoor skilled	day	6.650	6.650	6.650

b) Machinery

Hot Mix Plant

(i) HMP 200 TPH	hour	3.214		
(ii) HMP 160 TPH	hour		4.018	
(iii) HMP 120 TPH	hour			5.357
Mechanical broom (2.1m sweeping width)	hour	1.743	1.743	1.743

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Air compressor 250 cfm	hour	1.743	1.743	1.743	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.214			
		(ii) Paver (240HP)	hour		4.018		
		(iii) Paver (174HP)	hour			5.357	
		Electric generator					
		(i) 500 KVA	hour	3.214			
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.813			
		(ii) 2.1 Cum Capacity	hour		8.308		
		(iii) 1 Cum Capacity	hour			18.000	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L1			
		(ii) 14 cum capacity	t.km		450 x L1		
		(iii) 10 cum capacity	t.km			450 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.429			
		(ii) 14 cum capacity	hour		8.036		
		(iii) 10 cum capacity	hour			10.714	
		Smooth steel wheeled tandem roller for static and vibratory passages		21.596	21.596	21.596	
		Pneumatic Tyre roller	hour	3.058	3.214	4.286	
	c) Material						
		Bitumen emulsion @ 8 Percent	tonne	36.000	36.000	36.000	
		Filler (lime)@ 2 Percent	tonne	9.000	9.000	9.000	
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	75.000	75.000	
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	90.000	90.000	
		Aggregates size 6 to 0.075 mm - 450 x 0.35 x 1/1.5	cum	105.000	105.000	105.000	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					

- Note**
- Density of aggregates has been assumed 1.5 gms/cc
 - Tack coat where provided will be measured and paid separately.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.15	(iii)	<p>Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate</p> <p>Composition of mix (450 tonne) is assumed to be as under:-</p> <p>Cutback bitumen 5 Percent</p> <p>Filler (lime) 2 Percent</p> <p>Total aggregates 93 Percent</p> <p>Proportion of aggregates</p> <p>19 mm to 9.5 mm 26 Percent</p> <p>9.5 mm to 6 mm 31 Percent</p> <p>6 mm to 0.075 mm 36 Percent</p> <p>a) Labour</p> <p>Mate day 0.638 0.638 0.638</p> <p>Mazdoor day 9.310 9.310 9.310</p> <p>Mazdoor skilled day 6.650 6.650 6.650</p> <p>b) Machinery</p> <p>Hot Mix Plant</p> <p>(i) HMP 200 TPH hour 3.214</p> <p>(ii) HMP 160 TPH hour 4.018</p> <p>(iii) HMP 120 TPH hour 5.357</p> <p>Mechanical broom (2.1m sweeping width) hour 1.743 1.743 1.743</p> <p>Air compressor 250 cfm hour 1.743 1.743 1.743</p> <p>Paver finisher hydrostatic with sensor control compatible with the hot mix plant</p> <p>(i) Paver (240HP) hour 3.214</p> <p>(ii) Paver (240HP) hour 4.018</p> <p>(iii) Paver (174HP) hour 5.357</p> <p>Electric generator</p> <p>(i) 500 KVA hour 3.214</p> <p>(ii) 400 KVA hour 4.018</p> <p>(iii) 250 KVA hour 5.357</p> <p>Front end loader for feeding the plant</p> <p>(i) 3.1 Cum Capacity hour 6.000</p> <p>(ii) 2.1 Cum Capacity hour 8.585</p> <p>(iii) 1 Cum Capacity hour 18.581</p> <p>Tipper</p> <p>For Transportation</p> <p>(i) 14 cum capacity t.km 450 x L1</p> <p>(ii) 14 cum capacity t.km 450 x L1</p> <p>(iii) 10 cum capacity t.km 450 x L1</p> <p>Tipper for loading & unloading time</p> <p>(i) 14 cum capacity hour 6.429</p> <p>(ii) 14 cum capacity hour 8.036</p> <p>(iii) 10 cum capacity hour 10.714</p>					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	21.596	21.596	21.596	
		Pneumatic Tyre roller	hour	3.058	3.214	4.286	
	c) Material						
		Cutback bitumen @ 5 Percent	tonne	22.500	22.500	22.500	
		Filler (lime)@ 2 Percent	tonne	9.000	9.000	9.000	
		Aggregates size 19 to 9.5 mm - 450 x 0.26 x 1/1.5	cum	78.000	78.000	78.000	
		Aggregates size 9.5 to 6 mm - 450 x 0.31 x 1/1.5	cum	93.000	93.000	93.000	
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	108.000	108.000	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					

- Note**
1. Density of aggregates has been assumed 1.5 gms/cc
 2. Tack coat where provided will be measured and paid separately.

5.16

506

Sand Asphalt Base Course

Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing.

Unit = cum

Taking output = 205 Cum

a) Labour

Mate	day	0.638	0.638	0.638
Mazdoor	day	9.310	9.310	9.310
Mazdoor skilled	day	6.650	6.650	6.650

b) Machinery

Hot Mix Plant

(i) HMP 200 TPH	hour	3.214		
(ii) HMP 160 TPH	hour		4.018	
(iii) HMP 120 TPH	hour			5.357

Paver finisher hydrostatic with sensor control compatible with the hot mix plant

(i) Paver (240HP)	hour	3.214		
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CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) Paver (240HP)	hour		4.018		
		(iii) Paver (174HP)	hour			5.357	
		Electric generator					
		(i) 500 KVA	hour	3.214			
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.074			
		(ii) 2.1 Cum Capacity	hour		9.019		
		(iii) 1 Cum Capacity	hour			18.601	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L1			
		(ii) 14 cum capacity	t.km		450 x L1		
		(iii) 10 cum capacity	t.km			450 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.429			
		(ii) 14 cum capacity	hour		8.036		
		(iii) 10 cum capacity	hour			10.714	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	21.596	21.596	21.596	
		c) Material					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Density 2.20 tonne per cum					
		Weight 450 tonne					
		Bitumen 5 Percent					
		Filler 2 Percent					
		Sand of size 4.75 to 0.075 mm 93 Percent					
		Bitumen @ 5 Percent	tonne	22.500	22.500	22.500	
		Filler (lime) @ 2 Percent	tonne	9.000	9.000	9.000	
		Sand of size 4.75 to 0.075 mm - 450 x 0.93 x 1/1.5	cum	288.620	288.620	288.620	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					

Note 1. Tack coat will be measured and paid separately

5.17

- Crack Prevention Courses**
- (i) **Stress absorbing membrane (SAM) crack width less than 6 mm**

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with IRC:SP: 53, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902. Unit = sqm Taking output = 10500 sqm a) Labour Mate day 0.213 0.160 0.160 Mazdoor day 5.320 4.000 4.000 b) Machinery Mechanical broom (2.1m sweeping width) hour 3.125 3.125 3.125 Air compressor 250 cfm hour 3.125 3.125 3.125 Bitumen pressure distributor (Spraying width 4.5 m) hour 2.917 2.917 2.917 Hydraulic Chip spreader hour 5.397 5.397 5.397 Smooth wheeled road roller 8-10 tonne hour 5.397 5.397 5.397 c) Material Modified binder tonne 9.450 9.450 9.450 Crushed stone cum 105.000 105.000 105.000 aggregates 5.6 mm size d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d) Cost for 10500 Sqm = a+b+c+d+e Rate per Sqm = (a+b+c+d+e)/10500					
5.17	(ii)	Stress absorbing membrane (SAM) with crack width 6 mm to 9 mm Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with IRC:SP: 53, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902. Unit = sqm Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.213	0.160	0.160	
		Mazdoor	day	5.320	4.000	4.000	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	3.125	3.125	3.125	
		Air compressor 250 cfm	hour	3.125	3.125	3.125	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	2.917	2.917	2.917	
		Hydraulic Chip spreader	hour	5.397	5.397	5.397	
		Smooth wheeled road roller 8-10 tonne	hour	5.397	5.397	5.397	
		c) Material					
		Modified binder	tonne	11.550	11.550	11.550	
		Crushed stone chipping 11.2 mm size	cum	105.000	105.000	105.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10500 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/10500					

5.17

(iii) Stress absorbing membrane (SAM) crack width above 9 mm and cracked area above 50 Percent

Providing and laying a single coat of a stress absorbing membrane over a cracked road surface, with crack width above 9 mm and cracked area above 50 Percent after cleaning with a mechanical broom, using modified binder complying with IRC:SP: 53, sprayed at the rate of 15 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.

Unit = sqm

Taking output = 10500 sqm

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.319	0.266	0.266	
		Mazdoor	day	5.320	4.000	4.000	
		Mazdoor skilled	day	2.660	2.660	2.660	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	3.125	3.125	3.125	
		Air compressor 250 cfm	hour	3.125	3.125	3.125	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	2.917	2.917	2.917	
		Hydraulic Chip spreader	hour	5.397	5.397	5.397	
		Smooth wheeled road roller 8-10 tonne	hour	5.397	5.397	5.397	
		c) Material					
		Modified binder	tonne	15.750	15.750	15.750	
		Crushed stone aggregates 11.2 mm size	cum	126.000	126.000	126.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10500 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/10500					

Note In case 2nd coat is also required to be provided, material provided for the 2nd coat shall be as per Table 500-43.

5.17

- (iv) Case - IV : Bitumen impregnated geotextile**
 Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 518.3
Unit = sqm
Taking output = 3500 sqm
- | | | | | | | |
|--|------|-------|-------|-------|--|--|
| a) Labour | | | | | | |
| Mate | day | 0.372 | 0.372 | 0.372 | | |
| Mazdoor | day | 6.650 | 6.650 | 6.650 | | |
| Mazdoor skilled | day | 2.660 | 2.660 | 2.660 | | |
| b) Machinery | | | | | | |
| Mechanical broom (2.1m sweeping width) | hour | 1.042 | 1.042 | 1.042 | | |
| Air compressor 250 cfm | hour | 1.042 | 1.042 | 1.042 | | |
| Bitumen pressure distributor (Spraying width 4.5 m) | hour | 0.972 | 0.972 | 0.972 | | |

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic roller	hour	2.000	2.000	2.000	
		c) Material					
		Paving grade bitumen of 80 - 100 penetration @ 1.05 kg per sqm	tonne	3.680	3.680	3.680	
		Geotextile including 10 Percent for overlaps	sqm	3850.000	3850.000	3850.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 3500 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/3500					
5.18	518.3	Recipe Cold Mix					
		Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 518.3					
		Unit = cum					
		Taking output= 205 Cum					
	(i)	75 mm thickness					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor	day	9.310	9.310	9.310	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.214			
		(ii) HMP 160 TPH	hour		4.018		
		(iii) HMP 120 TPH	hour			5.357	
		Electric generator					
		(i) 500 KVA	hour	3.214			
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.457			
		(ii) 2.1 Cum Capacity	hour		9.581		
		(iii) 1 Cum Capacity	hour			19.800	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L1			
		(ii) 14 cum capacity	t.km		450 x L1		
		(iii) 10 cum capacity	t.km			450 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	6.429			
		(ii) 14 cum capacity	hour		8.036		

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity Paver finisher hydrostatic with sensor control compatible with the hot mix plant	hour				10.714
		(i) Paver (240HP)	hour	3.214			
		(ii) Paver (240HP)	hour		4.018		
		(iii) Paver (174HP)	hour				5.357
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	14.085	14.085		14.085
		Pneumatic Tyre roller	hour	2.571	3.214		4.286
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.083 x L1 + 0.182			
		(ii) 12 KL capacity	hour		0.111 x L1 + 0.243		
		(iii) 6 KL capacity	hour			0.222 x L1 + 0.486	
		c) Material					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	20.250	20.250	
		Crushed stone aggregates 40 mm nominal size	cum	297.000	297.000	297.000	
		Cost of water	KL	6.000	6.000	6.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					

Note (Case I to III)

- These mixes are considered suitable for minor repair work and temporary road surface improvement.
- In case concrete mixtures are required to be used for mixing, a number of these will be needed to match the capacity of road rollers.
- Tack coat, where provided, will be measured and paid separately.

5.18

(ii) 40 mm thickness

a) Labour

Mate	day	0.638	0.638	0.638
Mazdoor	day	9.310	9.310	9.310
Mazdoor skilled	day	6.650	6.650	6.650

b) Machinery

Hot Mix Plant

(i) HMP 200 TPH	hour	3.214		
(ii) HMP 160 TPH	hour		4.018	
(iii) HMP 120 TPH	hour			5.357

Electric generator

(i) 500 KVA	hour	3.214		
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CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.106			
		(ii) 2.1 Cum Capacity	hour		8.969		
		(iii) 1 Cum Capacity	hour			19.133	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L1			
		(ii) 14 cum capacity	t.km		450 x L1		
		(iii) 10 cum capacity	t.km			450 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	6.429			
		(ii) 14 cum capacity	hour		8.036		
		(iii) 10 cum capacity	hour			10.714	
		Paver finisher					
		hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.214			
		(ii) Paver (240HP)	hour		4.018		
		(iii) Paver (174HP)	hour			5.357	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	14.085	14.085	14.085	
		Pneumatic Tyre roller	hour	2.571	3.214	4.286	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.083 x L1 + 0.342			
		(ii) 12 KL capacity	hour		0.111 x L1 + 0.456		
		(iii) 6 KL capacity	hour			0.222 x L1 + 0.911	
		c) Material					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	31.500	31.500	
		Crushed stone aggregates 14 mm nominal size	cum	287.000	287.000	287.000	
		Cost of water	KL	6.000	6.000	6.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/205					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.18	(iii)	25 mm thickness					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor	day	9.310	9.310	9.310	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.214			
		(ii) HMP 160 TPH	hour		4.018		
		(iii) HMP 120 TPH	hour			5.357	
		Electric generator					
		(i) 500 KVA	hour	3.214			
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.510			
		(ii) 2.1 Cum Capacity	hour		8.182		
		(iii) 1 Cum Capacity	hour			16.875	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450 x L1			
		(ii) 14 cum capacity	t.km		450 x L1		
		(iii) 10 cum capacity	t.km			450 x L1	
		For loading & unloading time					
		(i) 14 cum capacity	hour	6.429			
		(ii) 14 cum capacity	hour		8.036		
		(iii) 10 cum capacity	hour			10.714	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.214			
		(ii) Paver (240HP)	hour		4.018		
		(iii) Paver (174HP)	hour			5.357	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	14.085	14.085	14.085	
		Pneumatic Tyre roller	hour	2.571	3.214	4.286	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.083 x L1 + 0.547			
		(ii) 12 KL capacity	hour		0.111 x L1 + 0.729		
		(iii) 6 KL capacity	hour			0.222 x L1 + 1.458	

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Material					
		Bitumen emulsion @ 85 litres per tonne	tonne	38.250	38.250	38.250	
		Crushed stone aggregates 6 mm nominal size	cum	270.000	270.000	270.000	
		Cost of water	KL	6.000	6.000	6.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 205 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 205					
5.19	suggestive	A	Bituminous Concrete				
		Grading 1 Using waste plastic					
		Providing and laying bituminous concrete with higher capacity batch type hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder @ 5.2 Percent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 507 complete in all respects					
		Unit = cum					
		Taking output = 191 cum					
		a) Labour					
		Mate	day	0.585	0.585	0.585	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	6.650	6.650	6.650	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.220			
		(ii) HMP 160 TPH	hour		4.025		
		(iii) HMP 120 TPH	hour			5.366	
		Mechanical broom (2.1m sweeping width)	hour	1.137	1.137	1.137	
		Air compressor 250 cfm	hour	1.137	1.137	1.137	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) Paver (240HP)	hour	3.220			
		(ii) Paver (240HP)	hour		4.025		
		(iii) Paver (174HP)	hour			5.366	
		Electric generator					
		(i) 500 KVA	hour	3.220			
		(ii) 400 KVA	hour		4.025		
		(iii) 250 KVA	hour			5.366	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	6.079			
		(ii) 2.1 Cum Capacity	hour		8.992		
		(iii) 1 Cum Capacity	hour			18.765	
		Tipper					
		For Transportation Mix					
		(i) 14 cum capacity	t.km	450.76 x L1			
		(ii) 14 cum capacity	t.km		450.76 x L1		
		(iii) 10 cum capacity	t.km			450.76 x L1	
		Loading & unloading time for Mix					
		(i) 14 cum capacity	hour	6.439			
		(ii) 14 cum capacity	hour		8.049		
		(iii) 10 cum capacity	hour			10.732	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	14.085	14.085	14.085	
		Pneumatic Tyre roller	hour	2.849	3.220	4.293	
		Shredding Machine	hour	1.250	1.250	1.250	
		c) Material					
		i) Bitumen@ 4.78 Percent of mix	tonne	21.564	21.564	21.564	
		ii) Plastic @ 8 Percent of Bitumen	tonne	1.875	1.875	1.875	
		iii) Aggregate					
		Total weight of mix =	450.760	tonnes			
		Weight of bitumen =	21.564	tonnes			
		Weight of Plastic =	1.875	tonnes			
		Weight of aggregate =	427.320	tonnes			
		Taking density of aggregate = 1.5 ton/cum					
		* Grading - I-19 mm (Nominal Size)					
		20 - 10 mm 38 percent	cum	108.255	108.255	108.255	
		10 - 5 mm 17 percent	cum	48.430	48.430	48.430	
		5 mm and below 43 percent	cum	122.499	122.499	122.499	
		Filler @ 2 percent of weight of aggregates.	cum	8.546	8.546	8.546	
		* Any one of the alternative may be adopted as per approved design					
		* Grading - I-19 mm (Nominal Size)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 191 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/191					

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.19	suggestive	B	Bituminous Concrete Grading 2 (Using waste plastic) Providing and laying bituminous concrete with higher capacity batch type hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 Percent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 507 complete in all respects Unit = cum Taking output = 191 cum a) Labour Mate				

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	450.76 x L1			
		(ii) 14 cum capacity	t.km		450.76 x L1		
		(iii) 10 cum capacity	t.km			450.76 x L1	
		Tipper for loading & unloading time					
		(i) 14 cum capacity	hour	6.439			
		(ii) 14 cum capacity	hour		8.049		
		(iii) 10 cum capacity	hour			10.732	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	20.121	20.121	20.121	
		Pneumatic Tyre roller	hour	2.849	3.220	4.293	
		Shredding Machine	hour	1.298	1.298	1.298	
		c) Material					
		i) Bitumen@ 4.97 Percent of mix	tonne	22.394	22.394	22.394	
		ii) Plastic @ 8 Percent of Bitumen	tonne	1.947	1.947	1.947	
		iii) Aggregate					
		Total weight of mix =	450.76	tonnes			
		Weight of bitumen =	22.39	tonnes			
		Weight of Plastic =	1.95	tonnes			
		Weight of aggregate =	426.42	tonnes			
		Taking density of aggregate = 1.5 ton/cum					
		Grading - II-13 mm (Nominal Size)					
		13.2 - 10 mm 21 percent	cum	59.825	99.498	99.498	
		10 - 5 mm 17 percent	cum	48.430	48.430	48.430	
		5 mm and below 60 percent	cum	170.928	170.928	170.928	
		Filler @ 2 percent of weight of aggregates.	cum	8.528	8.528	8.528	
		* Any one of the alternative may be adopted as per approved design					
		* Grading - I-19 mm (Nominal Size)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 191 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/191					

- Note**
- *1. Quantity of Bitumen & Plastic have been taken for analysis purpose. The actual will depend upon job mix formula.
 2. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.
 3. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors
 4. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e. excluding the weight of bitumen. The weight of filler will also be 2 Percent by weight of dry aggregates.

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.20	519	A	Hot Recycling in place of Bituminous Pavement with bituminous concrete Grading I Providing and laying bituminous concrete with Hot Recycling in place using crushed aggregates of specified grading, with bituminous binder @ 5.2 per cent of mix and filler, transporting the aggregate to work site, laying with a hot Recycling in place to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 519 complete in all respects. Unit = cum Taking output = 191 cum a) Labour Mate day 0.692 0.692 0.692 Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction day 10.640 10.640 10.640 Skilled mazdoor for checking line & levels day 6.650 6.650 6.650 b) Machinery Hot in place recycling with Pre heater unit for hot in place recycling hour 7.980 7.980 7.980 Front end loader for feeding the plant (i) 3.1 Cum Capacity hour 1.596 (ii) 2.1 Cum Capacity hour 1.596 (iii) 1 Cum Capacity hour 1.596 Tipper For Transportation (Mix 20 % fresh material has been considered) (i) 18 cum capacity t.km 90.152 x L1 (ii) 14 cum capacity t.km 90.152 x L1 (iii) 10 cum capacity t.km 90.152 x L1 Smooth steel wheeled tandem roller for static and vibratory passaes hour 14.085 14.085 14.085 Pnumetic Tyre roller hour 6.384 6.384 6.384 c) Material				

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)	
				Large	Medium	Small		
		i) Bitumen@ 5.2 per cent of weight of mix (for 80% recycled material @ 1.5%)	tonne	10.088	10.088	10.088		
		ii) Aggregate						
		Total weight of mix =	450.760	tonnes				
		Weight of bitumen =	23.440	tonnes				
		Weight of aggregate =	427.320	tonnes				
		Taking density of aggregate =1.5 ton/cum						
		* Grading - I-19 mm (Nominal Size) (only 20 % fresh material has been considered)						
		20 - 10 mm 38 per cent	cum	21.651	108.255	108.255		
		10 - 5 mm 17 per cent	cum	9.686	48.430	48.430		
		5 mm and below 43 per cent	cum	24.500	122.499	122.499		
		Filler @ 2 per cent of weight of aggregates.	cum	1.709	8.546	8.546		
		* Any one of the alternative may be adopted as per approved design						
		* Grading - I-19 mm (Nominal Size)						
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		Cost for 191 cum = a+b+c+d+e						
		Rate per cum = (a+b+c+d+e)/191						
5.20	519	B	Hot Recycling in place of Bituminous Pavement with bituminous concrete					
		Grading II						
		Providing and laying bituminous concrete with Hot Recycling in place using crushed aggregates of specified grading, with bituminous binder @ 5.4 per cent of mix and filler, transporting the aggregate to work site, laying with a hot Recycling in place to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 519 complete in all respects.						
		Unit = cum						
		Taking output = 191 cum						
		a) Labour						
		Mate	day	0.692	0.692	0.692		

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	10.640	10.640	10.640	
		Skilled mazdoor for checking line & levels	day	6.650	6.650	6.650	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	7.980	7.980	7.980	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	1.596			
		(ii) 2.1 Cum Capacity	hour		1.596		
		(iii) 1 Cum Capacity	hour			1.596	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	90.152 x L1			
		(ii) 14 cum capacity	t.km		90.152 x L1		
		(iii) 10 cum capacity	t.km			90.152 x L1	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	14.085	14.085	14.085	
		Pneumatic Tyre roller	hour	6.384	6.384	6.384	
		c) Material					
		i) Bitumen@ 5.4 per cent of weight of mix (for 80% recycled material @ 1.5%)	tonne	10.268	10.268	10.268	
		ii) Aggregate					
		Total weight of mix =	450.76	tonnes			
		Weight of bitumen =	24.341	tonnes			
		Weight of aggregate =	426.419	tonnes			
		Taking density of aggregate = 1.5 ton/cum					
		Grading - II-13 mm (Nominal Size)					
		(only 20 % fresh material has been considered)					
		13.2 - 10 mm 21 per cent	cum	21.704	59.825	59.825	
		10 - 5 mm 17 per cent	cum	9.710	48.430	48.430	
		5 mm and below 60 per cent	cum	24.560	170.928	170.928	
		Filler @ 2 per cent of weight of aggregates.	cum	1.713	8.546	8.546	
		* Any one of the alternative may be adopted as per approved design					
		* Grading - I-19 mm (Nominal Size)					
		d) Overhead charges		@ 10% on (a+b+c)	@ 12% on (a+b+c)	@ 15% on (a+b+c)	

CHAPTER: 5- BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

e) Contractor's profit	@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)
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Cost for 191 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/191

- Note**
- *1. Quantity of Bitumen & Plastic have been taken for analysis purpose. The actual quantity will depend upon job mix formula.
 2. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.
 3. The average density of 1.5 tonne/cum is only a reference density in this Data Book.
 4. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e. excluding the weight of bitumen. The weight of filler will also be 2 percent by weight of dry aggregates.

CHAPTER – 6

CEMENT CONCRETE PAVEMENT

PREAMBLES:

- 1 High capacity of batch mix plants of 240 cum/hour & 120 cum/hour have been considered in the rate analysis of cement concrete pavement works.
- 2 While tippers have been provided for transportation of dry lean cement concrete and rolled cement concrete, transit truck mixers have been considered for the cement concrete pavement.
- 3 Chemical admixture and Silica Fumes has been considered to improve workability with reduced water cement ratio.
- 4 OPC 43 & 53 grade, Portland Slag Cement and Portland Pozzolana Cement has been catered for the cement concrete pavement i.e, for pavement quality concrete to get higher strength. However, for dry lean concrete, cement of OPC 43 grade, Portland Slag Cement and Portland Pozzolana Cement.
- 5 While a slip form paver has been considered for pavement quality concrete, mechanical paver has been provided for dry lean and rolled cement concrete. However for smaller length construction by fixed form paver is an alternative.
- 6 The letter 'L1' (Lead from Mixing Plant to working site) represents lead in km one way. This will vary from project to project and is required to be ascertained at site to provide for the cost of carriage of the mix to work site.
- 7 Materials provided in the rate analysis are for estimating purpose. Exact quantity of materials will be determined for the job mix formula.
- 8 Fiber reinforcement concrete is also considered as specified in Clause 602.2.5 of MoRT&H Specification.
- 9 Rate of Ultra Thin White Topping analyzed.

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																																																	
				Large	Medium	Small																																																																		
6.01	601	<p>Dry Lean Cement Concrete Sub-base</p> <p>Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.</p> <p>Unit = cum</p> <p>Taking output= 450 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.479</td><td>0.479</td><td>0.479</td></tr><tr><td>Mazdoor skilled</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr><tr><td>Mazdoor</td><td>day</td><td>9.310</td><td>9.310</td><td>9.310</td></tr></table> <p>b) Machinery</p> <p>Paver with electronic sensor</p> <table><tr><td>(i) Paver Finisher Concrete with 300 HP Motor</td><td>hour</td><td>2.045</td><td></td><td></td></tr><tr><td>(ii) Paver Finisher Concrete with 241 HP Motor</td><td></td><td></td><td>3.000</td><td></td></tr><tr><td>(iii) Paver Finisher Concrete with 118 HP Motor</td><td></td><td></td><td></td><td>5.625</td></tr></table> <p>Vibratory roller 8-10 t capacity</p> <table><tr><td></td><td>hour</td><td>2.045</td><td>3.000</td><td>5.625</td></tr></table> <p>Tipper</p> <p>For Transportation</p> <table><tr><td>(i) 14 cum capacity</td><td>t.km</td><td>990 x L1</td><td></td><td></td></tr><tr><td>(ii) 14 cum capacity</td><td>t.km</td><td></td><td>990 x L1</td><td></td></tr><tr><td>(iii) 10 cum capacity</td><td>t.km</td><td></td><td></td><td>990 x L1</td></tr></table> <p>For loading & unloading Time</p> <table><tr><td>(i) 14 cum capacity</td><td>hour</td><td>4.724</td><td></td><td></td></tr><tr><td>(ii) 14 cum capacity</td><td>hour</td><td></td><td>5.679</td><td></td></tr><tr><td>(iii) 10 cum capacity</td><td>hour</td><td></td><td></td><td>10.982</td></tr></table> <p>Water tanker (speed @ 10 km/hr. and return speed@ 15 km/hr. and spreading speed @ 3.0 Km/hr.)</p>	Mate	day	0.479	0.479	0.479	Mazdoor skilled	day	2.660	2.660	2.660	Mazdoor	day	9.310	9.310	9.310	(i) Paver Finisher Concrete with 300 HP Motor	hour	2.045			(ii) Paver Finisher Concrete with 241 HP Motor			3.000		(iii) Paver Finisher Concrete with 118 HP Motor				5.625		hour	2.045	3.000	5.625	(i) 14 cum capacity	t.km	990 x L1			(ii) 14 cum capacity	t.km		990 x L1		(iii) 10 cum capacity	t.km			990 x L1	(i) 14 cum capacity	hour	4.724			(ii) 14 cum capacity	hour		5.679		(iii) 10 cum capacity	hour			10.982					
Mate	day	0.479	0.479	0.479																																																																				
Mazdoor skilled	day	2.660	2.660	2.660																																																																				
Mazdoor	day	9.310	9.310	9.310																																																																				
(i) Paver Finisher Concrete with 300 HP Motor	hour	2.045																																																																						
(ii) Paver Finisher Concrete with 241 HP Motor			3.000																																																																					
(iii) Paver Finisher Concrete with 118 HP Motor				5.625																																																																				
	hour	2.045	3.000	5.625																																																																				
(i) 14 cum capacity	t.km	990 x L1																																																																						
(ii) 14 cum capacity	t.km		990 x L1																																																																					
(iii) 10 cum capacity	t.km			990 x L1																																																																				
(i) 14 cum capacity	hour	4.724																																																																						
(ii) 14 cum capacity	hour		5.679																																																																					
(iii) 10 cum capacity	hour			10.982																																																																				

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	3.019 x L1 + 7.245			
		(ii) 12 KL capacity	hour		4.025 x L1 + 9.66		
		(iii) 6 KL capacity	hour			8.05 x L1 + 19.32	
		c) Material					
		Concrete from sub-analysis of concrete Rate					
		(i) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.18 A)	cum	450.000			
		(ii) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.18 A)	cum		450.000		
		(iii) Using Batching Plant 120 Cum Capacity (Rate taken from sub-analysis of concrete - 21.18 C)	cum			450.000	
		Cost of water (Curing)	KL	217.350	217.350	217.350	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/450					

Note Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.

6.02

602

Cement Concrete Pavement

Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with approve grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing					
		Unit = cum					
		Taking output = 900 Cum					
		a) Labour					
		Mate	day	0.585	0.585	0.585	
		Mazdoor skilled	day	6.650	6.650	6.650	
		Mazdoor	day	7.980	7.980	7.980	
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	0.893	0.893	0.893	
		Air compressor 250 cfm	hour	0.893	0.893	0.893	
		Paver with electronic sensor					
		(i) Paver Finisher Concrete with 300 HP Motor	hour	4.091			
		(ii) Paver Finisher Concrete with 241 HP Motor			6.000		
		(iii) Paver Finisher Concrete with 118 HP Motor				11.250	
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.km	2070 x L1	2070 x L1	2070 x L1	
		For Unloading time	hour	4.091	6.000	11.250	
		Concrete joint cutting machine	hour	101.587	101.587	101.587	
		Texturing machine					
		Texturing machine (TCM) - upto 18 m	hour	4.091			
		Texturing machine (TCM) - upto 18 m			6.000		
		Texturing machine (TCM) - upto 9 m				11.250	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	6.563 x L1 + 15.75			
		(ii) 12 KL capacity	hour		8.75 x L1 + 21		
		(iii) 6 KL capacity	hour			17.5 x L1 + 42	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c) Material							
Concrete from sub-analysis of concrete Rate							
(i) Using Batching Plant 240 Cum Capacity							
		(Rate taken from sub-analysis of concrete - 21.19 A)	cum	900.000			
(ii) Using Batching Plant 240 Cum Capacity							
		(Rate taken from sub-analysis of concrete - 21.19 A)	cum		900.000		
(iii) Using Batching Plant 120 Cum Capacity							
		(Rate taken from sub-analysis of concrete - 21.19 C)	cum			900.000	
		36 mm mild steel dowel bars of grade S 240	tonne	9.170	9.170	9.170	
		12 mm deformed steel tie bars of grade S 415	tonne	1.051	1.051	1.051	
		Separation Membrane of impermeable plastic sheeting 125 micron thick (including 5% Overlap)	sqm	3150.000	3150.000	3150.000	
		Joint sealant	kg	609.524	609.524	609.524	
		Sealant primer	kg	100.003	100.003	100.003	
		Plastic sheath,1.25 mm thick for dowel bars	sqm	155.735	155.735	155.735	
		Curing compound	Liter	600.000	600.000	600.000	
		Cost of water (Curing)	KL	472.500	472.500	472.500	
Add 1 Percent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipment's like scabbling machine, threads, ropes, guide wires and any other unforeseen items.							
d) Overhead charges				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Cost for 900 cum = a+b+c+d+e							
Rate per cum = (a+b+c+d+e)/900							

Note The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)														
				Large	Medium	Small															
6.03	Suggestive	<p>Transition Section between Rigid and Flexible Pavement</p> <p>Due to change in the properties of materials and type of construction, a gradual changeover from rigid pavement to flexible pavement is desirable to avoid any damage at the butting joint. After provision of an expansion joint in the cement concrete slab, the thickness of slab should be tapered to 10 cm over a length of 3 m towards the flexible pavement. The deficiency of thickness caused due to tapering of the slab should be made up by the asphaltic layers.</p> <p>The quantities of items should be worked out based on the approved design and drawings and priced as per rates given under respective clauses for cement concrete and asphaltic work.</p>																			
6.04	Suggestive	<p>Cement – Fly ash Dry Lean Cement Concrete Sub- base</p> <p>Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 20 Percent , aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 129 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.</p> <p>Unit = cum</p> <p>Taking output= 450 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.479</td><td>0.479</td><td>0.479</td></tr><tr><td>Mazdoor skilled</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr><tr><td>Mazdoor</td><td>day</td><td>9.310</td><td>9.310</td><td>9.310</td></tr></table>	Mate	day	0.479	0.479	0.479	Mazdoor skilled	day	2.660	2.660	2.660	Mazdoor	day	9.310	9.310	9.310				
Mate	day	0.479	0.479	0.479																	
Mazdoor skilled	day	2.660	2.660	2.660																	
Mazdoor	day	9.310	9.310	9.310																	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Paver with electronic sensor					
		(i) Paver Finisher Concrete with 300 HP Motor	hour	2.045			
		(ii) Paver Finisher Concrete with 241 HP Motor			3.000		
		(iii) Paver Finisher Concrete with 118 HP Motor				5.625	
		Vibratory roller 8-10 t capacity	hour	2.045	3.000	5.625	
		Tipper					
		For Transportation					
		(i) 14 cum capacity	t.km	990 x L1			
		(ii) 14 cum capacity	t.km		990 x L1		
		(iii) 10 cum capacity	t.km			990 x L1	
		For loading & unloading Time					
		(i) 14 cum capacity	hour	4.724			
		(ii) 14 cum capacity	hour		5.679		
		(iii) 10 cum capacity	hour			10.982	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	3.019 x L1 + 7.245			
		(ii) 12 KL capacity	hour		4.025 x L1 + 9.66		
		(iii) 6 KL capacity	hour			8.05 x L1 + 19.32	
		c) Material					
		Concrete from sub-analysis of concrete Rate					
		(i) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.18 B)	cum	450.000			
		(ii) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.18 B)	cum		450.000		
		(iii) Using Batching Plant 120 Cum Capacity (Rate taken from sub-analysis of concrete - 21.18 D)	cum			450.000	
		Cost of water (Curing)	KL	217.350	217.350	217.350	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

d) Overhead charges	@ on	@ on	@ on
	(a+b+c)	(a+b+c)	(a+b+c)
e) Contractor's profit	@ on	@ on	@ on
	(a+b+c+d)	(a+b+c+d)	(a+b+c+d)

Cost for 450 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/450

Note Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.

6.05 Suggestive

Cement – Fly ash Concrete Pavement.

Construction reinforced-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with approve grade cement @ 340 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 15 Percent and sand by 10 Percent, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing

Unit = cum

Taking output = 900 Cum

a) Labour

Mate	day	0.585	0.585	0.585
Mazdoor skilled	day	6.650	6.650	6.650
Mazdoor	day	7.980	7.980	7.980

b) Machinery

Mechanical broom @ 1250 sqm per hour	hour	0.893	0.893	0.893
Air compressor 250 cfm	hour	0.893	0.893	0.893

Paver with electronic sensor

(i) Paver Finisher Concrete with 300 HP Motor	hour	4.091		
(ii) Paver Finisher Concrete with 241 HP Motor			6.000	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) Paver Finisher Concrete with 118 HP Motor				11.250	
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.km	2070 x L1	2071 x L1	2072 x L1	
		For Unloading time	hour	4.091	6.000	11.250	
		Concrete joint cutting machine.	hour	101.587	101.587	101.587	
		Texturing machine.	hour	4.091	6.000	11.250	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	6.563 x L1 + 15.75			
		(ii) 12 KL capacity	hour		8.75 x L1 + 21		
		(iii) 6 KL capacity	hour			17.5 x L1 + 42	
		c) Material					
		Concrete from sub-analysis of concrete Rate					
		(i) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 B)	cum	900.000			
		(ii) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 B)	cum		900.000		
		(iii) Using Batching Plant 120 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 D)	cum			900.000	
		36 mm mild steel dowel bars of grade S 240	tonne	9.170	9.170	9.170	
		12 mm deformed steel tie bars of grade S 415	tonne	1.051	1.051	1.051	
		Separation Membrane of impermeable plastic sheeting 125 micron thick (including 5% Overlap)	sqm	3150.000	3150.000	3150.000	
		Joint sealant	kg	609.524	609.524	609.524	
		Sealant primer	kg	100.003	100.003	100.003	
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	155.735	155.735	155.735	
		Curing compound	Liter	600.000	600.000	600.000	
		Cost of water (Curing)	KL	472.500	472.500	472.500	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Add 1 Percent of material for cost of miscellaneous materials like tarpaulin, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipment's like scabbling machine, threads, ropes, guide wires and any other unforeseen items.

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 900 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/900

Note The quantities for cement, coarse aggregate and fine aggregates are for estimating only. The exact quantities will be as per mix design.

6.06 Suggestive

Thin White topping

Construction of thin white topping with plain cement concrete pavement over existing surface with approve grade cement @ 400 kg per cum and as per IRC SP-76, coarse and fine aggregate conforming to IS 383, maximum size of fine aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction joint, joint filler, sealant primer, joint sealant, admixtures as approved, curing compound, finishing to lines etc. and grades as per drawing .

Unit = cum

Taking output = 450 Cum

a) Labour

Mate	day	0.585	0.585	0.585
Mazdoor skilled	day	6.650	6.650	6.650
Mazdoor	day	7.980	7.980	7.980

b) Machinery

Mechanical broom @ 1250 sqm per hour	hour	0.893	0.893	0.893
Air compressor 250 cfm	hour	0.893	0.893	0.893

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Paver with electronic sensor					
		(i) Paver Finisher Concrete with 300 HP Motor	hour	2.045			
		(ii) Paver Finisher Concrete with 241 HP Motor			3.000		
		(iii) Paver Finisher Concrete with 118 HP Motor				5.625	
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.km	2070 x L1	2070 x L1	2070 x L1	
		For Unloading time	hour	2.045	3.000	5.625	
		Concrete joint cutting machine	hour	320.000	320.000	320.000	
		Texturing machine					
		Texturing machine (TCM) - upto 18 m	hour	2.045			
		Texturing machine (TCM) - upto 18 m			3.000		
		Texturing machine (TCM) - upto 9 m				5.625	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	3.281 x L1 + 7.875			
		(ii) 12 KL capacity	hour		4.375 x L1 + 10.5		
		(iii) 6 KL capacity	hour			8.75 x L1 + 21	
		c) Material					
		Concrete from sub-analysis of concrete Rate					
		(i) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 A)	cum	450.000			
		(ii) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 A)	cum		450.000		
		(iii) Using Batching Plant 120 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 C)	cum			450.000	
		Joint sealant	kg	1920.000	1920.000	1920.000	
		Sealant primer	kg	50.001	50.001	50.001	
		Fiber Reinforcement 9.25 kg Per Cum.	tonne	4.163	4.163	4.163	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Curing compound	Liter	600.000	600.000	600.000
Cost of water (Curing)	KL	236.250	236.250	236.250

Add 1 Percent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, cotton / compressible sponge and, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipments like scabbling machine, threads, ropes, guide wires and any other unforeseen items.

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 450 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/450

Note The quantities for cement, coarse aggregate and fine aggregates are for estimating only The exact quantities will be as per mix design.

6.07 Suggestive

Cement- - Fly ash Thin White topping

Construction of thin white topping with plain cement concrete pavement over existing surface with approve grade cement @ 340 kg per cum and Flyash as per IRC SP-76, coarse and fine aggregate conforming to IS 383, maximum size of fine aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction joint, joint filler, sealant primer, joint sealant, admixtures as approved, curing compound, finishing to lines etc. and grades as per drawing .

Unit = cum

Taking output = 450 Cum

a) Labour

Mate	day	0.585	0.585	0.585
Mazdoor skilled	day	6.650	6.650	6.650
Mazdoor	day	7.980	7.980	7.980

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	0.893	0.893	0.893	
		Air compressor 250 cfm	hour	0.893	0.893	0.893	
		Paver with electronic sensor					
		(i) Paver Finisher Concrete with 300 HP Motor	hour	2.045			
		(ii) Paver Finisher Concrete with 241 HP Motor			3.000		
		(iii) Paver Finisher Concrete with 118 HP Motor				5.625	
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.km	2070 x L1	2070 x L1	2070 x L1	
		For Unloading time	hour	2.045	3.000	5.625	
		Concrete joint cutting machine	hour	320.000	320.000	320.000	
		Texturing machine					
		Texturing machine (TCM) - upto 18 m	hour	2.045			
		Texturing machine (TCM) - upto 18 m			3.000		
		Texturing machine (TCM) - upto 9 m				5.625	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	3.281 x L1 + 7.875			
		(ii) 12 KL capacity	hour		4.375 x L1 + 10.5		
		(iii) 6 KL capacity	hour			8.75 x L1 + 21	
		c) Material					
		Concrete from sub-analysis of concrete Rate					
		(i) Using Batching Plant 240 Cum Capacity (Rate taken from sub-analysis of concrete - 21.19 B)	cum	450.000			
		(ii) Using Batching Plant 240 Cum Capacity(Rate taken from sub-analysis of concrete - 21.19 B)	cum		450.000		
		(iii) Using Batching Plant 120 Cum Capacity(Rate taken from sub-analysis of concrete - 21.19 D)	cum			450.000	

CHAPTER: 6- CEMENT CONCRETE PAVEMENTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Joint sealant	kg	1920.000	1920.000	1920.000	
		Sealant primer	kg	50.001	50.001	50.001	
		Fiber Reinforcement @ 9.25 kg Per Cum.	tonne	4.163	4.163	4.163	
		Curing compound	Liter	600.000	600.000	600.000	
		Cost of water (Curing)	KL	236.250	236.250	236.250	
		Add 1 Percent of material for cost of miscellaneous materials like tarpaulin, Hessian cloth, cotton / compressible sponge and, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipment's like scabbling machine, threads, ropes, guide wires and any other unforeseen items.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/450					

Note The quantities for cement, coarse aggregate and fine aggregates are for estimating only The exact quantities will be as per mix design.

CHAPTER – 7

GEOSYNTHETIC, REINFORCED EARTH AND PROTECTION WORKS

PREAMBLES:

- 1 The specifications for geo-synthetics which includes geotextiles, geogrids, geo-nets, geomembranes, geo-composites, geo-cells, geo-synthetic-map, natural geotextiles and Paving Fabric and Glass Grids shall be as per section 700 of MoRT&H Specifications.
- 2 The geotextile proposed for sub-surface drain shall satisfy the requirements given in Clause 702.2.3.1
- 3 Bitumen overlay shall follow on the same day where paving fabric is laid.
- 4 Rates are including quality control and testing.

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
7.01	702	Sub-Surface Drain with Geotextiles Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702.2.3 formed in to a stable network and a planar geo composite structure, joints wrapped with geotextile to prevent ingress of soil, all as per clause 702 and approved drawings including excavation and backfilling Unit = Running metre Taking output = one metre a) Labour Mate day 0.040 0.040 0.040 Mazdoor skilled day 0.333 0.333 0.333 Mazdoor day 0.665 0.665 0.665 b) Material Geo nets, geomembrane and geotextile to make planar geo composite stable network for sub surface drain including wrapping of joints with 160 mm over lapping with geotextile. Geo nets sqm 1.000 1.000 1.000 Geomembrane sqm 1.000 1.000 1.000 Geotextile sqm 2.000 2.000 2.000 Add 2 Percent cost of material for miscellaneous items like synthetic cord c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Rate per metre = a+b+c+d					
	Note	Surplus excavated material to be used at site. Hence separate cost for disposal not added.					
7.02	708	Laying Paving Fabric Beneath a Pavement Overlay Providing and laying paving fabric with physical requirements as per Table 700-16 over a tack coat of paving grade Bitumen 80-100 penetration, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling of tack coat, brooming and rolling of surface with pneumatic roller to maximise paving fabric contact with pavement surface					

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = sqm					
		Taking output = 2800 sqm					
		a) Labour					
		Mate	day	1.064	1.064	1.064	
		Mazdoor	day	26.600	26.600	26.600	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	0.833	2.240	2.240	
		Pneumatic roller 14 tonnes 2000 sqm per hour	hour	1.400	1.400	1.400	
		Bitumen pressure distributor (Spraying width 4.5 m)	hour	0.778	0.778	0.778	
		c) Material					
		Paving Fabric	sqm	2940.000	2940.000	2940.000	
		Paving Bitumen 80-100	tonne	2.800	2.800	2.800	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 2800 sqm = a+b+c+d+e					
		Rate per sqm =(a+b+c+d+e)/ 2800					
7.03	703	Laying Boulder Apron in Crates of Synthetic Geogrids Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 703.2, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per clause 703.3. filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines, all as per clause 703 and laid as per clause 2503.3 and approved design.					
		Unit = cum					
		Taking output = 3 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor skilled	day	0.665	0.665	0.665	
		Mazdoor	day	1.995	1.995	1.995	
		b) Material					
		Geo grids	sqm	21.000	21.000	21.000	
		Connectors/ Staples	each	50.000	50.000	50.000	
		Polymer braids	metre	20.000	20.000	20.000	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Stones with minimum size of 200 mm	cum	3.450	3.450	3.450	
		Stones spall for filling voids	cum	0.450	0.450	0.450	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 3 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 3					
7.04	3100	Reinforced Earth Structures					
		Reinforced earth Structures have four main components as under:					
		a) Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for facing elements (fascia material).					
		b) Fascia material and its placement.					
		c) Assembling, joining with facing elements and laying of the reinforcing elements.					
		d) Earth fill with granular material which is to be retained by the wall.					
		Each component is analysed separately as under:					
		considering Average height of wall = 8 m.					
7.04	3103	(i) Assembling, joining and laying of reinforcing elements.					
		A With reinforcing element of steel / Aluminium strips / polymeric strips.					
		Unit = Running Metre					
		Taking Output = 450 m					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor skilled	day	2.660	2.660	2.660	
		b) Material					
		@ Reinforcement strips 60 mm wide 5 mm thick as per clause 3103. including 5% wastage					
		1. Galvanised carbon steel strips	metre	472.500	472.500	472.500	
		Add 5 Percent of the cost of reinforcing elements strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps heat bonding or extension					
		or					

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		2.Copper Strips Add 5 Percent of the cost of reinforcing elements strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps heat bonding or extension or 3.Aluminium Strips Add 5 Percent of the cost of reinforcing elements strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps heat bonding or extension or 4.Stainless steel strips Add 5 Percent of the cost of reinforcing elements strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps heat bonding or extension or 5.Glass reinforced polymer/fiber reinforced polymer/polymeric strips Add 5 Percent of the cost of reinforcing elements strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps heat bonding or extension @ Any one of the above alternative may be adopted as per approved design.	metre	472.500	472.500	472.500	
			metre	472.500	472.500	472.500	
			metre	472.500	472.500	472.500	
			metre	472.500	472.500	472.500	
Type 1		1.Galvanised carbon steel strips c) Overhead charges d) Contractor's profit Cost of 450 m = a+b+c+d Rate per metre =(a+b+c+d)/ 450		@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
Type 2		2.Copper Strips c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost of 450 m = a+b+c+d					
		Rate per metre =(a+b+c+d)/ 450					
	Type 3	3.Aluminium Strips					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost of 450 m = a+b+c+d					
		Rate per metre =(a+b+c+d)/450					
	Type 4	4.Stainless steel strips					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost of 450 m = a+b+c+d					
		Rate per metre =(a+b+c+d)/ 450					
	Type 5	5.Glass reinforced polymer/fiber reinforced polymer/polymeric strips					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost of 450 m = a+b+c+d					
		Rate per metre =(a+b+c+d)/450					
7.04 (i)	B	With reinforcing elements of synthetic geogrids					
		Unit = sqm					
		Taking output= 300 sqm					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor skilled	day	2.660	2.660	2.660	
		b) Material					
		Synthetic Geogrids as per clause 3100 and approved design and specifications including 5% wastage.	sqm	315.000	315.000	315.000	
		Add 5 Percent of the cost of reinforcing elements (synthetic geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps and other protective elements for synthetic geogrids.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost of 300 sqm of Synthetic geogrids = a+b+c+d					
		Rate per sqm = (a+b+c+d)/ 300					
7.04	3105	(ii) Facing elements of RCC					
		Unit = sqm					
		Taking output= 200 sqm					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	7.980	7.980	7.980	
		Mazdoor skilled	day	2.660	2.660	2.660	
		b) Machinery					
		i) For Casting yard					
		Light crane with lifting capacity upto 3 tonne (For Lifting at casting yard)	hour	2.963	2.963	2.963	
		ii) For transportation and placement at site					
		Light crane with lifting capacity upto 3 tonne for loading & Unloading	hour	5.926	5.926	5.926	
		Trailer 30 tonne capacity for transporting to site	t.Km	36 x 2.5 x L	36 x 2.5 x L	36 x 2.5 x L	
		Light crane with lifting capacity upto 3 tonne (For erection)		8.000	8.000	8.000	
		c) Material					
		Pre-cast RCC M-35 facing elements of size as per design and 18 cm thick for 75 sqm. (Refer Item 12.08 (H) Case -II Basic Cost of Labour, Material & Machinery)	cu.m	36.000	36.000	36.000	
		Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		Non-Woven geotextile behind the fascia element to avoid leaching out of backfill material	Sqm	80.000	80.000	80.000	
		HYSD steel @ 7 kg / sqm (Refer Item 9.07,Basic Cost of Labour, Material & Machinery)	tonnes	1.400	1.400	1.400	
		Add 2 Percent of cost of fascia pannels, for all necessary temporary form work, scaffolding and provision of loops/lugs for lifting of panels and joining the reinforcing elements.					
		d) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		e) Contractor's profit		@ on (a+b+d)	@ on (a+b+d)	@ on (a+b+d)	
		Cost for 200 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/200					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

- Note**
- The specification and construction details to be adopted shall be as per section 3100 of MoRT&H Specification.
 - Drainage arrangement shall be made as per approved design and drawings.
 - The quantity of filler media shall be calculated as per approved design and specifications and shall be priced separately. The rate for same to be adopted from chapter 9.
 - Excavation for foundation including foundation concrete and groove in the foundation for seating of bottom most fascia panel and capping beam to be calculated as per design and priced separately. The rates for excavation and foundation concrete shall be taken from the chapter 3.
 - The earth fill to be retained is not included in this analysis. The same is to be worked out and provided separately complete as per clause 305.
 - For compaction of Earthwork, attention is invited to clause 3106.5 of MoRT&H Specification.
 - Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.
 - The type of reinforcing elements to be adopted shall be as per approved design and specifications.
 - The market rate for supply of reinforcing elements and their accessories are to be ascertained from reputed firms in the field of earth reinforcement.
 - The earth fill material shall be clean, free draining, granular with high friction and low cohesion, non-corrosive, coarse grained with not 10 Percent of particles passing 75 micron sieve, free of any deleterious matter, chlorides, salts, acids, alkalies, mineral oil, fungus and microbes and shall be of specified PH value.
 - Capping beam is to be priced separately as per approved design. The rate for cement concrete shall be taken from the chapter of sub-structure in bridge section.
 - The cost of reinforced earth retaining wall shall include following:
 - Foundation concrete as per approved design.
 - Cost of fascial panels and their erection .
 - Cost of reinforcing elements including their fixing and joining with the fascial panels.
 - Drainage arrangement including filter media as per approved design and drawings.
 - The compacted earth filling to be retained shall form part of embankment.
 - Excavation for foundation including backfilling paid separately.
 - The compacted earth filling to be retained shall form part of embankment/backfilling.

- 7.05 703 (i)** Supplying & laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORT&H specification for base/sub-base reinforcement having minimum tensile strength 15kN/m in the longitudinal and transverse direction, with 5kN/m and 7kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening.

Unit = Sqm

Taking output = 300 Sqm

a) Labour

Mate	day	0.266	0.266	0.266
Mazdoor	day	3.990	3.990	3.990
Mazdoor (Skilled)	day	2.660	2.660	2.660

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Bi-Axial Extruded Geo Grids of Minimum Tensile Strength 15 kN/m in the longitudinal and transverse direction	sqm	300.000	300.000	300.000	
		Add 10 % of the cost of reinforcing elements (synthetic geogrids) for wastage and accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps and other protective elements for synthetic geogrids and all other activities required to complete the item in all respect including taxes and transportation.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
7.05	703 (ii)	Supplying & laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORT&H specification for base/sub-base reinforcement having minimum tensile strength 20kN/m in the longitudinal and transverse direction, with 7kN/m and 14kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening. Unit = Sqm Taking output= 300 Sqm					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	2.660	2.660	2.660	
		b) Material					
		Bi-Axial Extruded GeoGrids of Minimum Tensile Strength 20 kN/m in the longitudinal and transverse direction	sqm	300.000	300.000	300.000	
		Add 10 % of the cost of reinforcing elements (synthetic geogrids) for wastage and accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps and other protective elements for synthetic geogrids					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		and all other activities required to complete the item in all respect including taxes and transportation.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
7.05	703 (iii)	Supplying & laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORT&H specification for base/sub-base reinforcement having minimum tensile strength 30kN/m in the longitudinal and transverse direction, with 10.5kN/m and 21kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening. Unit = Sqm Taking output = 300 Sqm a) Labour Mate day 0.266 0.266 0.266 Mazdoor day 3.990 3.990 3.990 Mazdoor (Skilled) day 2.660 2.660 2.660 b) Material Bi-Axial Extruded Geo Grids of Minimum Tensile Strength 30 kN/m in the longitudinal and transverse direction sqm 300.000 300.000 300.000 Add 10 % of the cost of reinforcing elements (synthetic geogrids) for wastage and accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps and other protective elements for synthetic geogrids and all other activities required to complete the item in all respect like transportation etc. c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																													
				Large	Medium	Small																														
7.05	703 (iv)	<p>Supplying & laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORT&H specification for base/sub-base reinforcement having minimum tensile strength 40kN/m in the longitudinal and transverse direction, with 14kN/m and 28kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening.</p> <p>Unit = Sqm</p> <p>Taking output = 300 Sqm</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.266</td><td>0.266</td><td>0.266</td></tr><tr><td>Mazdoor</td><td>day</td><td>3.990</td><td>3.990</td><td>3.990</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr></table> <p>b) Material</p> <table><tr><td>Bi-Axial Extruded Geo Grids of Minimum Tensile Strength 40 kN/m in the longitudinal and transverse direction</td><td>sqm</td><td>300.000</td><td>300.000</td><td>300.000</td></tr></table> <p>Add 10 % of the cost of reinforcing elements (synthetic geogrids) for wastage and accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps and other protective elements for synthetic geogrids and all other activities required to complete the item in all respect like transportation etc..</p> <table><tr><td>c) Overhead charges</td><td></td><td>@ on (a+b)</td><td>@ on (a+b)</td><td>@ on (a+b)</td></tr><tr><td>d) Contractor's profit</td><td></td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td></tr></table> <p>Cost for 300 sqm = a+b+c+d</p> <p>Rate per sqm = (a+b+c+d)/300</p>	Mate	day	0.266	0.266	0.266	Mazdoor	day	3.990	3.990	3.990	Mazdoor (Skilled)	day	2.660	2.660	2.660	Bi-Axial Extruded Geo Grids of Minimum Tensile Strength 40 kN/m in the longitudinal and transverse direction	sqm	300.000	300.000	300.000	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)				
Mate	day	0.266	0.266	0.266																																
Mazdoor	day	3.990	3.990	3.990																																
Mazdoor (Skilled)	day	2.660	2.660	2.660																																
Bi-Axial Extruded Geo Grids of Minimum Tensile Strength 40 kN/m in the longitudinal and transverse direction	sqm	300.000	300.000	300.000																																
c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)																																
d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																
7.06	703	<p>Supplying and laying high strength flexible geogrids (HSFG) as soil reinforcement / basal reinforcement as per MORTH 3100 and IRC 113, made of high tenacity polyester core with polyethylene coating with minimum Long Term Design Strength (LTDS) of more than 50% of ultimate tensile strength at 30 degree Celcius corresponding to 12 % strain etc. complete and as directed by Engineer - In - Charge.</p> <p>Unit = Sqm</p> <p>Taking output = 300 Sqm</p>																																		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		Mate	day	0.266	0.266	0.266	
		Beldar	day	3.990	3.990	3.990	
		Skilled Beldar	day	2.660	2.660	2.660	
		a) Material					
	(i)	Synthetic Geogrid Ultimate tensile strength- 100 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(ii)	Synthetic Geogrid Ultimate tensile strength- 150 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(iii)	Synthetic Geogrid Ultimate tensile strength- 200 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(iv)	Synthetic Geogrid Ultimate tensile strength- 250 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(v)	Synthetic Geogrid Ultimate tensile strength- 300 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(vi)	Synthetic Geogrid Ultimate tensile strength- 350 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(vii)	Synthetic Geogrid Ultimate tensile strength- 400 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(viii)	Synthetic Geogrid Ultimate tensile strength- 500 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(ix)	Synthetic Geogrid Ultimate tensile strength- 600 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(x)	Synthetic Geogrid Ultimate tensile strength- 800 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(xi)	Synthetic Geogrid Ultimate tensile strength- 900 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(xii)	Synthetic Geogrid Ultimate tensile strength- 1000 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(xiii)	Synthetic Geogrid Ultimate tensile strength- 1100 kN/m	sqm	300*1.1	300*1.1	300*1.1	
	(xiv)	Synthetic Geogrid Ultimate tensile strength- 1200 kN/m	sqm	300*1.1	300*1.1	300*1.1	
		@ Any one of the above alternative may be adopted as per approved design.					
		Add 10 Percent of the cost of reinforcing elements (synthetic geogrids) for wastage and accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia panels, overlaps and other protective elements for synthetic geogrids and all other activities required to complete the item in all respect like transportation etc.					
	(i)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(ii)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(iii)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(iv)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(v)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(vi)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(vii)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(viii)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300					
	(ix)	c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
(x)		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
(xi)		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
(xii)		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
(xiii)		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
(xiv)		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
7.07	704	Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. Geo composite for planar drainage, realized by thermos bonding a draining core in extruded monofilaments with two filtering nonwoven geotextiles that may also be working as separation or protecting layers. The draining three dimensional core will have a "W" configuration as					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																										
				Large	Medium	Small																											
		<p>longitudinal parallel channels. Minimum thickness to be 7.2mm, with two filtering UV stabilized polypropylene nonwoven geotextile of minimum thickness of 0.75 mm having pores of 150 micron and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geo composite having in plane flow capacity of 2.1 L / (m.s) at hydraulic gradient of 1.0 & 20 kpa pressure and tensile strength of 18 kN/m , with mass per unit area of 740 gsm, supplied in the form of roll for easy transportation to site of work as per detailed specification all complete as per directions of Engineer in charge.</p> <p>Unit = Sqm</p> <p>Taking output = 300 Sqm</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.266</td><td>0.266</td><td>0.266</td></tr><tr><td>Mazdoor</td><td>day</td><td>3.990</td><td>3.990</td><td>3.990</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr></table> <p>b) Material</p> <table><tr><td>Geo synthetic Drainage Composite</td><td>sqm</td><td>300.000</td><td>300.000</td><td>300.000</td></tr></table> <p>Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia panels, overlaps and other protective elements for synthetic Composites and other miscellaneous activities required to complete the item in all respect including transportation & takes.</p> <p>c) Overhead charges</p> <table><tr><td>@ on (a+b)</td><td>@ on (a+b)</td><td>@ on (a+b)</td></tr></table> <p>d) Contractor's profit</p> <table><tr><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td></tr></table> <p>Cost for 300 sqm = a+b+c+d</p> <p>Rate per sqm = (a+b+c+d)/300</p>	Mate	day	0.266	0.266	0.266	Mazdoor	day	3.990	3.990	3.990	Mazdoor (Skilled)	day	2.660	2.660	2.660	Geo synthetic Drainage Composite	sqm	300.000	300.000	300.000	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)					
Mate	day	0.266	0.266	0.266																													
Mazdoor	day	3.990	3.990	3.990																													
Mazdoor (Skilled)	day	2.660	2.660	2.660																													
Geo synthetic Drainage Composite	sqm	300.000	300.000	300.000																													
@ on (a+b)	@ on (a+b)	@ on (a+b)																															
@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																															
7.08	704	<p>Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. having thermobonding a draining core - HDPE geonet comprises of two sets of parallel overlaid ribs integrally connected to have a rhomboidal shape with a polyethylene film and a nonwoven geotextile having mass per unit area 130 g/m2 and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geocomposite having in plane flow capacity of 0.7 L / (m.s) at</p>																															

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		hydraulic gradient of 1.0 & 20 kPa pressure and tensile strength of 13.5 kN/ m , with mass per unit area of 830 gsm, at easily accessible location including top and bottom, with all leads and lifts, manpower and machinery, materials, labour etc. complete and as directed by Engineer - In - Charge. Unit = Sqm Taking output = 300 Sqm					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	2.660	2.660	2.660	
		b) Material					
		Geo synthetic Drainage Composite	sqm	300.000	300.000	300.000	
		Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia panels, overlaps and other protective elements for synthetic Composites and other miscellaneous activities required to complete the item in all respect including transportation & takes.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
7.09	Suggestive	Reinforced Cement Concrete Crash Barrier with friction Slab Provision of an Reinforced cement concrete crash barrier with friction slab at the approaches to bridge structures, constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:112 and as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified. (Area-0.185 Sqm. /Meter) below friction slab and (Area-1.032 Sqm. /Meter) Crash Barrier with friction Slab Unit = Linear meter Taking output = 10 m					

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(i)	a) M 40 grade concrete					
		PCC M 15 grade concrete (Area- 0.185 Sqm. /Meter) below friction slab	cum	0.550	0.550	0.550	
		(Rate taken from items 12.08 B Case-II including OH & CP)					
		RCC M 40 grade concrete (Area- 1.032 Sqm. /Meter)	cum	10.320	10.320	10.320	
		(Rate taken from items 14.01 E Case-II including OH & CP)					
		b) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		c) Material					
		Fiber Steel (80 Kg / Cum)	tonne	0.826	0.826	0.826	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	

Cost for 10 meter = a+b+c+d+e

Rate per meter = (a+b+c+d+e)/ 10

Note

- i) Excavation and backfilling are incidental to work and not to be measured separately.
- ii) Rate for PCC M 15 may be taken from chapter on 12.
- iii) Rate for RCC M 40 may be taken from chapter on 14.

7.10

In-Situ Soil reinforcement for slope restoration and protection work (Soil Nailing)

Supply and installation of In-Situ Soil reinforcement (Soil Nailing) with fully threaded hot-dip galvanized solid geotechnical bars as soil nails (galvanization minimum 500 grams per sqm) of minimum 25 mm diameter, having yield strength > 670N/mm² and tensile strength > 800N/mm² as per technical specifications and drawings etc. complete including drilling, flushing, grouting, and all Supply and installation of all components listed as per technical specifications and drawings etc. and considering all lead, lift and machinery .

Unit = Running meter

Taking output = 6 Running Meter

a) Labour

Mate	day	0.479	0.479	0.479
Skilled Mazdoor	day	1.330	1.330	1.330
Semi Skilled Mazdoor	day	2.660	2.660	2.660
Highly Skilled	day	5.320	5.320	5.320
Driller	day	1.330	1.330	1.330
Operator (Grouting)	day	1.330	1.330	1.330

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Air Compressor	hour	6.000	6.000	6.000	
		Tractor-trolley	hour	3.000	3.000	3.000	
		Grouting pump with agitator	hour	6.000	6.000	6.000	
		Drilling Machine	hour	6.000	6.000	6.000	
		c) Material					
		Fully Threaded Hot Dip galvanized geotechnical bars with casing'	LM	6.000	6.000	6.000	
		Centralizer	No.	3.000	3.000	3.000	
		Bearing Plate 200mm x 200mm x 10mm	No.	1.000	1.000	1.000	
		Spherical Dome Nut	No.	1.000	1.000	1.000	
		Cement	tonne	0.300	0.300	0.300	
		Admixture	Kg	1.000	1.000	1.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost of repair for 10m = a+b+c+d					
		Cost of meter = (a+b+c+d+e)/6					
7.11	suggestive	Horizontal Drainage Boring					
		Horizontal Drainage Boring methods on the types of Sandy Soil / Cohesive Soil and drilling length including cost of all materials, machinery, labour and all other ancillary operations etc. (Nominal Diameter of drilling pipe- 90 mm)					
		Nominal Diameter of drilling pipe- 90 mm.					
		Unit = Running Meter					
		(i) Drilling length below bed level upto 50.0 Meter					
		A Sandy Soil / Cohesive Soil					
		Taking output = 32 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	0.532	0.532	0.532	
		Mazdoor (Skilled)	day	0.468	0.468	0.468	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of					

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC) - 90 mm	meter	32.960	32.960	32.960	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	11.180	11.180	11.180	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 32 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 32					
B		Gravelly Soil					
		Taking output = 22 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.029	0.029	0.029	
		Mazdoor	day	0.399	0.399	0.399	
		Mazdoor (Skilled)	day	0.322	0.322	0.322	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of	hour	5.600	5.600	5.600	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		machinery and equipment)					
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Vinyl chloride pipes	meter	22.660	22.660	22.660	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	7.686	7.686	7.686	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 22 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 22					
		C Rubble/Cobble Stone					
		Taking output =16 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.004	0.004	0.004	
		Mazdoor	day	0.106	0.106	0.106	
		Mazdoor (Skilled)	day	0.000	0.000	0.000	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Vinyl chloride pipes	meter	0.000	0.000	0.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	0.000	0.000	0.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 16 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 16					
D		Soft Rock					
		Taking output = 20 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.027	0.027	0.027	
		Mazdoor	day	0.372	0.372	0.372	
		Mazdoor (Skilled)	day	0.293	0.293	0.293	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Vinyl chloride pipes	meter	20.600	20.600	20.600	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	6.988	6.988	6.988	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 20 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 20					
		(ii) Drilling length from 50.0 Meter - 80 meter					
		A Sandy Soil / Cohesive Soil					
		Taking output = 26.7 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.034	0.034	0.034	
		Mazdoor	day	0.462	0.462	0.462	
		Mazdoor (Skilled)	day	0.391	0.391	0.391	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)	meter	27.501	27.501	27.501	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	9.328	9.328	9.328	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 26.7 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 26.7					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
B Gravelly Soil							
Taking output = 18.3 Meter							
a) Labour							
For boring work							
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
For installation of pipe material							
		Mate	day	0.025	0.025	0.025	
		Mazdoor	day	0.350	0.465	0.465	
		Mazdoor (Skilled)	day	0.268	0.356	0.356	
For both installation and removal of machinery and equipment of boring works							
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
For installation and removal of temporary stage in flat terrain							
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
b) Machinery							
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
c) Materials							
		Vinyl chloride pipes	meter	18.849	18.849	18.849	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	6.394	6.394	6.394	
d) Overhead charges				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Cost for 18.3 meter = a+b+c+d+e							
Rate per meter = (a+b+c+d+e)/ 18.3							
C Rubble/Cobble Stone							
Taking output =13.3 Meter							
a) Labour							
For boring work							
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
For installation of pipe material							

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.019	0.019	0.019	
		Mazdoor	day	0.283	0.377	0.377	
		Mazdoor (Skilled)	day	0.195	0.259	0.259	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
	b)	Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
	c)	Materials					
		Vinyl chloride pipes	meter	13.699	13.699	13.699	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	4.647	4.647	4.647	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 13.3 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 13.3					
D		Soft Rock					
		Taking output = 16.7 Meter					
	a)	Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.023	0.023	0.023	
		Mazdoor	day	0.329	0.437	0.437	
		Mazdoor (Skilled)	day	0.244	0.325	0.325	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Vinyl chloride pipes	meter	17.201	17.201	17.201	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	5.835	5.835	5.835	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 16.7 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 16.7					
7.12	Suggestive	Horizontal Drainage Boring (Nominal Diameter of drilling pipe- 110 mm)					
		Horizontal Drainage Boring methods on the types of Sandy Soil / Cohesive Soil and drilling length including cost of all materials, machinery, labour and all other ancillary operations etc. (Nominal Diameter of drilling pipe- 90 mm)					
		Nominal Diameter of drilling pipe- 110 mm.					
		Unit = Running Meter					
	(i)	Drilling length below bed level upto 50.0 Meter					
	A	Sandy Soil / Cohesive Soil					
		Taking output =24 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.067	0.067	0.067	
		Mazdoor	day	1.330	1.330	1.330	
		Mazdoor (Skilled)	day	0.351	0.467	0.467	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
	b)	Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
	c)	Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	24.720	24.720	24.720	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	8.385	8.385	8.385	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 24 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 24					
B		Gravelly Soil					
		Taking output = 18 Meter					
	a)	Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.100	0.100	0.100	
		Mazdoor	day	1.170	1.557	1.557	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	18.540	18.540	18.540	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	6.289	6.289	6.289	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 18 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 18					
C		Rubble/Cobble Stone					
		Taking output =14 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.117	1.486	1.486	
		Mazdoor (Skilled)	day	0.205	0.272	0.272	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	14.420	14.420	14.420	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	4.891	4.891	4.891	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 14 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 14					
		D Soft Rock					
		Taking output = 17 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.056	0.056	0.056	
		Mazdoor	day	1.157	1.539	1.539	
		Mazdoor (Skilled)	day	0.249	0.331	0.331	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
	c)	Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	17.510	17.510	17.510	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	5.939	5.939	5.939	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 17 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 17					
	(ii)	Drilling length from 50.0 Meter - 80 meter					
	A	Sandy Soil / Cohesive Soil					
		Taking output =20 Meter					
	a)	Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.060	0.060	0.060	
		Mazdoor	day	1.197	1.592	1.592	
		Mazdoor (Skilled)	day	0.293	0.389	0.389	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
	b)	Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
	c)	Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	20.600	20.600	20.600	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	6.988	6.988	6.988	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 20.0 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 20					
B Gravelly Soil							
		Taking output = 15 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.054	0.054	0.054	
		Mazdoor	day	1.131	1.504	1.504	
		Mazdoor (Skilled)	day	0.219	0.292	0.292	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	15.450	15.450	15.450	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	5.241	5.241	5.241	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 15					
	C	Rubble/Cobble Stone					
		Taking output = 11.7 Meter					
	a)	Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.050	0.050	0.050	
		Mazdoor	day	1.087	1.445	1.445	
		Mazdoor (Skilled)	day	0.171	0.228	0.228	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
	b)	Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
	c)	Materials					
		Polyvinyl Chloride Pipe (PVC)-110 mm	meter	12.051	12.051	12.051	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	4.088	4.088	4.088	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 11.7 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 11.7					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

D Soft Rock

Taking output = 14.2 Meter

a) Labour

For boring work

Mate	day	0.213	0.213	0.213
Mazdoor	day	3.990	3.990	3.990
Mazdoor (Skilled)	day	1.330	1.330	1.330

For installation of pipe material

Mate	day	0.053	0.053	0.053
Mazdoor	day	1.120	1.489	1.489
Mazdoor (Skilled)	day	0.208	0.276	0.276

For both installation and removal of machinery and equipment of boring works

Mate	day	0.234	0.234	0.234
Mazdoor	day	3.458	3.458	3.458
Mazdoor (Skilled)	day	2.394	2.394	2.394

For installation and removal of temporary stage in flat terrain

Mate	day	0.484	0.484	0.484
Mazdoor	day	7.581	7.581	7.581
Mazdoor (Skilled)	day	4.522	4.522	4.522

b) Machinery

Boring Machine	hour	8.000	8.000	8.000
Grout Pump	hour	8.000	8.000	8.000
Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600
Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600

c) Materials

Polyvinyl Chloride Pipe (PVC)-110 mm	meter	14.626	14.626	14.626
Core tube (drilling bit)	Nos	0.416	0.416	0.416
Core tube (drilling pipe)	Nos	0.224	0.224	0.224
Core tube (Inner rod)	Nos.	0.288	0.288	0.288
Geo-textile for wrapping the pipe including 5% wastage	sqm	4.961	4.961	4.961

d) Overhead charges

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
--------------	--------------	--------------

e) Contractor's profit

@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
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Cost for 14.2 meter = a+b+c+d+e

Rate per meter = (a+b+c+d+e)/ 14.2

7.13 suggestive

Horizontal Drainage Boring (Nominal Diameter of drilling pipe- 135 mm)

Horizontal Drainage Boring methods on the types of Sandy Soil / Cohesive Soil and drilling length including cost of all materials, machinery, labour and all other ancillary operations etc.(Nominal

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Diameter of drilling pipe- 90 mm) Nominal Diameter of drilling pipe- 135 mm. Unit = Running Meter					
	(i)	Drilling length below bed level upto 50.0 Meter					
	A	Sandy Soil / Cohesive Soil					
		Taking output = 20 Meter					
	a)	Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.026	0.026	0.026	
		Mazdoor	day	0.359	0.478	0.478	
		Mazdoor (Skilled)	day	0.293	0.389	0.389	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
	b)	Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
	c)	Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	20.600	20.600	20.600	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	6.988	6.988	6.988	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 20 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 20					

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
B Gravelly Soil							
Taking output = 15 Meter							
a) Labour							
For boring work							
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
For installation of pipe material							
		Mate	day	0.020	0.020	0.020	
		Mazdoor	day	0.293	0.389	0.389	
		Mazdoor (Skilled)	day	0.219	0.292	0.292	
For both installation and removal of machinery and equipment of boring works							
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
For installation and removal of temporary stage in flat terrain							
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
b) Machinery							
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
c) Materials							
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	15.450	15.450	15.450	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	5.241	5.241	5.241	
d) Overhead charges				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Cost for 15 meter = a+b+c+d+e							
Rate per meter = (a+b+c+d+e)/ 15							
C Rubble/Cobble Stone							
Taking output = 13 Meter							
a) Labour							
For boring work							
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For installation of pipe material					
		Mate	day	0.018	0.018	0.018	
		Mazdoor	day	0.266	0.354	0.354	
		Mazdoor (Skilled)	day	0.190	0.253	0.253	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	13.390	13.390	13.390	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	4.542	4.542	4.542	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 13 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 13					
		D Soft Rock					
		Taking output = 15 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.020	0.020	0.020	
		Mazdoor	day	0.293	0.389	0.389	
		Mazdoor (Skilled)	day	0.219	0.292	0.292	

CHAPTER: 7- GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.234	0.234	0.234	
		Mazdoor	day	3.458	3.458	3.458	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	15.450	15.450	15.450	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	5.241	5.241	5.241	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 15					
		(ii) Drilling length from 50.0 Meter - 80 meter					
		A Sandy Soil / Cohesive Soil					
		Taking output = 16.7 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.022	0.022	0.022	
		Mazdoor	day	0.306	0.407	0.407	
		Mazdoor (Skilled)	day	0.244	0.325	0.325	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.245	0.245	0.245	
		Mazdoor	day	3.724	3.724	3.724	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	17.201	17.201	17.201	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	5.835	5.835	5.835	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 16.7 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 16.7					
B		Gravelly Soil					
		Taking output = 12.5 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.017	0.017	0.017	
		Mazdoor	day	0.250	0.333	0.333	
		Mazdoor (Skilled)	day	0.183	0.243	0.243	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.245	0.245	0.245	
		Mazdoor	day	3.724	3.724	3.724	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	12.875	12.875	12.875	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	4.367	4.367	4.367	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 12.5 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 12.5					
C		Rubble/Cobble Stone					
		Taking output = 10.8 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.015	0.015	0.015	
		Mazdoor	day	0.227	0.227	0.227	
		Mazdoor (Skilled)	day	0.158	0.158	0.158	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.245	0.245	0.245	
		Mazdoor	day	3.724	3.724	3.724	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for	hour	5.600	5.600	5.600	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		temporary stage)					
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	11.124	11.124	11.124	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	3.773	3.773	3.773	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10.8 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 10.8					
		D Soft Rock					
		Taking output = 12.5 Meter					
		a) Labour					
		For boring work					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		For installation of pipe material					
		Mate	day	0.017	0.017	0.017	
		Mazdoor	day	0.250	0.333	0.333	
		Mazdoor (Skilled)	day	0.183	0.183	0.183	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.245	0.245	0.245	
		Mazdoor	day	3.724	3.724	3.724	
		Mazdoor (Skilled)	day	2.394	2.394	2.394	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.484	0.484	0.484	
		Mazdoor	day	7.581	7.581	7.581	
		Mazdoor (Skilled)	day	4.522	4.522	4.522	
		b) Machinery					
		Boring Machine	hour	8.000	8.000	8.000	
		Grout Pump	hour	8.000	8.000	8.000	
		Crawler Crane- 5 tonne (for installation and removal of machinery and equipment)	hour	5.600	5.600	5.600	
		Crawler Crane- 5 tonne (for temporary stage)	hour	3.600	3.600	3.600	
		c) Materials					
		Polyvinyl Chloride Pipe (PVC)-135 mm	meter	12.875	12.875	12.875	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Core tube (Inner rod)	Nos.	0.288	0.288	0.288	
		Geo-textile for wrapping the pipe including 5% wastage	sqm	4.367	4.367	4.367	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 12.5 meter = a+b+c+d+e					
		Rate per meter = (a+b+c+d+e)/ 12.5					
7.14	710.1.4.of IRC:78 & 2200	Selected fill behind Reinforced Earth wall complete as per drawing and Technical Specification					
		A Granular material					
		Unit = cum					
		Taking output = 250 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor skilled	day	1.330	1.330	1.330	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	1.382			
		(ii) Motor grader 3.70 metre blade	hour		1.668		
		(iii) Motor grader 3.35 metre blade	hour			1.859	
		Vibratory roller	hour	1.445	1.445	1.445	
		Water tanker (speed @ Water tanker speedkm/hr and return speed @ 10 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.583 x L1 + 0.467			
		(ii) 12 KL capacity	hour		0.778 x L1 + 0.622		
		(iii) 6 KL capacity	hour			1.556 x L1 + 1.244	
		c) Material					
		Cost of water	KL	42.000	42.000	42.000	
		Granular material	cum	300.000	300.000	300.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 250 cum of granular backfill = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 250					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
7.14	B	Sandy material Unit = cum Taking output = 450 cum					
	a)	Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
	b)	Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.488			
		(ii) Motor grader 3.70 metre blade	hour		3.002		
		(iii) Motor grader 3.35 metre blade	hour			3.347	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.5 x L1 + 0.864			
		(ii) 12 KL capacity	hour		0.667 x L1 + 1.152		
		(iii) 6 KL capacity	hour			1.333 x L1 + 2.304	
		Vibratory roller	hour	2.601	2.601	2.601	
	c)	Material					
		Cost of water	KL	36.000	36.000	36.000	
		Sand at site	cum	450.000	450.000	450.000	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 450 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 450					
7.15	710.1.4.of IRC:78 and 2504.2	Providing and laying of Filter media with granular materials / stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification. Unit = cum Taking output = 10 cum.					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.000	12.000	12.000	
		c) Machinery					
		Water Tanker of 6 KL capacity	hour	0.060	0.060	0.060	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		cost for 10 cum of Filter Media = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 10					
7.16	704	Supplying & laying of drainage composite for use behind walls with Geo synthetic Drainage Composite					
7.16	A	Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. Geocomposite for drainage, realized by thermobonding a draining core in extruded monofilaments with two filtering nonwoven geotextiles that may also be working as separation or protecting layers. The draining three dimensional core will have a "W" configuration as longitudinal parallel channels. Minimum thickness to be 7.2mm, with two filtering UV stabilized polypropylene nonwoven geotextile of minimum thickness of 0.75 mm having pores of 150 micron and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geocomposite having in plane flow capacity of 2.1 L / (m.s) at hydraulic gradient of 1.0 & 20 kpa pressure and tensile strength of 18 kN/m , with mass per unit area of 740 gsm, supplied in the form of roll for easy transportation to site of work as per detailed specification all complete as per directions of Engineer in charge.					
		Unit = Sqm					
		Taking output = 300 Sqm					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	2.660	2.660	2.660	
		b) Material					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Geo synthetic Drainage Composite	sqm	300.000	300.000	300.000	
		Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia pannels, overlaps and other protective elements for synthetic Composites and other miscellaneous activities required to complete the item in all respect including transportation & takes.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/300					
7.16	B	Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. having thermos bonding a draining core - HDPE geo net comprises of two sets of parallel overlaid ribs integrally connected to have a rhomboidal shape with a polyethylene film and a nonwoven geotextile having mass per unit area 130 g/m ² and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geo composite having in plane flow capacity of 0.7 L / (m.s) at hydraulic gradient of 1.0 & 20 kPa pressure and tensile strength of 13.5 kN/ m , with mass per unit area of 830 gsm, at easily accessible location including top and bottom, with all leads and lifts, manpower and machinery, materials, labour etc. complete and as directed by Engineer - In - Charge.					
		Unit = Sqm					
		Taking output = 300 Sqm					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor (Skilled)	day	2.660	2.660	2.660	
		b) Material					
		Geo synthetic Drainage Composite	sqm	300.000	300.000	300.000	
		Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia panels, overlaps and other protective elements for synthetic Composites and other					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

miscellaneous activities required to complete the item in all respect including transportation & takes.

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Cost for 300 sqm = a+b+c+d

Rate per sqm = (a+b+c+d)/300

7.17 705

Geocell for Slope Protection

Furnishing and installing of the Geocell for Slope Protection including fixing and anchoring of cells in the ground ,preparation of ground, filling of cells with specified materials, seeding,watering and all other incidentals including all other items to complete the work as per these specifications drawing or as directed by the engineer.

Unit = sqm

Taking output = 100 sqm

a) Labour				
Mate	day	0.080	0.080	0.080
Mazdoor for preparation of ground and laying of the Geocell	day	1.500	1.500	1.500
Skilled Mazdoor		0.500	0.500	0.500
c) Material				
Geocell	Sqm	100.000	100.000	100.000
Add 10 per cent of the cost of Geocell for wastage, overlaps and accessories for anchoring with the ground, other protective elements for Geocell and other miscelleneus activities required to complete the item in all respect including transpotarion & takes.				
d) Overhead charges	@ 10% on (a+b+c)	@ 12% on (a+b+c)	@ 15% on (a+b+c)	
e) Contractor's profit	@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	

Cost for 100 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/100

Note For rate of soil filling, turfing/seeding, refer relevant chapter-03.

7.18 706

Geosynthetics mat on the slope

Furnishing and installing of the Geosynthetics mat for control of erosion of slopes including supplying and laying the mat, spreading soil and seeding to promote the design of vegetation, watering and all other

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		incidentals including all other items to complete the work as per these specifications drawing or as directed by the engineer .					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor for preparation of ground and laying of the Geocell	day	1.500	1.500	1.500	
		Skilled Mazdoor		0.500	0.500	0.500	
		c) Material					
		Geosynthetics mat	Sqm	100.000	100.000	100.000	
		Add 10 per cent of the cost of Geosynthetics mat for wastage, overlaps and accessories for anchoring with the ground, other protective elements for Geosynthetics mat and other miscelleneus activities required to complete the item in all respect including transpotarion & takes.					
		d) Overhead charges		@ 10% on (a+b+c)	@ 12% on (a+b+c)	@ 15% on (a+b+c)	
		e) Contractor's profit		@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	@ 10% on (a+b+c+d)	
		Cost for 100 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/100					

Note For rate of soil filling, turfing/seeding, refer relevant chapter-03.

7.19 707

Natural Geotextile on the slope

Furnishing and installing of the natural geotextile for control of erosion of slopes including supplying and laying the natural geotextile, spreading soil and seeding to promote the design of vegetation, watering and all other incidentals including all other items to complete the work as per these specifications drawing or as directed by the engineer .

Unit = sqm

Taking output = 100 sqm

a) Labour					
Mate	day	0.080	0.080	0.080	
Mazdoor for preparation of ground and laying of the Geocell	day	1.500	1.500	1.500	
Skilled Mazdoor		0.500	0.500	0.500	
c) Material					
Natural geotextile	Sqm	100.000	100.000	100.000	
Add 10 per cent of the cost of natural geotextile for wastage, overlaps and accessories for anchoring with the ground, other					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

protective elements for natural geotextile and other miscellaneous activities required to complete the item in all respect including transpotarion & takes.

d) Overhead charges	@ on	@ on	@ on
	(a+b+c)	(a+b+c)	(a+b+c)
e) Contractor's profit	@ on	@ on	@ on
	(a+b+c+d)	(a+b+c+d)	(a+b+c+d)

Cost for 100 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/100

Note:- For rate of soil filling, turfing/seeding, refer relevant chapter-03.

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PREAMBLES:

- 1 Rate analysis for fencing has been done for two different heights, i.e., 1.20 m and 1.80 m. Any of these two can be adopted depending upon a particular situation and design.
- 2 Rate analysis for fencing provides for three types as under :
 - a) Barbed wire fencing
 - b) Welded steel wire fabric with mesh size of 75 X 25 mm
 - c) Welded steel wire fabric with mesh size of 75 X 50 mm
- 3 Kerb stone laying and road marking has been provided for laying by mechanical means.
- 4 Back filling of foundation of boundary pillars has been proposed with stone spalls, tightly packed and compacted.
- 5 The item pertaining to road traffic signals has not been analyzed as this is a specialized work and rates can be obtained from firms having specialization for design and installation of this work.
- 6 For metal beam crash barrier, a 'W' shaped beam of size 311 X 83 mm flange width made with structural steel corrugated plate 3 mm thick and having a length of 4.5 m has been provided, over a channel post of 150 X 75 X 5 mm with a spacer of channel section 150 X 75 X 5 mm, 330 mm long.
- 7 Printing of letters and signs on item Nos. 18 to 21 is required to be measured and paid separately. A separate rate analysis for lettering has been prepared and included in this chapter for this purpose.
- 8 Two supports have been provided for direction and place identification signs where size is more than 0.9 sqm. Only one is provided for size upto 0.9 sqm.
- 9 The Traffic signs proposed are of retro-reflectorized type made of encapsulated lens type reflective sheeting fixed over Aluminium sheeting as per Clause 801.3 and installation.
- 10 The size, location of traffic signs shall be as per IRC:67.
- 11 The analyses for rigid, semi-rigid and flexible crash barriers have been included.
- 12 Provision has been made for a crane for installation of overhead signs.
- 13 Separate rate analysis has been made for Tubular steel railing with RCC posts and MS steel posts.
- 14 The organization and financial aspects are required to be finalized in consultation with administrative and traffic authorities.
- 15 The rate for the message display board for gantry mounted variable message sign is required to be ascertained from the market, this being a commercially produced item by specialized firms.
- 16 The rate analyses for traffic impact attenuators at abutments and piers have been included.
- 17 In the case of road signs and direction boards the depth of foundation and quantity of cement concrete provided in the rate analysis are indicative. These may be suitably increased in areas of higher wind velocities.
- 18 **Ducts for Utility Services Along and Across the Expressway/Highway :**

The running meter cost of duct along the road including inspection chambers (where applicable) or across the road depend upon the approved design. The various item involved are earthen work, plain cement

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concrete, brick stone masonry , reinforcement cement concrete, form work, steel reinforcement, laying of pipe line (where duct is of pipe) and cast iron/RCC cover for the inspection chamber. The rate for these items are available under respective clauses which can be applied and running meter cost of duct worked out as per the approved design and drawing for particular situations. In case cast iron cover for the inspection chamber, the rate can be ascertained from the market for the size provided in the design and approved drawings.

19 Noise Barriers :

Noise barrier can be provided in the form of a brick wall of a suitable height as per the site requirement and approved design. The items involved for the construction of this barrier like earthwork, brick masonry, plain cement concrete, etc. are available in the Data Book, which can be applied to arrive at the cost of noise barrier based on the design adopted.

Alternatively, wherever space permits, cluster of trees, shrubs and plants can be grown by the road side 6 m away from the edge of the roadway. This will intercept the annoying sound waves and fumes from road vehicles.

20 Items and rate analysis for ATMS, HTMS and Solar Road Studs has been included.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.01	409	Cast in Situ Cement Concrete M20 Kerb Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade on M-15 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 409 Unit = Running metre Taking output = 360 meter Using Concrete Batching and Mixing Plant					
		(i) PCC M15 for Kerb base					
		Total Concrete =	11.610	Cum.			
		a) Labour					
		Mate	day	0.319	0.319	0.319	
		Mason	day	2.660	2.660	2.660	
		Mazdoor	day	5.320	5.320	5.320	
		b) Machinery					
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.Km	26.703 x L1	26.703 x L1	26.703 x L1	
		For loading & Unloading time	hour	3.729	3.729	3.729	
		Water tanker (speed @Water tanker speed km /hr. and return speed @ 10 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.022 x L1 + 0.12			
		(ii) 12 KL capacity	hour		0.03 x L1 + 0.12		
		(iii) 6 KL capacity	hour			0.059 x L1 + 0.12	
		c) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.21)	cum	11.610	11.610	11.610	
		Cost of water	KL	1.602	1.602	1.602	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 meter = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/360					
		(ii) PCC M20 for Kerb Cast in Situ					
		Total Concrete = 12.600 Cum.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Kerb casting machine @ 120 metres/hour	hour	3.000	3.000	3.000	
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.Km	28.980 x L1	28.980 x L1	28.980 x L1	
		For loading & Unloading time	hour	3.140	3.140	3.140	
		Concrete cutting machine	hour	6.000	6.000	6.000	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 10 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.085 x L1 + 0.12			
		(ii) 12 KL capacity	hour		0.113 x L1 + 0.12		
		(iii) 6 KL capacity	hour			0.225 x L1 + 0.12	
		c) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.20)	cum	12.600	12.600	12.600	
		Cost of water	KL	6.086	6.086	6.086	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 360 meter = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/360					
8.02	409	Cast in Situ Cement Concrete M 20 Kerb with Channel					
		Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M15 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCCM20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 409					
		Unit = Running metre					
		Taking output = 300 meter					
		Total Concrete = 9.675 Cum.					
		Using Concrete Batching and Mixing Plant					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
(i) PCC M15 for Kerb base							
a) Labour							
		Mate	day	0.319	0.319	0.319	
		Mason	day	2.660	2.660	2.660	
		Mazdoor	day	5.320	5.320	5.320	
b) Machinery							
Transit truck agitator							
		For Transportation Transit truck agitator 6 cum capacity	t.Km	26.703 x L1	26.703 x L1	26.703 x L1	
		For loading & Unloading time	hour	3.108	3.108	3.108	
		Water tanker (speed @ Water tanker speed km/hr. and return speed @ 10 km/hr. and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.019 x L1 + 0.1			
		(ii) 12 KL capacity	hour		0.025 x L1 + 0.1		
		(iii) 6 KL capacity	hour			0.049 x L1 + 0.1	
c) Material							
		Per Cum Basic Cost (Rate taken from sub-analysis 21.20)	cum	9.675	9.675	9.675	
		Cost of water	KL	1.335	1.335	1.335	
d) Overhead charges							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit							
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Cost for 300 meter = a+b+c+d+e							
Rate per metre = (a+b+c+d+e)/300							
(ii) PCC M20 for Kerb Cast in Situ							
Total Concrete = 15.00 cum							
a) Labour							
		Mate	day	0.080	0.080	0.080	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	1.330	1.330	1.330	
b) Machinery							
		Kerb casting machine @ 90 metres/hour	hour	3.333	3.333	3.333	
Transit truck agitator							
		For Transportation Transit truck agitator 6 cum capacity	t.Km	28.980 x L1	28.980 x L1	28.980 x L1	
		For loading & Unloading time	hour	3.500	3.500	3.500	
		Concrete cutting machine	hour	5.000	5.000	5.000	
		Water tanker (speed @ Water tanker speed km/ hr. and return speed @ 10 km/hr. and spreading speed @ 3.0 Km/hr.)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.101 x L1 + 0.1			
		(ii) 12 KL capacity	hour		0.134 x L1 + 0.1		
		(iii) 6 KL capacity	hour			0.268 x L1 + 0.1	
		c) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.21)	cum	15.000	15.000	15.000	
		Cost of water	KL	7.245	7.245	7.245	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 300 meter = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/300					
8.03	801	Printing New Letter and Figures of any Shade					
		Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade					
		Hindi (Matrass, commas and the like not to be measured and paid for Half letter shall be counted as half)					
		Details for 100 letters of 16 cm height i.e. 1600 cm					
		Unit = per cm height per letter					
		Taking Output= 1600 cm					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Painter	day	2.660	2.660	2.660	
		Mazdoor	day	1.330	1.330	1.330	
		b) Material					
		Paint	Litre	0.700	0.700	0.700	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1600 cm = a+b+c+d					
		Rate per cm height per letter = (a+b+c+ d)/1600					
8.03		(ii) English and Roman					
		Hyphens and the like not to be measured and paid for					
		Detail for 100 letters of 16 cm height. i.e.1600 cm					
		Unit = per cm height per letter					
		Taking Output= 1600 cm					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.093	0.093	0.093	
		Painter Ist class	day	1.663	1.663	1.663	
		Mazdoor	day	0.665	0.665	0.665	
		b) Material					
		Paint	Litre	0.500	0.500	0.500	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1600 cm = a+b+c+d					
		Rate per cm height per letter = (a+b+c +d)/1600					
8.04	801	Retro-Reflectorised Traffic Signs					
	A	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of Class-B Type IV retro reflective sheeting fixed over 2 mm thick Aluminium sheeting vide clause 801.3, 3mm/4mm thick Aluminium composite material sheet depending on the size of the sign fixed over back support frame of min 25 x 25 x 3mm Angle mounted on a mild steel circular pipe 65 NB ,3.2 mm thickness firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing. The sign shall be maintained as per section 12 of IRC 67.					
		Unit = Each					
		Taking output = one traffic sign					
		i) Excavation for foundation (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	0.122	0.122	0.122	
		ii) Cement concrete M25 grade (Rate taken from item No. 9.06, E, Case-II including OH & CP)	cum	0.122	0.122	0.122	
		iii) Painting angle iron post two coats (Rate taken from item No. 8.09 including OH & CP)	sqm	1.414	1.414	1.414	
		a) Labour (For fixing at site)					
		Mate	day	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		b) Material					
		Mild Steel 'L' Angle Back Support Frame 25 x 25 x 3mm	kg	2.200	2.200	2.200	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mild Steel circular pipe 65 NB, 3.2 mm thickness, 3.6 meter height	kg	20.556	20.556	20.556	
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size including lettering and signs as applicable					
	(i)	120 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.624	0.624	0.624	
		or					
	(ii)	90 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.351	0.351	0.351	
		or					
	(iii)	75 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.244	0.244	0.244	
		or					
	(iv)	60 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.156	0.156	0.156	
		or					
	(v)	120 cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	1.131	1.131	1.131	
		or					
	(vi)	90 cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.636	0.636	0.636	
		or					
	(vii)	75cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.442	0.442	0.442	
		or					
	(viii)	60 cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.283	0.283	0.283	
		or					
	(ix)	90 cm x 75 cm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.675	0.675	0.675	
		or					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(x)	80 mm x 60 mm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.480	0.480	0.480	
	(xi)	60 cm x 50 cm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.300	0.300	0.300	
	(xii)	60 cm x 45 cm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.270	0.270	0.270	
	(xiii)	60 cm x 60 cm square Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.360	0.360	0.360	
	(xiv)	120 cm high octagon Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	1.193	1.193	1.193	
	(xv)	90 cm high octagon Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.671	0.671	0.671	
	(xvi)	75 cm high octagon Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.466	0.466	0.466	
	c) Machinery						
		Tractor-trolley	hour	0.010	0.010	0.010	
	(i) 120 cm equilateral triangle						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Rate per traffic sign = (i+ii+iii+a+b+c+d+e)						
	(ii) 90 cm equilateral triangle						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Rate per traffic sign = (i+ii+iii+a+b+c+d+e)						

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 75 cm equilateral triangle					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(iv) 60 cm equilateral triangle					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(v) 120 cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(vi) 90 cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(vii) 75cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(viii) 60 cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(ix) 90 cm x 75 cm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(x) 80 mm x 60 mm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(xi) 60 cm x 50 cm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xii) 60 cm x 45 cm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xiii) 60 cm x 60 cm square					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xiv) 120 cm high octagon					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xv) 90 cm high octagon					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xvi) 75 cm high octagon					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
8.04	801	B Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of Class-C Type XI retro reflective sheeting fixed over 2 mm thick Aluminium sheeting vide clause 801.3, 3mm/4mm thick Aluminium composite material sheet depending on the size of the sign fixed over back support frame of min 25 x 25 x 3mm					

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Angle mounted on a mild steel circular pipe 65 NB ,3.2 mm thickness firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing. The sign shall be maintained as per section 12 of IRC 67.					
		Unit = Each					
		Taking output = one traffic sign					
		i) Excavation for foundation (Rate taken from item No. 9.01 A (I) including OH & CP	cum	0.122	0.122	0.122	
		ii) Cement concrete M25 grade (Rate taken from item No. 9.06, E, Case-II including OH & CP)	cum	0.122	0.122	0.122	
		iii) Painting angle iron post two coats (Rate taken from item No. 8.09 including OH & CP)	sqm	1.414	1.414	1.414	
		a) Labour (For fixing at site)					
		Mate	day	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		b) aterial					
		Mild Steel 'L' Angle Back Support Frame 25 x 25 x 3mm	kg	2.200	2.200	2.200	
		Mild Steel circular pipe 65 NB ,3.2 mm thickness, 3.6 meter height	kg	20.556	20.556	20.556	
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size including lettering and signs as applicable					
	(i)	120 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.624	0.624	0.624	
		or					
	(ii)	90 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.351	0.351	0.351	
		or					
	(iii)	75 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.244	0.244	0.244	
		or					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(iv)	60 cm equilateral triangle Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.156	0.156	0.156	
	(v)	120 cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	1.131	1.131	1.131	
	(vi)	90 cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.636	0.636	0.636	
	(vii)	75cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.442	0.442	0.442	
	(viii)	60 cm circular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.283	0.283	0.283	
	(ix)	90 cm x 75 cm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.675	0.675	0.675	
	(x)	80 mm x 60 mm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.480	0.480	0.480	
	(xi)	60 cm x 50 cm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.300	0.300	0.300	
	(xii)	60 cm x 45 cm rectangular Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.270	0.270	0.270	
	(xiii)	60 cm x 60 cm square Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc. or	sqm	0.360	0.360	0.360	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(xiv)	120 cm high octagon Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	1.193	1.193	1.193	
		or					
	(xv)	90 cm high octagon Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.671	0.671	0.671	
		or					
	(xvi)	75 cm high octagon Add 1 Percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.466	0.466	0.466	
	c) Machinery						
		Tractor-trolley	hour	0.010	0.010	0.010	
	(i) 120 cm equilateral triangle						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
	(ii) 90 cm equilateral triangle						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
	(iii) 75 cm equilateral triangle						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
	(iv) 60 cm equilateral triangle						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
	(v) 120 cm circular						
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(vi) 90 cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(vii) 75cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(viii) 60 cm circular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(ix) 90 cm x 75 cm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(x) 80 mm x 60 mm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xi) 60 cm x 50 cm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xii) 60 cm x 45 cm rectangular					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
		(xiii) 60 cm x 60 cm square					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
(xiv)		120 cm high octagon					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
(xv)		90 cm high octagon					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
(xvi)		75 cm high octagon					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per traffic sign = (i+ii+iii+a+b+c+d+e)					
Note		1. Any one area of Aluminium sheeting given at (i) to (xvi) may be adopted as per site requirement and in accordance with IRC : 67 2. Rate for excavation, cement concrete M-25 and painting may be taken from respective chapters -09 & 08 respectively. 3. The depth of foundation and quantity of cement concrete in the foundation are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.					

8.05 801

**Direction and Place Identification
Signs upto 0.9 sqm Size Board.**

Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick or Aluminium composite material sheet with overall thickness of 4mm with area not exceeding 0.9 sqm fixed over back support frame of min 35 x 35 x 3mm Angle mounted on a mild steel circular pipe 65 NB, firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing

Unit = sqm

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Taking output = 0.9 sqm							
		i) Excavation for foundation (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	0.122	0.122	0.122	
		ii) Cement concrete M25 grade (Rate taken from item No. 9.06 E, Case-II including OH & CP)	cum	0.122	0.122	0.122	
		iii) Painting angle iron post two coats (Rate taken from items 8.09 A including OH & CP)	sqm	1.414	1.414	1.414	
		a) Labour (For fixing at site)					
		Mate	day	0.011	0.011	0.011	
		Mazdoor	day	0.266	0.266	0.266	
		b) Material					
		Mild Steel 'L' Angle Back Support Frame 35 x 35 x 3mm	kg	6.080	6.080	6.080	
		Mild Steel circular pipe 65 NB ,3.2 mm thickness, 3.6 meter height	kg	20.556	20.556	20.556	
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	0.900	0.900	
		Add 2 Percent of cost of materials for drilling holes, nuts, bolts, fabrication etc.					
		c) Machinery					
		Tractor-trolley	hour	0.020	0.020	0.020	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Cost for 0.9 sqm = I+ii+iii+ a+b+c+d+e

Rate per sqm (for sign having area upto 0.9 sqm) = (I+ii+iii+a+b+c+d+e)/0.90

- Note** 1) Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately.
2. Rate for excavation, cement concrete M-25 and painting may be taken from respective chapters -09 & 08 respectively.

8.06 801

**Direction and Place Identification
Signs with size more than 0.9 sqm
size Board.**

Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of High Intensity grade sheeting lause 801.3, fixed over aluminium sheeting, 2 mm thick or Aluminium composite material sheet with overall thickness

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

of 4 mm with area exceeding 0.9 sqm fixed over back support frame of min 40 x 40 x 5 mm MS Angle mounted on two nos. of mild steel circular pipe 65 NB ,3.2 mm thickness and 4.5 meter total height firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing

Unit = sqm

Taking output = 1.5 sqm

i) Excavation for foundation (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	0.243	0.243	0.243
ii) Cement concrete M25 grade (Rate taken from item No. 9.06 E, Case-II including OH & CP)	cum	0.243	0.243	0.243
iii) Painting angle iron post two coats (Rate taken from item No. 8.09 including OH & CP)	sqm	2.827	2.827	2.827
a) Labour (For fixing at site)				
Mate	day	0.016	0.016	0.016
Mazdoor	day	0.399	0.399	0.399
b) Material				
Mild Steel 'L' Angle Back Support Frame 40 x 40 x 5 mm	kg	14.400	14.400	14.400
Mild Steel circular pipe 65 NB ,3.2 mm thickness, 3.6 meter height	kg	41.112	41.112	41.112
Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	1.500	1.500
Add 2 Percent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				
c) Machinery				
Tractor-trolley	hour	0.020	0.020	0.020
d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 1.50 sqm = a+b+c+d+e

Rate per Sqm. = (a+b+c+d+e) /1.50

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.07	802	Overhead Signs Providing and erecting overhead signs with a corrosion resistant 2mm thick aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans & as per IRC :67					
		A Truss and Vertical Support Unit = tonne Taking output = 1 tonne					
		a) Labour					
		Mate	day	0.319	0.319	0.319	
		Blacksmith	day	2.660	2.660	2.660	
		Mazdoor including for handling & fixing at site.	day	5.320	5.320	5.320	
		b) Material					
		Aluminium alloy / galvanised steel including 2 Percent wastage	tonne	1.020	1.020	1.020	
		Add 1 Percent on cost of material for nuts, bolts and drilling and welding consumables					
		Add 15 Percent on cost of material for fabrication of trusses as per approved design					
		c) Machinery					
		Crane 3 tonne capacity	hour	3.000	3.000	3.000	
		Truck	hour	0.500	0.500	0.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per tonne = (a+b+c+d+e)					
8.07		B Aluminium Alloy Plate for Over Head Sign Unit = sqm Taking output = 1 sqm					
		a) Labour					
		Mate	day	0.013	0.013	0.013	
		Blacksmith	day	0.133	0.133	0.133	
		Mazdoor	day	0.200	0.200	0.200	
		b) Material					
		Aluminium alloy plate,2 mm thick, fixed with high intensity grade sheeting vide clause 801.3	sqm	1.000	1.000	1.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Miscellaneous

Add 1 Percent of cost of labour for lifting arrangement, like ladders, pulleys, ropes etc

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Rate per sqm = (a+b+c+d)

Note The cost of excavation and foundation concrete for fixing of vertical support system to be worked out separately as per the approved drawing/design and to be included in the estimate. Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been included separately in this chapter.

8.08 803

Painting Two Coats on New Concrete Surfaces

Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces

Unit = sqm

Taking output = 40 sqm

a) Labour

Mate	day	0.160	0.160	0.160
Painter	day	2.660	2.660	2.660
Mazdoor	day	1.330	1.330	1.330

b) Material

Paint conforming to requirement of clause 803.3.	Litre	6.000	6.000	6.000
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Add for scaffolding @ 1 Percent of labour cost where required

Add @ 5 Percent cost of labour and materials to prepare the surface by filling minuts roughness on the surface and priming the surface before laying 2 coats of painting.

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Cost for 40 sqm = a+b+c+d

Rate per sqm = (a+b+c+d)/40

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.09	803	<p>Painting on Steel Surfaces</p> <p>Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade</p> <p>Unit = sqm</p> <p>Taking output = 10 sqm</p> <p>a) Labour</p> <p>Mate </p>					

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
8.11	803	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work					
		Painting lines, dashes, arrows etc. on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control					
		(i) Over 10 cm in width					
		Unit = sqm					
		Taking output =10 sqm					
		a) Labour					
		Mate	day	0.112	0.112	0.112	
		Painter	day	0.732	0.732	0.732	
		Mazdoor	day	2.062	2.062	2.062	
		b) Material					
		Road marking Paint as per IS :164	Litre	1.480	1.480	1.480	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm= (a+b+c+d)/10					
8.11		(ii) Up to 10 cm in width					
		Unit = sqm					
		Taking output =10 sqm					
		a) Labour					
		Mate	day	0.073	0.073	0.073	
		Painter	day	0.466	0.466	0.466	
		Mazdoor	day	1.350	1.350	1.350	
		b) Material					
		Road marking paint	Litre	1.480	1.480	1.480	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
8.12	803	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work					
		Painting lines, dashes, arrows etc. on					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		roads in two coats on old work with ready mixed road marking paint conforming to IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control					
		(i) Over 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.082	0.082	0.082	
		Painter Ist class	day	0.399	0.399	0.399	
		Mazdoor	day	1.663	1.663	1.663	
		b) Material					
		Road marking paint	Litre	0.900	0.900	0.900	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
8.12		(ii) Up to 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.073	0.073	0.073	
		Painter Ist class	day	0.466	0.466	0.466	
		Mazdoor	day	1.350	1.350	1.350	
		b) Material					
		Road marking Paint	Litre	0.900	0.900	0.900	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm= a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
8.13	803	Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface					
		Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = sqm Taking output = 600 sqm					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	0.998	0.998	0.998	
		b) Machinery					
		Road marking machine @ 60 sqm per hour	hour	10.000	10.000	10.000	
		Tractor-trolley	hour	0.500	0.500	0.500	
		c) Material					
		Hot applied thermoplastic compound	Litre	1500.000	1500.000	1500.000	
		Reflectorising glass beads	kg	150.000	150.000	150.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 600 sqm = a+b+c+d+e					
		Rate per sqm = a+b+c+d+e/ 600					
Note							
	1.	A sealing primer may be applied in advance on cement concrete pavement to ensure proper bonding. Any laitance and/or curing compound to be removed where paint is required to be applied on concrete surface.					
	2.	Cost of painter is already included in hire charges of road marking machine.					
8.14	804	Kilometre Stone Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8, fixing in position including painting and printing etc					
		(i) 5th kilometre stone (precast)					
		Unit = Nos.					
		Taking output = 6 Nos.					
		a) M-15 grade of concrete (Rate taken from item No. 9.06, A, Case-II including OH & CP)	cum	2.350	2.350	2.350	
		b) Steel reinforcement @ 5 kg per sqm (Rate taken from items 9.07)/1000 including OH & CP)	kg	22.080	22.080	22.080	
		c) Excavation in soil for foundation (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	1.680	1.680	1.680	
		d) Painting two coats on concrete surface (Rate taken from item No. 8.08 including OH & CP)	sqm	9.850	9.850	9.850	
		e) Lettering on km post (average 30 letters of 10 cm height each) (Rate taken	per cm per letter	1800.000	1800.000	1800.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

from item No. 8.03
including OH & CP)

Transportation and fixing

f) Labour

Mate	day	0.351	0.351	0.351
Mason	day	0.798	0.798	0.798
Mazdoor including loading/unloading	day	7.980	7.980	7.980

g) Machinery

Tractor-trolley	hour	6.000	6.000	6.000
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h) Overhead charges

@ on (f+g) @ on (f+g) @ on (f+g)

i) Contractor's profit

@ on (f+g+h) @ on (f+g+h) @ on (f+g+h)

Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i

Rate for each 5th km stone = (a+b+c+ d+e +f+g+h +i) /6

8.14

(ii) Ordinary kilometer stone (precast)

Unit = Nos.

Taking output = 14 Nos.

a) M-15 grade of concrete (Rate taken from item No. 9.06, A, Case-II including OH & CP)	cum	3.770	3.770	3.770
b) Steel reinforcement @ 5 kg per sqm (Rate taken from items 9.07)/1000 including) OH & CP	kg	26.320	26.320	26.320
c) Excavation in soil for foundation (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	2.770	2.770	2.770
d) Painting two coats on concrete surface (Rate taken from item No. 8.08 including OH & CP)	sqm	11.410	11.410	11.410
e) Lettering on km post (average 12 letters of 10 cm height each) (Rate taken from item No. 8.03 including OH & CP)	per cm per letter	1680.000	1680.000	1680.000

Transportation and fixing

f) Labour

Mate	day	0.426	0.426	0.426
Mason	day	1.330	1.330	1.330
Mazdoor	day	9.310	9.310	9.310

g) Machinery

Tractor-trolley	hour	6.000	6.000	6.000
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h) Overhead charges

@ on (f+g) @ on (f+g) @ on (f+g)

i) Contractor's profit

@ on (f+g+h) @ on (f+g+h) @ on (f+g+h)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Cost for 14 Nos. ordinary km stone = (a+b+ c +d+e+f+g+h+i)

Rate for each ordinary km stone = (a+b+ c +d+e+f+g+h+j) / 14

8.14

(iii) Hectometer stone (precast)

Unit = Nos.

Taking output = 33 Nos.

a)	M-15 grade of concrete (Rate taken from item No. 9.06, A, Case-II including OH & CP)	cum	1.580	1.580	1.580
b)	Steel reinforcement @ 5 kg per sqm (Rate taken from items 9.07)/1000 including) OH & CP	kg	66.000	66.000	66.000
c)	Excavation in soil for foundation (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	1.390	1.390	1.390
d)	Painting two coats on concrete surface (Rate taken from item No. 8.08 including OH & CP)	sqm	6.270	6.270	6.270
e)	Lettering on km post (average 1 letter of 10 cm height each) (Rate taken from item No. 8.03 including OH & CP)	per cm per letter	330.000	330.000	330.000

Transportation and fixing

f) Labour					
Mate	day	0.452	0.452	0.452	
Mason	day	1.995	1.995	1.995	
Mazdoor	day	9.310	9.310	9.310	
g) Machinery					
Tractor-trolley	hour	6.000	6.000	6.000	
h) Overhead charges		@ on (f+g)	@ on (f+g)	@ on (f+g)	
i) Contractor's profit		@ on (f+g+h)	@ on (f+g+h)	@ on (f+g+h)	

Cost for 33 Nos. Hectometer stone = (a+b +c +d+e+f+ g+h+i)

Rate for each Hectometer stone = (a+b +c +d+e+f+ g+h+i) / 33

Note The rate for excavation, cement concrete, steel reinforcement, painting and lettering may be taken from respective chapters.

8.15

805

Road Delineators

Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80 x 100 mm rectangular or 75 mm dia circular

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

reflectorised panels at the top, buried or pressed into the ground and conforming to IRC-79 and the drawings.

Unit = Each

Taking output= 30 Nos.

a) Labour

Mate	day	0.053	0.053	0.053
Mazdoor for fixing	day	1.330	1.330	1.330

b) Material

Cost of approved type of delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	30.000	30.000	30.000
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Add 10 Percent cost of material for installation

c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Cost for 30 Nos. delineators = (a+b+ c+d)

Rate per delineators = (a+b+c+d) /30

Note In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.

8.16 806

Boundary pillar

Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25, fixed in position including finishing and lettering but excluding painting

Unit = Each

Taking output = 57 Nos.

a) M-15 grade of the boundary stone (Rate taken from item No. 9.06, A, Case-II including OH & CP)	cum	1.250	1.250	1.250
b) Steel reinforcement (Rate taken from items 9.07)/1000 including) OH & CP	kg	79.800	79.800	79.800
c) Excavation in soil (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	10.720	10.720	10.720
d) Lettering, each 10 cm high (Rate taken from item No. 8.03 including OH & CP)	per letter per cm high	2280.000	2280.000	2280.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Transportation and fixing					
		e) Labour					
		Mate	day	0.758	0.758	0.758	
		Mazdoor	day	18.953	18.953	18.953	
		f) Machinery					
		Tractor-trolley	hour	6.000	6.000	6.000	
		g) Material					
		Stone spall	cum	11.970	11.970	11.970	
		h) Overhead charges		@ on (e+f+g)	@ on (e+f+g)	@ on (e+f+g)	
		i) Contractor's profit		@ on (e+f+g+h)	@ on (e+f+g+h)	@ on (e+f+g+h)	

Cost for 57 Nos. boundary pillar = (a+b +c+d +e+ f+g+h+i)

Rate for each boundary pillar = (a+b+c+d+e+ f+g+h+i)/57

Note In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.

8.17 808

G.I Barbed Wire Fencing 1.2 Metre High

Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be struttred on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 817

Unit = per running metre

Taking output = 30 metres

a) Labour						
Mate	day	0.120	0.120	0.120		
Blacksmith	day	0.333	0.333	0.333		
Mazdoor	day	2.660	2.660	2.660		
b) Material						
Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	31.420	31.420		
MS angle iron 40 mm x 40mm x 6 mm, 23 metres in length @ 3.5 kg per metre	kg	80.500	80.500	80.500		
Add for GI staple binding wire, drilling holes etc. @ 2 Percent of the cost of material						
c) Painting						
Applying two coats of painting on	sqm	2.110	2.110	2.110		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

exposed surface of angle iron posts (Rate as per item no. 8.08)

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+d)	@ on (a+b+d)	@ on (a+b+d)

Cost for 30 metres fencing = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/30

Note Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.

8.18 808

G.I Barbed Wire Fencing 1.8 Metre High

Providing and fixing 1.8 metres high GI barbed wire fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be struted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 808

Unit = per running metre

Taking output = 30 metres

a) Labour					
Mate	day	0.154	0.154	0.154	
Blacksmith	day	0.532	0.532	0.532	
Mazdoor	day	3.325	3.325	3.325	
b) Material					
Barbed wire 428 metres length @ 9.38 kg per 100 metres	kg	40.150	40.150	40.150	
MS angle iron 50 mm x 50 mm x 6 mm, 33.8 metres in length @ 4.5 kg per metre	kg	152.000	152.000	152.000	
Add for GI staple, binding wire, drilling holes etc. @ 2 Percent of the cost of material					
c) Painting					
Applying two coats of painting on exposed surface of angle iron posts	sqm	3.960	3.960	3.960	
d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
e) Contractor's profit	@ on (a+b+d)	@ on (a+b+d)	@ on (a+b+d)		

Cost for 30 metres fencing = a+b+c+d+e

Rate per metre fencing = (a+b+c+d+e)/30

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Note Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.

8.19 Suggestive

Fencing With Welded Steel Wire Fabric 75 mm x 50 mm

Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be struttred, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.

Unit = Running metre

Taking output = 30 m

a) Labour

Mate	day	0.160	0.160	0.160
Welder	day	1.330	1.330	1.330
Mazdoor	day	2.660	2.660	2.660

b) Material

i) Angle iron for posts 50 x 50 x 6 mm	kg	106.000	106.000	106.000
ii) Runner flat 50 x 5 mm	kg	26.000	26.000	26.000
iii) Welded steel wire fabric 75x50 mm mesh @ 4 kg/sqm, 4 x 30 x 1.2 + 5 Percent wastage	kg	151.000	151.000	151.000

OR

Welded steel wire fabric 75 x 25 mm mesh @ 7.75 kg/sqm, 7.75 x 30 x 1.2 + 5 Percent wastage	kg	293.000	293.000	293.000
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Add 2.5 Percent of cost of material for drilling holes in angles, flats, splitting angle at bottom, nuts and bolts and welded consumables

c) Machinery

Tractor-trolley	hour	0.100	0.100	0.100
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d) Painting

Painting two coats including priming	sqm	8.000	8.000	8.000
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e) Overhead charges

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
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f) Contractor's profit

@ on (a+b+c+e)	@ on (a+b+c+e)	@ on (a+b+c+e)
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Cost for 30 metre = a+b+c+d+e+f

Rate per metre = (a+b+c+d+e+f)/30

Note i) Adopt any one type of welded steel wire fabric 75 x 50 mm or 75 x 25 mm as per approved design.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

- ii) The item of excavation and cement concrete in foundation shall be measured and paid separately

8.20 808

Tubular Steel Railing on Medium Weight Steel Channel (ISMC series) 100 mm x 50 mm

Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as per approved drawings

Unit = Running metre

Taking output = 10 metres

i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6						
(Rate taken from item No. 9.01 A (I) including OH & CP)	cum	1.296	1.296	1.296		
ii) Foundation concrete M-15 grade PCC 6 x 0.6 x 0.6 x 0.3						
(Rate taken from item No. 9.06, A, Case-II including OH & CP)	cum	0.648	0.648	0.648		
iii) Painting of pipe						
(Rate taken from item No.8.09 including OH & CP)	sqm	4.710	4.710	4.710		
iv) Painting of channel section 6 nos, 1.8 metres each 0.2 x 1.8 x 6 = 2.16						
	sqm	2.160	2.160	2.160		
a) Labour (For fixing at site)						
Mate	day	0.014	0.014	0.014		
Mazdoor	day	0.333	0.333	0.333		
Plumber	day	0.013	0.013	0.013		
b) Material						
Steel pipe 50 mm external dia as per IS:1239	metre	30.000	30.000	30.000		
Medium weight steel channel (ISMC series) 100 mm x 50 mm, 10.8 metres length @ 9.2 kg per metre	kg	99.360	99.360	99.360		
Add for drilling holes @ 2 Percent of cost of channels						
c) Machinery						
Tractor-trolley	hour	0.040	0.040	0.040		
d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e						
Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.21	808	Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to centre, complete as per approved drawing Unit = Running metre Taking output = 10 metres					
		i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6 (Rate taken from item No. 9.01 A (I) including OH & CP)	cum	1.296	1.296	1.296	
		ii) Foundation concrete M-15 grade PCC 6 x 0.6 x 0.6 x 0.3 (Rate taken from item No. 9.06, A, Case-II including OH & CP)	cum	0.648	0.648	0.648	
		iii) RCC M - 20 for pre cast posts 6 nos of 1.8 metres each (Rate taken from items 9.06 B Case-II including OH & CP)	cum	4.710	4.710	4.710	
		iv) Painting of pipe (Rate taken from item No. 8.09 including OH & CP)	sqm	2.160	2.160	2.160	
		a) Labour					
		Mate	day	0.014	0.014	0.014	
		Mazdoor	day	0.333	0.333	0.333	
		Plumber	day	0.013	0.013	0.013	
		b) Material					
		Steel pipe 50 mm dia as per IS:1239	metre	30.000	30.000	30.000	
		c) Machinery					
		Tractor-trolley	hour	0.040	0.040	0.040	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10					
8.22	811	Reinforced Cement Concrete Crash Barrier A Provision of an Reinforced cement concrete new jersey crash barrier at the medians, constructed with Reinforced Cement Concrete with HYSD reinforcement conforming to conforming MoRT&H Specification and as per details given IRC -119 (Fig.-26) including dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board					

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

etc., as per approved drawing and at locations directed by the Engineer, all as specified.

(Area-0.261 Sqm. /Meter, Double Face)

Unit = Linear metre

Taking output = 20 m

(i) M 25 grade concrete

a) M 25 grade concrete & HYSD steel reinforcement

M 25 grade concrete (Area-0.243 Sqm. /Meter)

(Rate taken from item No. 9.06 E Case-II including OH & CP)

HYSD steel reinforcement including dowel bars

cum 4.860 4.860 4.860

tonne 0.194 0.194 0.194

b) Labour

Mate

day 0.053 0.053 0.053

Mazdoor

day 1.330 1.330 1.330

c) Material

Pre-moulded asphalt filler board

sqm 0.250 0.250 0.250

d) Overhead charges

@ on (b+c) @ on (b+c) @ on (b+c)

e) Contractor's profit

@ on (b+c+d) @ on (b+c+d) @ on (b+c+d)

Cost for 20 metre = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/20

- Note**
- i) Excavation and backfilling are incidental to work and not to be measured separately.
 - ii) If PCC required below crash barrier then it should be measured & Paid separately.
 - iii) Rate for RCC M 25 may be taken from chapter-12 on foundation.

8.22 811 (ii) M 30 grade concrete

a) M 30 grade concrete & HYSD steel reinforcement

M 30 grade concrete (Area-0.243 Sqm. /Meter)

(Rate taken from item No. 9.06 E Case II including OH & CP)

HYSD steel reinforcement including dowel bars

cum 4.860 4.860 4.860

tonne 0.194 0.194 0.194

b) Labour

Mate

day 0.053 0.053 0.053

Mazdoor

day 1.330 1.330 1.330

c) Material

Pre-moulded asphalt filler board

sqm 0.250 0.250 0.250

d) Overhead charges

@ on (b+c) @ on (b+c) @ on (b+c)

e) Contractor's profit

@ on (b+c+d) @ on (b+c+d) @ on (b+c+d)

Cost for 20 metre = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/20

- Note**
- i) Excavation and backfilling are incidental to work and not to be measured separately.
 - ii) If PCC required below crash barrier then it should be measured & Paid separately.
Rate for RCC M 30 may be taken from chapter-12 on foundation.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		B Provision of an Reinforced cement concrete new jersey crash barrier at the medians, constructed with Reinforced Cement Concrete with HYSD reinforcement conforming to conforming MoRT&H Specification and as per details given IRC -119 (Fig.-26) including dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board etc., as per approved drawing and at locations directed by the Engineer, all as specified. (Area-0.261 Sqm. /Meter, Double Face) Unit = Linear metre Taking output = 20 m					
		(i) M 25 grade concrete a) M 25 grade concrete & HYSD steel reinforcement M 25 grade concrete (Area-0.261 Sqm. /Meter) (Rate taken from item No. 12.11 A (ii) Case-II including OH & CP) HYSD steel reinforcement including dowel bars	cum	5.220	5.220	5.220	
			tonne	0.209	0.209	0.209	
		b) Labour Mate Mazdoor	day	0.053	0.053	0.053	
			day	1.330	1.330	1.330	
		c) Material Pre-moulded asphalt filler board	sqm	0.250	0.250	0.250	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 20 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/20					
		Note i) Excavation and backfilling are incidental to work and not to be measured separately. ii) If PCC required below crash barrier then it should be measured & Paid separately. iii) Rate for RCC M 25 may be taken from chapter-12 on foundation.					
8.22	811	(ii) M 30 grade concrete a) M 30 grade concrete & HYSD steel reinforcement M 30 grade concrete (Area-0.261 Sqm. /Meter) (Rate taken from item No. 12.11 A (iii) Case II including OH & CP) HYSD steel reinforcement including dowel bars	cum	5.220	5.220	5.220	
			tonne	0.209	0.209	0.209	
		b) Labour Mate Mazdoor	day	0.053	0.053	0.053	
			day	1.330	1.330	1.330	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

c) Material

Pre-moulded asphalt filler board sqm 0.250 0.250 0.250

d) Overhead charges

@ on **@ on** **@ on**
(b+c) **(b+c)** **(b+c)**

e) Contractor's profit

@ on **@ on** **@ on**
(b+c+d) **(b+c+d)** **(b+c+d)**

Cost for 20 metre = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/20

- Note** i) Excavation and backfilling are incidental to work and not to be measured separately.
ii) If PCC required below crash barrier then it should be measured & Paid separately.
iii) Rate for RCC M 30 may be taken from chapter-12 on foundation.

8.23 811
A

Metal Beam Crash Barrier

Type - A, "W" : Metal Beam Crash Barrier

Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 811

Unit = Running metre

Taking output = 4.5 metre length

a) Labour

Mate	day	0.080	0.080	0.080
Blacksmith	day	0.665	0.665	0.665
Mazdoor	day	1.330	1.330	1.330

b) Machinery

Tractor-trolley	hour	0.100	0.100	0.100
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c) Material

Corrugated sheet, 3 mm thick, "W" beam section railing, 4.5 m in length	kg	41.210	41.210	41.210
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Channel post 150 x 75 x 5 mm, 1.8 m long, 3 Nos @ 16.4 kg per metre	kg	88.560	88.560	88.560
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Spacer 150 x 75 x 5 mm channel 0.33 m long, 3 Nos @ 16.4 kg per metre	kg	16.240	16.240	16.240
---	----	--------	--------	--------

Nuts and bolts	kg	20.000	20.000	20.000
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Add 25 Percent of the cost of material for fabrication, nuts, bolts and washers etc.)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 4.5 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/4.5					
8.23	B	Type - B, "THRIE" : Metal Beam Crash Barrier Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 811 Unit = Running metre Taking output = 4.5 metre length					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Blacksmith	day	0.665	0.665	0.665	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	
		c) Material					
		Corrugated sheet, 3 mm thick, "Thrie" beam section railing, 4.5 m in length	kg	72.940	72.940	72.940	
		Channel post 150 x 75 x 5 mm, 2 m long, 3 Nos @ 16.4 kg per metre	kg	98.400	98.400	98.400	
		Spacer 150 x 75 x 5 mm channel 0.546 m long, 3 Nos	kg	26.860	26.860	26.860	
		Nuts and bolts	kg	30.000	30.000	30.000	
		Add 15 Percent of the cost of material for fabrication, nuts, bolts and washers etc.)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 4.5 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/4.5					

Note: In the case of median crash barrier, 'W' metal beam or thrie beam section should be provided on both sides of the vertical posts fixed in the median. Extra provision for metal beam railing and spacer is required to be made when fixed in the median depending on approved design.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

8.24 811 Road Traffic Signals electrically operated

Note: Since it is a ready made item commercially produced and erected by specialised firm in the electrical and electronic field, rate may be taken based on market enquiry from firms specialised in this field and ISI certified for the approved design and drawing.

8.25 Suggestive Flexible Crash Barrier, Wire Rope Safety Barrier

Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete.

Unit = Running metre

Taking output = 15 metre

a) Labour

Mate	day	0.160	0.160	0.160
Mazdoor	day	2.660	2.660	2.660
Blacksmith	day	1.330	1.330	1.330

b) Material

i) RS Joist 100 x 75 mm - 16.5 m @ 11.5 kg per metre	kg	190.000	190.000	190.000
ii) Struts - 2 Nos. for terminal posts, 2 m long each 2 x 2 x 11.50	kg	46.000	46.000	46.000
iii) Tie 2 Nos. of 8 mm steel plate, 1.5 sqm each for terminal posts @ 62.80 kg/sqm (2 x 1.5)	kg	188.400	188.400	188.400
iv) Steel wire rope 40 mm, including 7.50 Percent extra for fixing at ends 15 x 4 x 1.075 @ 1 kg per m	kg	65.000	65.000	65.000

Add 5 Percent of cost of material for drilling, gripping, fixing, fabrication and welding consumables

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Painting Applying 2 coats of painting on exposed surface (Rate taken from item No. 8.09 including OH & CP)	sqm	16.500	16.500	16.500	
		d) Machinery Tractor-trolley	hour	0.250	0.250	0.250	
		e) Overhead charges		@ on (a+b+d)	@ on (a+b+d)	@ on (a+b+d)	
		f) Contractor's profit		@ on (a+b+d+e)	@ on (a+b+d+e)	@ on (a+b+d+e)	
		Cost for 15 m = a+b+c+d+e+f Rate per m = (a+b+c+d+e+f)/15					

Note: The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.

8.26 Suggestive

Anti-Glare Devices in Median

A Plantation

Plantation of shrubs and plants of approved species in the median. apart from cutting off glare from vehicle coming from opposite direction, these plants provide a pleasant environment and are eco-friendly. The rate for this item is available in the chapter 11 on horticulture.

B Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vane

Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one metre length and 1.75 metre height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per approved design and drawings.

Unit = Running metre

Taking output = one metre

a) Labour

Mate	day	0.005	0.005	0.005
Mazdoor	day	0.133	0.133	0.133

b) Material

i) 25 mm steel pipe	metre	16.000	16.000	16.000
ii) MS sheet for 600 x 300 x 3 mm rectangular vane, one number @ 24kg/sqm	kg	4.320	4.320	4.320

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		iii) MS sheet for 250 mm dia circular vane 3 mm thick, 4 numbers @ 24 kg/sqm Add 5 Percent cost of material for fabrication, welding, bending, nuts, bolts etc.	kg	4.800	4.800	4.800	
		c) Painting Applying 2 coats of painting on exposed surface (Rate taken from item No. 8.09 including OH & CP)	sqm	1.830	1.830	1.830	
		d) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		e) Contractor's profit		@ on (a+b+d)	@ on (a+b+d)	@ on (a+b+d)	
		Rate per metre = a+b+c+d+e					
Note The items of excavation and cement concrete as per approved design to be measured and paid separately							
8.26	C	Anti-glare screen with rectangular vane of MS sheet Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick and fixed on MS angle 50 x 50 x 6 mm at an angle of 45° to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in M-15 cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on exposed faces, all complete as per approved design and drawings Unit = Running metre Taking output = 1.50 metre					
		a) Labour					
		Mate	day	0.005	0.005	0.005	
		Mazdoor	day	0.133	0.133	0.133	
		b) Material					
		i) Angle iron post, 50 x 50 x 6 mm, length 2.35 m	kg	10.580	10.580	10.580	
		ii) MS sheet 3 mm thick @ 24 kg/sqm	kg	9.000	9.000	9.000	
		Add 5 Percent of cost of material for fabrication, nuts, bolts etc					
		c) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	
		d) Painting Applying 2 coats of painting (Rate taken from item No. 8.09 including OH & CP)	sqm	0.850	0.850	0.850	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

e) Overhead charges	@ on	@ on	@ on
	(a+b+c)	(a+b+c)	(a+b+c)
f) Contractor's profit	@ on	@ on	@ on
	(a+b+c+e)	(a+b+c+e)	(a+b+c+e)

Cost for 1.5 m = a+b+c+d+e+f

Rate per metre = (a+b+c+d+e+f)/1.50

Note The items of excavation and cement concrete as per approved design to be measured and paid separately. Rate of painting has been analysed separately in this chapter.

8.27 Suggestive

Street Lighting

Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 10 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.

Unit = Each

Taking output = one light

a) Labour

Mate	day	0.040	0.040	0.040
Mazdoor	day	0.665	0.665	0.665
Electrician	day	0.333	0.333	0.333

b) Material

i) Steel circular hollow pole of standard specification for street lighting to mount light at 10 m height above road level	each	1.000	1.000	1.000
ii) Sodium vapour lamp	each	1.000	1.000	1.000

Add 5 Percent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc.

c) Painting

For Fixing in Median

Providing two coats of aluminium paint over steel circular hollow pipe with overhang on both sides	sqm	5.750	5.750	5.750
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For fixing in Footpath

Providing two coats of aluminium paint over steel circular hollow pipe with overhang on one side	sqm	4.630	4.630	4.630
--	-----	-------	-------	-------

(i) For Fixing in Median

d) Overhead charges	@ on	@ on	@ on
	(a+b)	(a+b)	(a+b)
e) Contractor's profit	@ on	@ on	@ on
	(a+b+d)	(a+b+d)	(a+b+d)

Rate per light for fixing in Median= a+b+c+d+e

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

(ii) For fixing in Footpath

Rate per light for Fixing in Footpath = a+b+c+d+e

Note The items of excavation and cement concrete foundation will be measured and included separately in the estimate as per approved design and drawing. The rate for painting has been analysed in this chapter.

8.28 Suggestive

Lighting on Bridges

Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp

Unit = Each

Taking output = one light

a) Labour

Mate	day	0.032	0.032	0.032
Mazdoor	day	0.532	0.532	0.532
Electrician	day	0.266	0.266	0.266

b) Material

i) Steel circular hollow pole of standard specification for street lighting to mount light at 5 m above deck level	each	1.000	1.000	1.000
ii) Sodium vapour lamp 70 watt	each	1.000	1.000	1.000

Add 1 Percent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc

c) Painting

Providing two coats of aluminium paint over steel circular hollow pipe (Rate taken from item No. 8.09 including OH & CP)	sqm	2.760	2.760	2.760
--	-----	-------	-------	-------

d) Overhead charges

@ on (a+b)	@ on (a+b)	@ on (a+b)
------------	------------	------------

e) Contractor's profit

@ on (a+b+d)	@ on (a+b+d)	@ on (a+b+d)
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Rate per light = a+b+c+d+e

Note The items of cement concrete to be measured and paid separately as per approved design. The rate for painting has already been analysed in this chapter.

8.29 Suggestive

Cable Duct Across the Road

Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		of granular material over top and sides of RCC pipe as per IRC:98-1997, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 - 1997 and approved drawings.					
		(i) Single row for one utility service					
		Unit = Running metre					
		Taking output = 20metres					
		a) Random Rubble masonry/Brick masonry in cement mortar 1:6 for head wall both side	cum	2.360	2.360	2.360	
		(Rate taken from item No. 15.07 B including OH & CP)					
		b) Labour					
		Mate	day	0.067	0.067	0.067	
		Mazdoor	day	1.330	1.330	1.330	
		Mazdoor skilled	day	0.333	0.333	0.333	
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	20.000	20.000	20.000	
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 20 m)	cum	7.200	7.200	7.200	
		Collar for joints 300 mm dia	each	9.000	9.000	9.000	
		Cement mortar 1:2 for joints (Rate taken from item No. 15.05 B)	cum	0.020	0.020	0.020	
		d) Machinery					
		Tractor-trolley	hour	0.500	0.500	0.500	
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 20 metre = a+b+c+d+e+f					
		Rate per metre = (a+b+c+d+e+f)/20					
8.29		(ii) Double row for two utility services					
		Unit = Running metre					
		Taking output = 20metres					
		a) Random Rubble masonry/Brick masonry in cement mortar 1:6 for head wall both side	cum	3.370	3.370	3.370	
		(Rate taken from item No. 15.07 B)					
		b) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	2.660	2.660	2.660	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor skilled	day	0.333	0.333	0.333	
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	40.000	40.000	40.000	
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 40 m)	cum	14.400	14.400	14.400	
		Collar for joints 300 mm dia	each	18.000	18.000	18.000	
		Cement mortar 1:2 for joints (Rate taken from item No. 15.05 B)	cum	0.040	0.040	0.040	
		d) Machinery					
		Tractor-trolley	hour	1.000	1.000	1.000	
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 20 metre = a+b+c+d+e+f					
		Rate per metre = (a+b+c+d+e+f)/20					
8.29	(iii)	Triple Row for three utility services					
		Unit = Running metre					
		Taking output = 20 metres					
		a) Random Rubble masonry/Brick masonry in cement mortar 1:6 for head wall both side (Rate taken from item No. 15.07 B including OH & CP)	cum	4.380	4.380	4.380	
		b) Labour					
		Mate	day	0.213	0.213	0.213	
		Mazdoor	day	3.990	3.990	3.990	
		Mazdoor skilled	day	1.330	1.330	1.330	
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	60.000	60.000	60.000	
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 60 m)	cum	21.600	21.600	21.600	
		Collar for joints 300 mm dia	each	27.000	27.000	27.000	
		Cement mortar 1:2 for joints (Rate taken from sub-analysis 21.01 B)	cum	0.060	0.060	0.060	
		d) Machinery					
		Tractor-trolley	hour	1.500	1.500	1.500	
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 20 metre = a+b+c+d+e+f					
		Rate per metre = (a+b+c+d+e+f)/20					
Note	1.	Inspection chamber at both ends is the responsibility of the agency who is laying the duct. Hence not included.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

2. The rates for stone masonry / brick masonry and cement mortar to be adopted from respective clauses.

8.30 Suggestive Highway Patrolling and Traffic Aid Post

It is proposed to locate one Traffic Aid Post every 50-60 km of the highway. The organisation and financial aspect are required to be finalised in consultation with administrative and traffic authorities.

8.31 Suggestive Items Related to Underpass/ Subway/ Overhead Bridge/ Overhead Foot Bridge

The items involved for underpass/ subway/ overhead bridge/ overhead foot bridge are earthwork, plain cement concrete, plastering, painting, information sign etc. The rates for these items are available in respective chapters which can be adopted for the quantities derived from the approved designs and drawings

8.32 Suggestive Traffic Control System and Communication System

Providing a traffic control centre and communication system including telecommunication facilities and related accessories, CCTV, radar, vehicle detection camera, central computer system

These are specialised item of telecommunication system and are the commercial products. The designer is required to contact the manufacturers to ascertain market prices. In case of civil works required to be executed for these installations, pricing may be done as per rates in relevant chapters for quantities derived as per approved design and drawing.

As regards the locations where such devices are required to be installed, the traffic control authority should be consulted to finalise the location

8.33 Suggestive Gantry Mounted Variable Message Sign Board

Providing and erecting gantry mounted variable message sign board electronically operated capable of flashing the desired message over a

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		designed support system of aluminium alloy or galvanised steel, erected as per approved design and drawings and with lateral clearance as per clause 802.3					
		(i) Gantry Support System					
		Unit = tonne					
		Taking output=1 tonne					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	2.660	2.660	2.660	
		Blacksmith	day	1.330	1.330	1.330	
		b) Material					
		Aluminium alloy/galvanised steel including 5 Percent wastage	tonne	1.050	1.050	1.050	
		Add 15 Percent of cost of material for fabrication and erection.					
		Add 1 Percent of cost of material for nuts, bolts and welding					
		c) Machinery					
		Truck 10 tonne	hour	1.000	1.000	1.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per tonne = a+b+c+d+e					
8.33		(ii) Message Display					
		Message display board 6 sqm electronically operated with complete electronic fitments for flashing the pre-determined messages.					
		This is a specialised commercial product and the lump sum rate including erection at site is required to be ascertained from the market and including in the rate analysis. The size of the board will vary depending upon specific location.					
		The rate for the gantry mounted variable sign would be the addition of cost of gantry support system as per approved design determined at (i) above and the cost of message display board ascertained from the market at (ii) above					
8.34 Suggestive		Traffic Impact Attenuators at Abutments and Piers					
	A	With Scrap Tyres					
		Provision and installation of traffic attenuators at abutment/pier of flyovers bridges using scrap tyres of					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		size 100 x 20 retrieved from trucks laid in 2 rows and 4 tiers, one above the other and tied with 20 mm wire rope as per approved design and drawings.					
		Unit = sqm					
		Taking output = 20 sqm					
		a) Labour					
		Mate	day	0.093	0.093	0.093	
		Mazdoor	day	1.995	1.995	1.995	
		Blacksmith	day	0.333	0.333	0.333	
		b) Material					
		Scrap tyres of size 900 x 20	each	80.000	80.000	80.000	
		20 mm steel wire rope	kg	150.000	150.000	150.000	
		Add 1 Percent of cost of wire rope for clamps etc.					
		c) Machinery					
		Tractor-trolley	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 20 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/20					
8.34	B	Using Plastic/Steel Barrel, Filled with Sand					
		Provision and installation of traffic impact attenuator at abutment/pier of flyovers bridges using plastic/steel barrels 0.60 m dia and 1.0 m in height, filled with sand in three rows and tied with 20 mm steel wire rope as per approved design and drawings					
		Unit = sqm					
		Taking output = 20 sqm					
		a) Labour					
		Mate	day	0.173	0.173	0.173	
		Mazdoor	day	3.990	3.990	3.990	
		Blacksmith	day	0.333	0.333	0.333	
		b) Material					
		Plastic barrels	each	50.000	50.000	50.000	
		or					
		Steel barrels	each	50.000	50.000	50.000	
		Sand	cum	8.000	8.000	8.000	
		20 mm steel wire rope	kg	15.000	15.000	15.000	
		Add 1 Percent of cost of wire rope for clamps etc.					
		c) Machinery					
		Tractor-trolley	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 20 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/20					
8.34	C	With HI - DRO cell Sandwich (Patented) (In this patented HI - DRO cell system, water gets discharged from plastic tubes on impact over a pre-determined time, thus absorbing the energy) Providing and installing a patented HI - DRO cell system as a traffic impact attenuators, using plastic tubes 50 cm dia, 1.2 m in height, 25 mm opening at the top, placed in three rows, filled with water and tied with a 20 mm steel wire rope Unit = sqm Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.133	0.133	0.133	
		Mazdoor	day	3.325	3.325	3.325	
		b) Material					
		Plastic tubes 50 cm dia,1.2 m high	each	40.000	40.000	40.000	
		Cost of water	KL	12.000	12.000	12.000	
		20 mm steel wire rope	kg	100.000	100.000	100.000	
		Add 1 Percent of cost of wire rope for clamps etc.					
		c) Machinery					
		Tractor-trolley	hour	2.000	2.000	2.000	
		Water tanker 6 KL capacity	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/10					
8.35 Suggestive		Solar Powered Road Marker (Solar Stud) Supplying of Solar Raised Pavement Markers made of polycarbonate molded body with circular shape, solar powered,LED self illumination in active mode, 360 degree illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

to ASTM D 4280. The marker should be resistant to dust and water ingress according to IP 65 standards and should withstand temperatures in the range of 0 C to 70 C. Color of lighting could be provided in red or yellow (amber) as per requirement and typical frequency of blinking is 1 Hz. There should be current losses of less than 20 microamperes at 2.4 V in sleepcharging mode to enhance the life of the marker and a full charge should provide for a minimum autonomy of 50 hours. The height, width and length of the marker shall not be less than 10 mm x 100 mm x 100 mm. Also, the surface diameter of the marker shall not be less than 100 mm respectively. The weight of the marker shall not exceed 0.5 Kilograms. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the engineer.

Unit = Nos

Taking output = 50 Nos

a) Labour

Mate	day	0.053	0.053	0.053
Mazdoor	day	1.330	1.330	1.330

b) Material

Poly carbonate or ABS body and shall support a load of 13.635 Kg tested in accordance to ASTM D 4280 with height not exceeding 20mm and width/length not exceeding 130mm	each	50.000	50.000	50.000
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Add 10 Percent of cost of material for fixing and installation

c) Overhead charges

@ on (a+b)	@ on (a+b)	@ on (a+b)
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d) Contractor's profit

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
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Cost for 50 studs = a+b+c+d

Rate per studs = (a+b+c+d)/50

8.36 Suggestive

Traffic Cone

Provision of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Unit = Running metre							
Taking output = 68 Nos.							
a) Labour							
		Mate	day	0.027	0.027	0.027	
		Mazdoor	day	0.665	0.665	0.665	
b) Material							
		Traffic cones with 150 mm reflective sleeve	each	68.000	68.000	68.000	
c) Machinery							
		Tractor-trolley	hour	0.100	0.100	0.100	
d) Overhead charges							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit							
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Cost for 68 Nos. = a+b+c+d+e							
Rate per metre = (a+b+c+d+e)/68							

8.37 Suggestive

Roadside Amenities

A Rest areas

Providing plainly furnished accommodation for rest rooms, dormitories, restaurants, stalls, shops, petrol pump, telephone booth, first aid room, traffic aid post, police assistance booth, including electricity, toilet and sewerage system

Pricing may be done based on current plinth area rates approved by PWD/CPWD/MES for a particular zone. Area is required to be assessed for specific location as per actual site conditions

B Parking areas and bus lay byes for trucks, buses and light vehicles

Pricing of parking areas may be done for the quantities of various items based on the approved dimensions and pavement design for a particular terrain and soil. Rates for items may be from respective chapters.

C Lawn

Providing a lawn planted with grass and its maintenance

Pricing of lawn may be done as per rates given in the chapter on horticulture for the quantities as per approved dimensions in the drawings

8.38 Suggestive

Rumble Strips

Provision of 15 nos rumble strips covered with premix bituminous

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.					
		Unit = sqm					
		Taking output = 100 sqm (including gaps)					
		The rate per sqm of premix carpet and road marking may be adopted from chapter 5 & 8 respectively for the quantities calculated from approved drawings.					
8.39	Suggestive	Policeman Umbrella					
		Provision of a 2 m high (floor to roof) umbrella for traffic policeman at road crossings, where necessary, installed on a raised platform, built on a central support of a steel pipe 100 mm dia, roof made of 25 mm dia steel pipe to provide covered area of 3 sqm, roofed with CGI sheets, all steel parts to be given 2 coats of paint					
		Unit = each					
		Taking output = one number					
		Earthwork	cum	Quantities of these items to be calculated as per approved design and cost added as per rates of these items given in chapter 3 and 15			
		Cement Concrete	cum				
		brick masonry or	cum				
		stone masonry	cum				
		Painting					
		(Rate taken from item No. 8.09 including OH & CP)	sqm	2.500	2.500	2.500	
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	1.330	1.330	1.330	
		Blacksmith (1st class)	day	1.330	1.330	1.330	
		Welder	day	0.333	0.333	0.333	
		b) Material					
		Steel pipe 100 mm dia	metre	3.500	3.500	3.500	
		Steel pipe 25 mm dia	metre	10.000	10.000	10.000	
		CGI sheets (0.8 mm)	kg	8.000	8.000	8.000	
		Add 25 Percent of cost of material for fabrication					
		Add 2 Percent of cost of material for welding consumables, J-hooks, washers etc.					
		c) Machinery					
		Tractor-trolley	hour	0.500	0.500	0.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

e) Contractor's profit

@ on @ on @ on
(a+b+c+d) (a+b+c+d) (a+b+c+d)

Rate per policeman umbrella = a+b+c+d+e

8.40 suggestive

High Mast Pole Lighting at Interchanges and Flyovers

Providing and erecting a high mast pole lighting with 30 m high hot dip galvanised mast designed to withstand forces exerted with wind speeds of 180 km per hour with 3 seconds gust, as per IS:875 (Part 3) - 1978, fitted with a base flange, door at the base of mast with heavy duty internal lock, lantern carriage, suitable winching arrangement for safe working load of 750 kg and high powered electrically driven power tools for raising and lowering of lantern carriage, flexible 8 core electric cable, lightening conductor, earthing terminal, and fixing 2 nos aviation obstruction lights on top of the mast, all complete as per approved design and drawings

This is a specialised work and is generally done by firms who specialise in such jobs. The detailed designs and estimates are submitted by the firms along with their tender for checks by the Department. The cost of this work is required to be worked out based on approved design, drawings and estimate of the lowest tender. A separate contract for this work is concluded as the contractors for road and bridge works generally do not undertake such jobs.

8.41

Toll Plaza

The construction, operation and maintenance of Toll Plaza can be broken into separate items of work as under based on the approved design and drawings:-

- a) Provision of toll collection service lane to separate different categories of vehicles for purpose of toll collection. This involves considerable increase in carriage way width

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

- b) Provision of 2.5 m wide separators for different toll collection service lanes for safety
- c) Toll booths with integrated roof cover
- d) Barrier gates for individual lanes
- e) Provision of building to provide facility to toll plaza personnel
- f) Toll plaza office equipment and furniture
- g) Water supply, electricity, sanitation, septic-tank system and drainage
- h) Telephone, intercoms, wireless communication system
- i) High mast lighting
- j) Pavement marking
- k) Overhead signs
- l) Fixed message signs (Advance)
- m) Variable message signs
- n) Traffic cones and pylons
- o) First aid post
- p) Traffic aid post and security

The quantities for the above mentioned items may be calculated from the approved design and drawings and their rates adopted from respective chapters of the Standard Data Book.

8.42

Safety Devices and Signs in Construction Zones

Provision and fixing of traffic signs for limited period at suitable locations in construction zone comprising of warning zone, approach transition zone, working zone and terminal transition zone with a minimum distance of 60 cm from the edge of the kerb in case of kerbed roads and 2 to 3 m from the edge of the carriageway in case of un-kerbed roads, the bottom edge of the lowest sign plate to be not less than 2 m above the road level, fixed on 60 mm x 60 mm x 6 mm angle iron post, founded and installed as per approved design and drawings, removed and disposed of after completion of construction work, all as per IRC:SP:55

Unit = each

Taking output = one sign post

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Following types of signs are required to be fixed in construction zones for safety of traffic

- a) Diversion one km ahead
- b) Traffic sign ahead
- c) Road ahead closed
- d) Men at work
- e) Road narrow
- f) Single file traffic
- g) Right lane diverted
- h) Left lane diverted
- i) Right lane closed
- j) Left lane closed
- k) Median closed
- l) Diversion to other carriageway
- m) Traffic signal ahead
- n) Two way traffic
- o) Un - even road
- p) Slippery road
- q) Loose chippings
- r) Dual carriageway ends
- s) Diversion
- t) Do not enter
- u) Road closed
- v) Stop
- w) Slow
- x) One way
- y) Give way
- z) Overtaking prohibited
- aa) Speed limit
- bb) Weight limit
- cc) Height and length limit
- dd) No stopping or standing
- ee) Any other warning or regulatory safety sign as per site requirement and consistent with IRC:SP:55 and IRC:67

The rate for traffic signs are already worked out and given elsewhere in this chapter. The same may be adopted.

8.43 suggestive

Portable Barricade in Construction Zone

Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 45°, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = each					
		Taking output = one steel portable barricade					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	0.333	0.333	0.333	
		Painter	day	0.665	0.665	0.665	
		Welder	day	0.333	0.333	0.333	
		b) Material					
		Angle iron 45 x 45 x 5 mm	kg	25.000	25.000	25.000	
		MS sheet 300 mm wide, 2.5 m long and 2.6 mm thick	kg	15.000	15.000	15.000	
		Paint	litre	0.500	0.500	0.500	
		Add 2 Percent of cost of steel for welding consumables, nuts & bolts and drilling holes					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per barricade = a+b+c+d					
8.44	suggestive	Permanent Type Barricade in Construction Zone					
	A	With steel components					
		Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55					
		Unit = each					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.064	0.064	0.064	
		Mazdoor	day	0.399	0.399	0.399	
		Painter	day	0.798	0.798	0.798	
		Welder	day	0.399	0.399	0.399	
		b) Material					
		Angle iron 50 x 50 x 5 mm, 2 m long, 2 Nos.	kg	15.000	15.000	15.000	
		MS sheet of 12 SWG, 3 Nos of 200 mm width and 4 m length	kg	50.000	50.000	50.000	
		Paint	litre	1.000	1.000	1.000	
		Add 1 Percent of cost of steel for welding consumables, nuts & bolts and drilling holes					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per barricade = a+b+c+d					
8.44	B	With wooden components Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100mm wooden vertical post, painted with yellow and white strips, 150 mm in width at an angle of 45°, complete as per IRC:SP:55 Unit = each Taking output = one barricade					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	0.399	0.399	0.399	
		Painter	day	0.798	0.798	0.798	
		Carpenter	day	0.798	0.798	0.798	
		b) Material					
		Timber	cum	0.180	0.180	0.180	
		Add 1 Percent of cost of timber for nuts & bolts, nails, etc.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per barricade = a+b+c+d					
8.44	C	With bricks Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips Unit = each Taking output = one barricade					
		a) Labour					
		Mate	day	0.319	0.319	0.319	
		Mazdoor	day	3.990	3.990	3.990	
		Painter	day	1.330	1.330	1.330	
		Mason	day	2.660	2.660	2.660	
		b) Material					
		Brick	each	1800.000	1800.000	1800.000	
		Cement	kg	22.000	22.000	22.000	
		Sand	cum	0.090	0.090	0.090	
		Paint	litre	1.250	1.250	1.250	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per barricade = a+b+c+d					
8.45	suggestive	Drum Delineator in Construction Zone Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate Red and white 100 mm wide fitted with reflectors 3 Nos of 75 mm wide, all as per IRC:SP:55. Unit = each Taking output = one drum delineator					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor	day	0.333	0.333	0.333	
		Painter	day	0.333	0.333	0.333	
		b) Material					
		Steel drum 300 mm dia 1.2 m high/empty bitumen drum	each	1.000	1.000	1.000	
		Paint	litre	0.500	0.500	0.500	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per drum delineator = a+b+c+d					
8.46	suggestive	Water Filled Barricades Work zone sheeting Providing water filled barricades made up of LDPE to segregate the vehicular movement and work zone as per IRC SP 55 shall be in Trapezoidal Shape 800 mm to 1000 mm in length, 700 mm in height for Major Roads and expressway and 500 mm tall for other roads with interlocking arrangements, To be placed 0.5 m from the edge of the carriageway for expressway and 0.3 m for other roads. It should have reboundable work zone sheeting as per ASTM D 4956 S2. Unit = each Taking output = one drum delineator					
		a) Labour					
		Mate	day	0.013	0.013	0.013	
		Mazdoor	day	0.333	0.333	0.333	
		b) Material					
		Water Filled Barricades Work zone sheeting	each	1.000	1.000	1.000	

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per drum delineator = a+b+c+d					
8.47	suggestive	Tubular Marker/ Spring post 450 mm Providing Tubular Marker made up of Polyurethane used to divide opposing lanes of road users shall be flexible in nature. Tubular maker having height upto 450 mm shall be having 75 mm reboundable work zone retroreflective sheeting as per ASTM 4956 S2. Application of Tubular Marker Shall be done as per IRC SP 55 Unit = each Taking output = one drum delineator					
		a) Labour					
		Mate	day	0.013	0.013	0.013	
		Mazdoor	day	0.333	0.333	0.333	
		b) Material					
		Tubular Marker/ Spring post 450 mm	each	1.000	1.000	1.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per drum delineator = a+b+c+d					
8.48	suggestive	Tubular Marker/ Spring post 700 mm Providing Tubular Marker made up of Polyurethane used to divide opposing lanes of road users shall be flexible in nature. Tubular maker having minimum height 700 mm shall be having minimum 75 mm Reboundable work zone retroreflective sheeting as per ASTM 4956 S2. Application of Tubular Marker Shall be done as per IRC SP 55. Unit = each Taking output = one drum delineator					
		a) Labour					
		Mate	day	0.013	0.013	0.013	
		Mazdoor	day	0.333	0.333	0.333	
		b) Material					
		Tubular Marker/ Spring post 700 mm	each	1.000	1.000	1.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per drum delineator = a+b+c+d					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.49	suggestive	<p>Flagman</p> <p>Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic</p> <p>Unit = each</p> <p>Taking output = one flagman</p> <p>a) Labour</p> <p>Mate day 0.053 0.053 0.053</p> <p>Mazdoor day 1.330 1.330 1.330</p> <p>b) Material</p> <p>Flag of red color cloth 600 x 600 mm each 1.000 1.000 1.000</p> <p>Wooden staff for fastening of flag 25 mm dia, one m long each 1.000 1.000 1.000</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Rate per flagman = a+b+c+d</p>					
8.50	816	<p>Advanced Traffic Management Systems (ATMS) work shall cover design, supply, installation, commissioning and/or operation and maintenance of Advance Traffic Management Systems (which is one of the components of Intelligent Transport Systems - ITS). The system would include out-door equipment including emergency call boxes, variable message sign systems, meteorological data system, close circuit TV camera (CCTV) system, traffic counting and classification system and transmission system. The indoor equipment would comprise a large display board, central computer (with Network Management System - NMS), CCTV monitor system, call centre system or management of emergency call boxes housed in a control centre with uninterrupted power supply.</p> <p>A Traffic Management Command Centre Equipment</p> <p>Material</p> <p>A1 Control Centre Server Nos. 1.000 1.000 1.000</p> <p>A2 Hot Standby Backup Server Nos. 1.000 1.000 1.000</p> <p>A3 NAS Video Server with storage Minimum 70 TB Nos. 1.000 1.000 1.000</p> <p>A4 Backup Video (Only Incidents) Nos. 1.000 1.000 1.000</p>					

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Server					
	A5	Graphic Display (70" LED DLP in 3x2 matrix)	Set	1.000	1.000	1.000	
	A6	Graphic Display Controller and software including Video Switches	Set	1.000	1.000	1.000	
	A7	CCTV Monitoring Workstation	Nos.	1.000	1.000	1.000	
	A8	Emergency Telephone (1033) console	Nos.	1.000	1.000	1.000	
	A9	VIDS- Workstation	Nos.	1.000	1.000	1.000	
	A10	Administrative Workstation	Nos.	1.000	1.000	1.000	
	A11	ATMS Operator Workstation	Nos.	1.000	1.000	1.000	
	A12	CCTV Joystick	Nos.	1.000	1.000	1.000	
	A13	Operations Laser Printer (Colour)	Nos.	1.000	1.000	1.000	
	A14	Operations Laser Printer (Black)	Nos.	1.000	1.000	1.000	
	A15	Rack 19"	Nos.	1.000	1.000	1.000	
	B	Advanced Traffic Management Systems (ATMS) Software					
	B1	ATMS Control Room Software (integrated with VIDS, ATCC, VMS, MOS)	Nos.	1.000	1.000	1.000	
	B2	Video Management Software with atleast 150 VMS Lic.	Nos.	1.000	1.000	1.000	
	B3	Facility Monitoring System Controller Software	Nos.	1.000	1.000	1.000	
	B4	Server & Database license	Nos.	1.000	1.000	1.000	
	B5	Antivirus license	Nos.	1.000	1.000	1.000	
	C	PTZ Closed Circuit Television System					
		PTZ Camera (including CCTV Controller)	Set	1.000	1.000	1.000	
		Solar System with UPS, battery & 12m Pole & Cabinet	Set	1.000	1.000	1.000	
	D	Video Incident Detection System Equipment (VIDS)					
	D1	VIDS Camera (including Image Processing unit)	Set	1.000	1.000	1.000	
	D2	Warning amber lights with hooters, 72 Hrs solar backup, 5m poles and foundation	Set	1.000	1.000	1.000	
	D3	Cabinet	Nos.	1.000	1.000	1.000	
	D4	12 m Pole (including manufacturing and galvanizing)	Nos.	1.000	1.000	1.000	
	D5	Solar System with UPS & batteries	Set	1.000	1.000	1.000	
	E	Automatic Traffic Counters-cum-classifier System Equipment (ATCC)					
	E1	Equipment, Sensor unit, Processing unit, Solar power supply	Set	1.000	1.000	1.000	
	E3	Solar System with UPS, batteries	Set	1.000	1.000	1.000	
	F	Variable Message Sign Equipment (VMS)					

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
F1		VMS (Variable Message Sign - M type)	Nos.	1.000	1.000	1.000	
F2		Gantry (including manufacturing and galvanizing)	Nos.	1.000	1.000	1.000	
F3		Solar System with UPS, battery and cabinet for M type VMS	Set	1.000	1.000	1.000	
G		UPS and Power system					
G1		Uninterruptible Power Supply (UPS) For Server Rack (10 KVA)	Set	1.000	1.000	1.000	
G2		Uninterruptible Power Supply (UPS) For TMC (30 KVA)	Set	1.000	1.000	1.000	
G3		Power Distribution Board (Essential & Critical Supply)	Set	1.000	1.000	1.000	
H		Meteorological Observation System (MOS)					
H1		MOS sensor Equipment (including MOS Controller)	Set	1.000	1.000	1.000	
H2		Cabinet	Nos.	1.000	1.000	1.000	
H3		Pole	Nos.	1.000	1.000	1.000	
H4		Steel fence for protection	Set	1.000	1.000	1.000	
I		Digital Transmission System (DTS)					
I1		24 Core Armoured OFC + all accessories	Km	1.000	1.000	1.000	
I2		40 mm PLB HDPE duct as per latest TSEC specifications + all accessories	Km	1.000	1.000	1.000	
I3		Trenching of 1.8 meters, Laying & Backfilling for PLB HDPE duct	Km	1.000	1.000	1.000	
Note Overhead and contractor profit will be add separately on Item no 8.50 .							
Civil works required to be executed for these installations, pricing may be done as per rates in relevant chapters for quantities derived approved design and drawing.							
8.51	suggestive	Fiber Reinforced Cement Concrete new jersey crash barrier					
		Unit = Linear metre					
		Taking output = 20 m					
A		Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with Reinforced Cement Concrete with fiber steel and as per details given IRC -5 (Fig.-5, b) including dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board etc., as per approved drawing and at locations directed by the Engineer, all as specified. (Area-0.243 Sqm. /Meter, Single Face)					
		a) M 30 grade concrete					
		M 30 grade concrete (Area-0.243 Sqm. /Meter)(Rate taken	cum	4.860	4.860	4.860	

CHAPTER: 8- TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

from item No. 12.11 A (iii) Case II including OH & CP)

b) Labour

Mate day 0.053 0.053 0.053

Mazdoor day 1.330 1.330 1.330

c) Material

Fiber Steel (35 Kg / Cum) tonne 0.170 0.170 0.170

d) Overhead charges

@ on (b+c) @ on (b+c) @ on (b+c)

e) Contractor's profit

@ on (b+c+d) @ on (b+c+d) @ on (b+c+d)

Cost for 20 metre = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/20

- Note** i) Excavation and backfilling are incidental to work and not to be measured separately.
ii) If PCC required below crash barrier then it should be measured & Paid separately.
iii) Rate for RCC M 30 may be taken from chapter on 12.

- 8.15 B** Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with Reinforced Cement Concrete with fiber steel and as per details given IRC -119 (Fig.-26) including dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board etc., as per approved drawing and at locations directed by the Engineer, all as specified.
(Area-0.261 Sqm. /Meter, Double Face)

(i) a) M 30 grade concrete

M 30 grade concrete (Area-0.261 Sqm. /Meter)
(Rate taken from item No. 12.11 A (iii) Case II including OH & CP)

cum 5.220 5.220 5.220

b) Labour

Mate day 0.053 0.053 0.053

Mazdoor day 1.330 1.330 1.330

c) Material

Fiber Steel (35 Kg / Cum) tonne 0.183 0.183 0.183

d) Overhead charges

@ on (b+c) @ on (b+c) @ on (b+c)

e) Contractor's profit

@ on (b+c+d) @ on (b+c+d) @ on (b+c+d)

Cost for 20 metre = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/20

- Note** i) Excavation and backfilling are incidental to work and not to be measured separately.
ii) If PCC required below crash barrier then it should be measured & Paid separately.
iii) Rate for RCC M 30 may be taken from chapter on 12.

CHAPTER – 9

PIPE CULVERTS

PREAMBLES:

- 1 Excavation for structures has been provided both by manual and mechanical means. The rate relevant to a particular situation may be adopted.
- 2 The earth excavated from foundation has been proposed to be backfilled and balance quantity utilized for road work locally except for marshy soil where disposal has been provided.
- 3 Pipe culverts of size 1000 mm, 1200 mm & 1500 mm dia in single row and double row which are generally used on roads, have been included. Only laying pipe has been included in the rate. Auxiliary works such as excavation, backfilling, concrete and masonry shall be paid for separately, as provided under the respective clauses.
- 4 Any river training and protection work like stone pitching, apron, revetment, curtain wall etc. may be provided under the respective clauses included in Chapter 16.
- 5 The choice between first class bedding and cement cradle bedding will depend on particular situations and approved design.
- 6 The joining of pipes is proposed by collar or flush joints.
- 7 Backfilling upto 300 mm above top of the pipe shall be carefully done and the soil thoroughly rammed, tamped or vibrated in layers not exceeding 150 mm.
- 8 Head walls and other ancillary works shall be executed under respective clauses.
- 9 Pipe shall be laid at least 600 mm below from the top of road.

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
9.01	304	Excavation for Structures Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.					
		I Ordinary soil Unit = cum Taking output = 10 cum					
		A Manual Means (i) Depth upto 3 m					
		a) Labour					
		Mate	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note					
		1. Cost of dewatering may be added where required upto, 10 Percent of labour cost Assessment for dewatering shall be made as per site conditions.					
		2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 9.01 excluding marshy soil.					
		3. The cost of shoring and shuttering, where needed, may be added @ 1 Percent on cost of excavation for open foundation.					
9.01	A	(ii) Depth 3 m to 6 m					
		a) Labour					
		Mate/Supervisor	day	0.239	0.239	0.239	
		Mazdoor	day	5.985	5.985	5.985	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note					
		1. Cost of dewatering may be added where required upto 15 Percent of labour cost.					
		2. Assessment for dewatering shall be done as per actual ground conditions.					
9.01	A	(iii) Depth above 6 m					
		a) Labour					
		Mate/Supervisor	day	0.319	0.319	0.319	
		Mazdoor	day	7.980	7.980	7.980	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note					
		1. Cost of dewatering may be added where required upto 20 Percent of labour cost.					
		2. Assessment for dewatering shall be made as per site conditions.					

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
9.01	B	(i) Mechanical Means (Depth upto 3 m) Unit = cum Taking output = 330 cum a) Labour Mate day 0.426 0.426 0.426 Mazdoor day 10.640 10.640 10.640 b) Machinery Hydraulic Excavator For excavation (i) 1.2 cum bucket capacity hour 5.508 (ii) 1.1 cum bucket capacity hour 6.344 (iii) 0.9 cum bucket capacity hour 8.869 For backfilling (considering 60% of the excavated material) (i) 1.2 cum bucket capacity hour 3.305 (ii) 1.1 cum bucket capacity hour 3.806 (iii) 0.9 cum bucket capacity hour 5.321 Tipper for transportation of excess material to dumping yard considering lead @ 1 km (i) 18 cum capacity t-km 198.000 (ii) 14 cum capacity t-km 198.000 (iii) 10 cum capacity t-km 198.000 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 330 cum = a+b+c+d Rate per cum = (a+b+c+d)/330					
9.01	B	(ii) Mechanical Means (Depth 3 m to 6 m) Unit = cum Taking output = 300 cum a) Labour Mate day 0.426 0.426 0.426 Mazdoor day 10.640 10.640 10.640 b) Machinery Hydraulic Excavator For excavation					

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	5.564			
		(ii) 1.1 cum bucket capacity	hour		6.408		
		(iii) 0.9 cum bucket capacity	hour			8.958	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.338			
		(ii) 1.1 cum bucket capacity	hour		3.845		
		(iii) 0.9 cum bucket capacity	hour			5.375	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/300					
9.01	B	(iii) Mechanical Means (Depth above 6 m) Unit = cum Taking output = 270 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator For excavation					
		(i) 1.2 cum bucket capacity	hour	5.634			
		(ii) 1.1 cum bucket capacity	hour		6.488		
		(iii) 0.9 cum bucket capacity	hour			9.070	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.380			
		(ii) 1.1 cum bucket capacity	hour		3.893		

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 0.9 cum bucket capacity	hour			5.442	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t-km	162.000			
		(ii) 14 cum capacity	t-km		162.000		
		(iii) 10 cum capacity	t-km			162.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 270 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 270					
9.01	II	Ordinary Rock (not requiring blasting)					
	A	Manual Means					
	(i)	Depth upto 3 m					
		Unit = cum					
		Taking output = 10 cum					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	6.650	6.650	6.650	
		b) Overhead charges @ on (a)					
		c) Contractor's profit @ on (a+b)					
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
	Note	1. Cost of dewatering upto 10 Percent of labour cost may be added, where required.					
		2. Assessment for dewatering shall be made as per site conditions.					
9.01	B	Mechanical Means					
		Unit = cum					
		Taking output = 50 cum					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		b) Machinery					
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	6.926			
		(ii) 1.1 cum bucket capacity	hour		8.149		
		(iii) 0.9 cum bucket capacity	hour			8.658	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For loading					
		(i) 1.2 cum bucket capacity	hour	1.039			
		(ii) 1.1 cum bucket capacity	hour		1.196		
		(iii) 0.9 cum bucket capacity	hour			1.672	
		Jack Hammer	hour	6.926	8.149	8.658	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 cum capacity	t-km	75.000			
		(ii) 14 cum capacity	t-km		75.000		
		(iii) 10 cum capacity	t-km			75.000	
		For loading & unloading time					
		(i) 18 cum capacity	hour	1.039			
		(ii) 14 cum capacity	hour		1.196		
		(iii) 10 cum capacity	hour			1.672	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 50 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 50					
9.01	III	Hard Rock (requiring blasting)					
	A	Manual Means					
		Unit = cum					
		Taking output = 10 cum					
		a) Labour					
		Mate	day	0.466	0.466	0.466	
		Driller	day	0.665	0.665	0.665	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.000	1.000	1.000	
		c) Material					
		Explosives (Blasting Material)	kg	3.500	3.500	3.500	
		Detonator electric	each	14.000	14.000	14.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 10					

- Note**
1. Cost of dewatering @ 10 Percent of (a+b) may be added, where required.
 2. Assessment for dewatering shall be made as per site conditions.

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)	
				Large	Medium	Small		
9.01	301 & 302	III	Hard Rock (requiring blasting)					
			Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303					
		B	Mechanical Means					
			Unit = cum					
			Taking output = 120 cum					
		a)	Labour					
			Mate	day	0.279	0.279	0.279	
			Mazdoor	day	3.990	3.990	3.990	
			Driller	day	2.660	2.660	2.660	
			Blaster	day	0.333	0.333	0.333	
		b)	Machinery					
			Air compressor	hour	6.000	6.000	6.000	
			Jack Hammer for drilling holes (@ 4.5 m per hour)	hour	24.000	24.000	24.000	
			Jack Hammer (consider 5% of the volume for dressing)	hour	1.219	1.219	1.219	
			Hydraulic Excavator					
			Excavator for excavation					
			(i) 1.2 cum bucket capacity	hour	1.219			
			(ii) 1.1 cum bucket capacity	hour		1.219		
			(iii) 0.9 cum bucket capacity	hour			1.219	
			For loading					
			(i) 1.2 cum bucket capacity	hour	2.493			
			(ii) 1.1 cum bucket capacity	hour		2.871		
			(iii) 0.9 cum bucket capacity	hour			4.013	
			Tipper					
			For transportation considering lead @ 1 km					
			(i) 18 cum capacity	t-km	180.000			
			(ii) 14 cum capacity	t-km		180.000		
			(iii) 10 cum capacity	t-km			180.000	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For loading & unloading time					
		(i) 18 cum capacity	hour	2.493			
		(ii) 14 cum capacity	hour		2.871		
		(iii) 10 cum capacity	hour			4.013	
		c) Materials					
		Small dia Explosive at 0.40 kg / cum for 120 cum (120 x 0.40) Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (120 x 0.2x5%)	kg	48.000	48.000	48.000	
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos	no	69.000	69.000	69.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes(required for 5% of the total quantity @ 0.6 m per hole for I cum)	no	7.000	7.000	7.000	
		Detonating fuse coil	m	213.000	213.000	213.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 120					
9.01	301, 302	IV Hard Rock (blasting prohibited)					
		Unit = cum					
		Taking output = 35 cum					
		A Mechanical Means					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Jack Hammer	hour	7.111	8.889	10.940	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	7.111			
		(ii) 1.1 cum bucket capacity	hour		8.889		
		(iii) 0.9 cum bucket capacity	hour			10.940	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.727			

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		0.837		
		(iii) 0.9 cum bucket capacity	hour			1.171	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t-km	52.500			
		(ii) 14 cum capacity	t-km		52.500		
		(iii) 10 cum capacity	t-km			52.500	
		For loading & unloading time					
		(i) 18 cum capacity	hour	0.727			
		(ii) 14 cum capacity	hour		0.837		
		(iii) 10 cum capacity	hour			1.171	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 35 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 35					
9.01	V	Marshy Soil					
		Unit = cum					
		Taking output = 10 cum					
		Depth upto 3 m					
	A	Manual means					
		a) Labour					
		Mate/Supervisor	day	0.532	0.532	0.532	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Tractor-trolley for removal.	hour	2.670	2.670	2.670	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 10					
	Note	1. Cost of dewatering @ 30 Percent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. Shoring & strutting 15 Percent of (a), where required may be added					
		3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item12.01 (i) to (iv) for ordinary soil					
9.01	B	Mechanical Means					
		Unit = cum					
		Taking output = 260 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	10.126			
		(ii) 1.1 cum bucket capacity	hour		11.662		
		(iii) 0.9 cum bucket capacity	hour			16.304	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t-km	390.000			
		(ii) 14 cum capacity	t-km		390.000		
		(iii) 10 cum capacity	t-km			390.000	
		For loading & unloading time					
		(i) 18 cum capacity	hour	10.126			
		(ii) 14 cum capacity	hour		11.662		
		(iii) 10 cum capacity	hour			16.304	
		c) Material					
		Selected earth for refilling	cum	156.000	156.000	156.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 260 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 260					
9.02	304	Sand Filling in Foundation Trenches as per Drawing & Technical Specification					
		Unit = cum					
		Taking output = 100 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 10 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.16			
		(ii) 12 KL capacity	hour		0.333 x L1 + 0.213		
		(iii) 6 KL capacity	hour			0.667 x L1 + 0.427	
		c) Material					
		Sand (assuming 20 Percent voids) at site	cum	120.000	120.000	120.000	
		Water	KL	18.000	18.000	18.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per 100 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 100					
9.03		PCC 1:3:6 in Foundation					
		Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.					
		Unit = cum					
		Taking output = 15 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	9.310	9.310	9.310	
		b) Material					
		Plain cement concrete 1:3:6 nominal mix using batching plant (Rate taken from sub-analysis 21.02)	cum	15.000	15.000	15.000	
		Water	KL	3.240	3.240	3.240	
		c) Machinery					
		Plate Compactor	hour	1.000	1.000	1.000	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.045 x L1 + 0.135			
		(ii) 12 KL capacity	hour		0.06 x L1 + 0.18		
		(iii) 6 KL capacity	hour			0.12 x L1 + 0.36	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 15					

Note Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

9.04 2900

Laying Reinforced Cement Concrete Pipe NP4 / Pre-stressed Concrete Pipe on First Class Bedding in Single Row.

Laying Reinforced cement concrete pipe NP4/pre-stressed concrete pipe for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .

Unit = metre

Taking output = 12.5 metres

(5 pipes of 2.5 m length each)

A 1000 mm dia

a) Labour

Mate	day	0.133	0.133	0.133
Mason	day	0.665	0.665	0.665
Mazdoor	day	2.660	2.660	2.660

b) Material

Sand at site	cum	0.070	0.070	0.070
Cement at site	tonne	0.050	0.050	0.050
RCC pipe NP-4 /pre-stressed concrete pipe including collar at site	metre	12.500	12.500	12.500
Granular material passing 5.6 mm sieve for bedding	cum	4.500	4.500	4.500

c) Machinery

Light Crane 3 tonnes capacity for placing of Hume pipe	hour	2.083	2.083	2.083
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d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 12.5 metres = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/12.5

- Note**
1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added.
 2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections

9.04

B 1200 mm dia

a) Labour

Mate	day	0.213	0.213	0.213
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CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		b) Material					
		Sand at site	cum	0.090	0.090	0.090	
		Cement at site	tonne	0.070	0.070	0.070	
		RCC pipe NP-4/pre-stressed concrete pipe including collar at site	metre	12.500	12.500	12.500	
		Granular material passing 5-6 mm sieve for class bedding	cum	5.000	5.000	5.000	
		c) Machinery					
		Light Crane 3 tonnes capacity for handling Hume pipe	hour	2.083	2.083	2.083	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 12.5 metres = a+b+c+d+e					
		Rate per metre= (a+b+c+d+e)/ 12.5					
	Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added. 2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
9.04	C	1500 mm dia					
		a) Labour					
		Mate	day	0.213	0.213	0.213	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		b) Material					
		Sand at site	cum	0.090	0.090	0.090	
		Cement at site	tonne	0.070	0.070	0.070	
		RCC pipe NP-4/pre-stressed concrete pipe including collar at site	metre	12.500	12.500	12.500	
		Granular material passing 5-6 mm sieve for class bedding	cum	5.750	5.750	5.750	
		c) Machinery					
		Light Crane 3 tonnes capacity for handling Hume pipe	hour	2.500	2.500	2.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 12.5 metres = a+b+c+d+e					
		Rate per metre= (a+b+c+d+e)/ 12.5					
	Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added. 2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

9.05 2900

Laying Reinforced Cement Concrete Pipe NP4 / Pre-stressed Concrete Pipe on First Class Bedding in Double Row.

Laying Reinforced cement concrete pipe NP4 / pre-stressed concrete pipe for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .

Unit = metre

Taking output = 12.5 metres (10 pipes of 2.5 m length each in two rows.)

A 1000 mm dia

a) Labour

Mate	day	0.266	0.266	0.266
Mason	day	1.330	1.330	1.330
Mazdoor	day	5.320	5.320	5.320

b) Material

Sand at site	cum	0.140	0.140	0.140
Cement at site	tonne	0.100	0.100	0.100
RCC pipe NP-4/pre-stressed concrete pipe including collar at site	metre	25.000	25.000	25.000
Granular material passing 5.6 mm sieve for bedding	cum	12.500	12.500	12.500

c) Machinery

Light Crane 3 tonnes capacity for handling Hume pipe	hour	4.167	4.167	4.167
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d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 12.5 metres = a+b+c+d+e

Rate per metre = (a+b+c+d+e)/ 12.5

- Note**
1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added.
 2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
9.05	B	1200 mm dia					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mason	day	2.660	2.660	2.660	
		Mazdoor	day	7.980	7.980	7.980	
		b) Material					
		Sand at site	cum	0.180	0.180	0.180	
		Cement at site	tonne	0.140	0.140	0.140	
		RCC pipe NP-4 /pre-stressed concrete pipe including collar at site	metre	25.000	25.000	25.000	
		Granular material passing 5-6 mm sieve for class bedding	cum	13.750	13.750	13.750	
		c) Machinery					
		Light Crane 3 tonnes capacity for handling Hume pipe	hour	4.167	4.167	4.167	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 12.5 metres = a+b+c+d+e					
		Rate per metre= (a+b+c+d+e)/ 12.5					

- Note**
1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added.
 2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections

9.05	C	1500 mm dia					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mason	day	2.660	2.660	2.660	
		Mazdoor	day	7.980	7.980	7.980	
		b) Material					
		Sand at site	cum	0.180	0.180	0.180	
		Cement at site	tonne	0.140	0.140	0.140	
		RCC pipe NP-4 /pre-stressed concrete pipe including collar at site	metre	25.000	25.000	25.000	
		Granular material passing 5-6 mm sieve for class bedding	cum	15.625	15.625	15.625	
		c) Machinery					
		Light Crane 3 tonnes capacity for handling Hume pipe	hour	5.000	5.000	5.000	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 12.5 metres = a+b+c+d+e					
		Rate per metre= (a+b+c+d+e)/ 12.5					
	Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added . 2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
9.06	1500, 1700 & 2100	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.					
9.06	A Case I	PCC Grade M15 PCC Grade M15 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/ 30					
Case II PCC Grade M15 using batching plant transit mixer & manual placing							
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost cum		15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.03)					
		Water for curing Kl		7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate		0.505	0.505	0.505	
		Mason		1.995	1.995	1.995	
		Mazdoor		10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)		37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading		0.833	0.833	0.833	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity hour		0.109 x L1 + 0.328			
		(ii) 12 KL capacity hour			0.146 x L1 + 0.438		
		(iii) 6 KL capacity hour				0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/ 15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
9.06	B	PCC Grade M20					
	Case I	PCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.04)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/ 30					
	Case II	PCC Grade M20 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/ 15					
9.06	C	RCC Grade M20					
	Case I	RCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.05)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum tonne- Capacity)	km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II RCC Grade M20 using batching plant transit mixer & manual placing							
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub- analysis 21.05)					
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum tonne- Capacity)	km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
9.06	D	PCC Grade M25					
	Case I	PCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

d) **Formwork @ 10 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery

e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)

Cost for 30 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/30

**Case II PCC Grade M25 using
batching plant transit mixer &
manual placing**

Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis 21.06)	cum	15.000	15.000	15.000
Water for curing	Kl	7.875	7.875	7.875

b) Labour

For pouring and placing

Mate	day	0.505	0.505	0.505
Mason	day	1.995	1.995	1.995
Mazdoor	day	10.640	10.640	10.640

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1
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For unloading	hour	0.833	0.833	0.833
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Water tanker (speed @
km/hr and return speed
@ km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.109 x L1 + 0.328		
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(ii) 12 KL capacity	hour		0.146 x L1 + 0.438	
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(iii) 6 KL capacity	hour			0.292 x L1 + 0.875
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d) **Formwork @ 10 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery

e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
9.06	E	RCC Grade M25					
	Case I	RCC Grade M25 using batching plant transit mixer & Concrete pump					
		<i>Unit = cum</i>					
		<i>Taking output = 30 cum</i>					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	RCC Grade M25 using batching plant transit mixer & manual placing					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	15.000	15.000	15.000	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
9.07	1600	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		Unit = MT					
		Taking output = 8 MT					
		a) Material					
		MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	

CHAPTER: 9- PIPE CULVERTS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine & Bending Machine	hour	5.333	5.333	5.333	
		Electric generator 15 KVA	hour	5.333	5.333	5.333	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					

CHAPTER – 10

MAINTENANCE OF ROADS

PREAMBLES:

- 1 In case of rain cuts, it has been assumed that some material cut by rain, approximately 25 Percent, will be available at site which can be retrieved and re-used and the balance 75 Percent is required to be provided as fresh material.
- 2 For making up earthen shoulders, it has been assumed that on an average 150 mm filling will be required. Similarly, for stripping of excess soil from the shoulder, an average depth of 75 mm has been assumed.
- 3 In the case of chocking of drain, it has been assumed that half the depth of drain has been filled with earth/debris, which requires clearance.
- 4 During the process of landslide clearance on hill roads, it has been assumed that earth will be disposed off by the dozer on the valley side. In case there is any objection to this arrangement due to particular site conditions, resources like loader and tripper will have to be provided for disposal of earth/debris for the lead involved.
- 5 Pot-hole repair and patchwork are provided to be done by mechanical means.
- 6 The rates for items like slurry seal, fog spray, crack prevention courses, surface dressing & micro-surfacing for maintenance works have been included in Chapter-5.
- 7 The cost of other items like repair of ruts and undulation maintenance of earthen shoulders, cross drainage works, minor and major bridges and miscellaneous items like turfing and arboriculture, painting and lettering on km stones, repair to signage, repair to footpath, street light, railing, dividers, separators and under passes for pedestrians has been given in the “Report of the Committee on Norms for Maintenance of Roads in India” published by IRC in January 2001 which may be referred for guidance.
- 8 The repair items related to bridges have been given in Chapter-17.

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.01	3002	Restoration of Rain Cuts Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes Unit = cum Taking output = 10 cum					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.009			
		(ii) 1.1 cum bucket capacity	hour		0.010		
		(iii) 0.9 cum bucket capacity	hour			0.014	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	12 x L2			
		(ii) 14 cum capacity	t.km		12 x L2		
		(iii) 10 cum capacity	t.km			12 x L2	
		For loading & unloading					
		(i) 18 cum capacity	hour	0.009			
		(ii) 14 cum capacity	hour		0.010		
		(iii) 10 cum capacity	hour			0.014	
		Plate compactor	hour	0.500	0.500	0.500	
		c) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		d) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/10					

Note Only 75 Percent of fresh material has been provided as 25 Percent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of there in cuts

10.02 3003 Maintenance of Earthen Shoulder (filling with fresh soil)
 Making up loss of material/irregularities on shoulder to

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		the design level by adding fresh approved soil and compacting it with appropriate equipment. Unit = sqm Taking output = 100 sqm Assuming average thickness of filling to be 150 mm Quantity of fresh material = 15 Cum					
		a) Labour					
		Mate	day	0.239	0.239	0.239	
		Mazdoor	day	5.985	5.985	5.985	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.013			
		(ii) 1.1 cum bucket capacity	hour		0.015		
		(iii) 0.9 cum bucket capacity	hour			0.021	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	24 x L2			
		(ii) 14 cum capacity	t.km		24 x L2		
		(iii) 10 cum capacity	t.km			24 x L2	
		For loading & unloading					
		(i) 18 cum capacity	hour	0.013			
		(ii) 14 cum capacity	hour		0.015		
		(iii) 10 cum capacity	hour			0.021	
		Plate compactor @ 25 sqm per hour	hour	12.000	12.000	12.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/100					
10.03	3003	Maintenance of Earth Shoulder (stripping excess soil) Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor Unit = sqm Taking output = 100 sqm Assuming average depth of stripping as 75 mm					

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Quantity of earth cutting involved = 7.5 cum					
		a) Labour					
		Mate	day	0.133	0.133	0.133	
		Mazdoor	day	3.325	3.325	3.325	
		b) Machinery					
		Plate compactor @ 25 sqm per hour	hour	4.000	4.000	4.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 sqm = a+b+c+d					
		Rate per sqm on = (a+b+c+d)100					

Note The earth stripped from earthen shoulders to be dumped on the side slopes locally for disposal.

10.04 3004.2

Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20mm.

Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 510, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2

Unit = Sqm

Taking out put = 10250 sqm

a) Labour						
Mate	Day	5.001	5.001	5.001		
Mazdoor	Day	119.700	119.700	119.700		
Mazdoor skilled	Day	5.320	5.320	5.320		
b) Machinery						
Hot Mix Plant						
(i) HMP 200 TPH	hour	2.893				
(ii) HMP 160 TPH	hour		3.616			
(iii) HMP 120 TPH	hour				4.821	
Mechanical broom (2.1m sweeping width)	hour	3.051	3.051	3.051		
Air compressor 250 cfm	hour	3.051	3.051	3.051		
Electric generator						
(i) 500 KVA	hour	2.893				
(ii) 400 KVA	hour		3.616			

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 250 KVA	hour			4.821	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.893			
		(ii) 2.1 Cum Capacity	hour		3.616		
		(iii) 1 Cum Capacity	hour			4.821	
		Tipper					
		For Transportation					
		(i) 18 cum capacity	t.km	405 x L			
		(ii) 14 cum capacity	t.km		405 x L		
		(iii) 10 cum capacity	t.km			405 x L	
		For loading & unloading time					
		(i) 18 cum capacity	hour	2.893			
		(ii) 14 cum capacity	hour		3.616		
		(iii) 10 cum capacity	hour			4.821	
		Smooth steel wheeled tandem roller for static and vibratory passes	hour	17.277	17.277	17.277	
		c) Material					
		Crushed stone aggregates nominal size 13.2mm	cum	184.500	184.500	184.500	
		Crushed stone aggregates nominal size 11.2mm	cum	92.250	92.250	92.250	
		Bitumen 80/100	tonne	14.970	14.970	14.970	
		Bitumen emulsion for tack coat including vertical sides of pot hole.	tonne	2.460	2.460	2.460	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10250 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/ 10250					

10.05 3004.2

Filling Pot-holes and Patch Repairs with Bituminous concrete, 40mm.

Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Unit = Sqm							
Taking out put = 4900 sqm							
a) Labour							
		Mate	Day	3.884	3.884	3.884	
		Mazdoor	Day	93.100	93.100	93.100	
		Mazdoor skilled	Day	3.990	3.990	3.990	
b) Machinery							
Hot Mix Plant							
		(i) HMP 200 TPH	hour	3.214			
		(ii) HMP 160 TPH	hour		4.018		
		(iii) HMP 120 TPH	hour			5.357	
		Mechanical broom (2.1m sweeping width)	hour	1.458	1.458	1.458	
		Air compressor 250 cfm	hour	1.458	1.458	1.458	
Electric generator							
		(i) 500 KVA	hour	3.214			
		(ii) 400 KVA	hour		4.018		
		(iii) 250 KVA	hour			5.357	
Front end loader for feeding the plant							
		(i) 3.1 Cum Capacity	hour	3.214			
		(ii) 2.1 Cum Capacity	hour		4.018		
		(iii) 1 Cum Capacity	hour			5.357	
Tipper							
For Transportation							
		(i) 18 cum capacity	t.km	450 x L			
		(ii) 14 cum capacity	t.km		450 x L		
		(iii) 10 cum capacity	t.km			450 x L	
For loading & unloading time							
		(i) 18 cum capacity	hour	3.214			
		(ii) 14 cum capacity	hour		4.018		
		(iii) 10 cum capacity	hour			5.357	
Smooth steel wheeled tandem roller for static and vibratory passaes							
			hour	16.518	16.518	16.518	
c) Material							
		i) Bitumen	tonne	23.890	23.890	23.890	
		ii) Bitumen emulsion for tack coat.	tonne	1.180	1.180	1.180	
		iii) Aggregates					
Grading I - 19mm(Nominal size)							
		20-10mm 38 percent	cum	108.255	108.255	108.255	
		10-5 mm 17 percent	cum	48.430	48.430	48.430	
		5mm and below43 percent	cum	122.499	122.499	122.499	
		Filler @ 2 per cent of weight of aggregates.	tonne	8.546	8.546	8.546	
Add 5 Percent for wastage or							

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Grading-II 13mm (Nominal size)					
		13.2-10 mm 21 percent	cum	59.825	85.500	85.500	
		10-5 mm 17 percent	cum	48.430	71.250	71.250	
		5 mm and Below 60 percent	cum	170.928	122.550	122.550	
		Filler 2 percent	tonne	8.546	8.546	8.546	
		Add 5 Percent for wastage					
		Any one of the above alternatives of aggregate i.e. 19mm or 13mm nominal size may be adopted as per approved design.					
10.05	(i)	for grading I Material					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 4900 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/ 4900					
10.05	(ii)	for grading II Material					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 4900 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/ 4900					
Note For detailed working of quantities of aggregates & bitumen, refer item 5.05 of chapter 5.							
10.06	3004.3.3	Crack Filling					
		Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.					
		Unit = Running Meter					
		Taking out put = 500 m					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Material					
		Slow-curing bitumen emulsion	Kg	33.000	33.000	33.000	
		Stone crusher dust	cum	0.020	0.020	0.020	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 500 meter = a+b+c+d					
		Rate per meter = (a+b+c+d+e)/ 500					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.07	3004.4	Dusting Applying crusher dust to areas of road where bleeding of excess bitumen has occurred. Unit = Sqm Taking output = 3500 sqm a) Labour Mate day 0.106 0.106 0.106 Mazdoor day 2.660 2.660 2.660 b) Material Stone crusher dust finer than 3mm with not more than 10 Percent passing 0.075 sieve. cum 6.250 6.250 6.250 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 3500 sqm = a+b+c+d Rate per meter = (a+b+c+d)/ 3500					
10.08	(A) 3004.3.2	Fog Seal	sqm				
	(B) 3004.3.4	Crack Prevention courses.					
		(i) Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm				
		(ii) Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm				
		(iii) Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 Percent	sqm				
		(iv) Bitumen Impregnated Geotextile	sqm				
10.08	(C) 3004.5	Slurry Seal					
		(i) 5 mm thickness	sqm				
		(ii) 3 mm thickness	sqm				
		(iii) 1.5 mm thickness	sqm				
10.08	(D) 3004.6	Surface Dressing for maintenance works.					
		(i) 19 mm nominal chipping size	sqm				
		(ii) 13 mm nominal size chipping	sqm				

Note The above mentioned items have already been included in chapter 5.

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.09	3005.1	Repair of Joint Grooves with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete Unit = running metre Taking output = 10 metres					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	0.665	0.665	0.665	
		Chiseller	day	0.665	0.665	0.665	
		b) Material					
		Epoxy primer	kg	2.500	2.500	2.500	
		Epoxy compound with accessories for preparing epoxy mortar	kg	10.000	10.000	10.000	
		c) Machinery					
		Air compressor 250 cfm for cleaning	hour	0.050	0.050	0.050	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 metres = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/ 10					
10.10	3005.2	Repair of old Joints Sealant Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material Unit = running metre Taking output = 10 metres					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mazdoor	day	0.665	0.665	0.665	
		b) Material					
		Primer	kg	0.250	0.250	0.250	
		Sealant	kg	1.000	1.000	1.000	
		c) Machinery					
		Air compressor 250 cfm for cleaning	hour	0.050	0.050	0.050	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 metres = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/ 10					

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.11	3000	Hill Side Drain Clearance Removal of earth from the choked hill side drain and disposing it on the valley side manually Unit = running metre Taking output = 10 metres Assuming muck causing choking of drain to be 0.2 cum per metre, quantity of earth to be removed for 10 metres = 2 cum a) Labour Mate day 0.040 0.040 0.040 Mazdoor day 1.000 1.000 1.000 b) Overhead charges @ on (a) @ on (a) @ on (a) c) Contractor's profit @ on @ on @ on (a+b) (a+b) (a+b) Cost for 10 metres = a+b+c Rate per metre = (a+b+c)/10					
10.12	3000	Land Slide Clearance in soil Clearance of land slides in soil and ordinary rock by a bulldozer D 80 A-12, 180 HP and disposal of the same on the valley side Unit = cum Taking output = 100 cum a) Labour Mate day 0.040 0.040 0.040 Mazdoor day 1.000 1.000 1.000 b) Machinery Dozer 175 HP hour 1.670 1.670 1.670 c) Overhead charges @ on @ on @ on (a+b) (a+b) (a+b) d) Contractor's profit @ on @ on @ on (a+b+c) (a+b+c) (a+b+c) Cost for 100 cum = a+b+c+d Rate per cum = (a+b+c+d)/100					
Note Land Slide clearance involves pushing of loose earth slid on the road surface from hill face on the valley side. Since no cutting of original ground is involved, the output of dozer has been taken as 60 cum per hour for soil, ordinary rock and blasted hard rock. However, if there are objection to disposing of earth on valley side, additional resources for its disposal shall be considered as per site conditions.							
10.13	3000	Landslide Clearance in Hard Rock Requiring Blasting Clearing of land slide in hard rock requiring blasting for 50 Percent of the boulders and disposal of the same on the					

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

valley side.

Unit = cum

Taking output = 100 cum

a) Labour

Mate	day	0.093	0.093	0.093
Mazdoor	day	1.500	1.500	1.500
Driller	day	0.750	0.750	0.750
Blaster	day	0.070	0.070	0.070

b) Machinery

Dozer 175 HP	hour	1.670	1.670	1.670
Air compressor 250 cfm with two jack hammer	hour	2.500	2.500	2.500

c) Materials

Explosives	kg	17.500	17.500	17.500
Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	70.000	70.000	70.000

c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 100 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/ 100

Note Credit for the rock if found acceptable as construction material shall be afforded

10.14 3000 A Snow Clearance on Roads with Dozer

Snow clearance from road surface by a bull- dozer 165 Hp and disposing it on the valley side

Unit = cum

Taking output = 5000 cum

a) Labour

Mate	day	0.080	0.080	0.080
Mazdoor	day	2.000	2.000	2.000

b) Machinery

Dozer 175 HP	hour	5.880	5.880	5.880
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c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 5000 cum = a+b+c+d

Rate per cum = (a+b+c+d)/ 5000

Note i) Labour provided will not be cutting the snow. They will be guiding the dozer operator on the alignment of the road as entire surface gets covered with snow and the edges of the road are not visible and for changing the blade angle. Also they will keep a watch on the hill side for any eventuality of avalanches, slide etc.

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																				
				Large	Medium	Small																					
10.14	B	<p>Snow Clearance on Roads with Backhoe-loader</p> <p>Snow clearance from road surface by a Backhoe-loader and disposing it on the valley side</p> <p>Unit = cum</p> <p>Taking output = 5000 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.200</td><td>0.200</td><td>0.200</td></tr><tr><td>Mazdoor</td><td>day</td><td>5.000</td><td>5.000</td><td>5.000</td></tr></table> <p>b) Machinery</p> <table><tr><td>Backhoe-loader</td><td>hour</td><td>10.200</td><td>10.200</td><td>10.200</td></tr></table> <p>Cost for 5000 cum = a+b+c+d</p> <p>Rate per cum = (a+b+c+d)/ 5000</p>	Mate	day	0.200	0.200	0.200	Mazdoor	day	5.000	5.000	5.000	Backhoe-loader	hour	10.200	10.200	10.200										
Mate	day	0.200	0.200	0.200																							
Mazdoor	day	5.000	5.000	5.000																							
Backhoe-loader	hour	10.200	10.200	10.200																							
	Note	Labour provided will not be cutting the snow. They will be guiding the Backhoe-loader operator on the alignment of the road as entire surface gets covered with snow and the edges of the road are not visible. Also they will keep a watch on the hill side for any eventuality of avalanches, slide etc.																									
10.15	3000	<p>Snow Clearance on Roads with Snow Blowers</p> <p>Snow clearance from road surface by a snow blower and disposing on the valley side.</p> <p>Unit = cum</p> <p>Taking output = 3600 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.080</td><td>0.080</td><td>0.080</td></tr><tr><td>Mazdoor</td><td>day</td><td>2.000</td><td>2.000</td><td>2.000</td></tr></table> <p>b) Machinery</p> <table><tr><td>Snow blower equipment 175 HP @ 600 cum per hour</td><td>hour</td><td>6.000</td><td>6.000</td><td>6.000</td></tr></table> <p>c) Overhead charges</p> <table><tr><td>@ on (a+b)</td><td>@ on (a+b)</td><td>@ on (a+b)</td></tr></table> <p>d) Contractor's profit</p> <table><tr><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td></tr></table> <p>Cost for 3600 cum (a+b+c+d)</p> <p>Rate per cum = (a+b+c+d)/ 3600</p>	Mate	day	0.080	0.080	0.080	Mazdoor	day	2.000	2.000	2.000	Snow blower equipment 175 HP @ 600 cum per hour	hour	6.000	6.000	6.000	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)				
Mate	day	0.080	0.080	0.080																							
Mazdoor	day	2.000	2.000	2.000																							
Snow blower equipment 175 HP @ 600 cum per hour	hour	6.000	6.000	6.000																							
@ on (a+b)	@ on (a+b)	@ on (a+b)																									
@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																									
10.16	811	<p>Replacement of Metal Beam Crash Barrier</p> <p>Type - A, "W" : Metal Beam Crash Barrier</p> <p>Replacement of "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed</p>																									
	A																										

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 811					
		Unit = Running metre					
		Taking output = 4.5 metre					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Blacksmith	day	0.665	0.665	0.665	
		Mazdoor	day	1.995	1.995	1.995	
		b) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	
		c) Material					
		Corrugated sheet, 3 mm thick, "W" beam section railing, 4.5 m in length	kg	41.210	41.210	41.210	
		Channel post 150 x 75 x 5 mm, 1.8 m long, 3 Nos @ 16.4 kg per metre	kg	88.560	88.560	88.560	
		Spacer 150 x 75 x 5 mm channel 0.33 m long, 3 Nos @ 16.4 kg per metre	kg	16.240	16.240	16.240	
		Nuts and bolts	kg	20.000	20.000	20.000	
		Add 25 Percent of the cost of material for fabrication, nuts, bolts and washers etc.)					
		Credit for salvage value of dismantled material	kg	166.010	166.010	166.010	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 4.5 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/ 4.5					
B		Type - B, "THRIE" : Metal Beam Crash Barrier					
		Replacement of "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground					

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 811					
		Unit = Running metre					
		Taking output = 4.5 metre					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Blacksmith	day	0.665	0.665	0.665	
		Mazdoor	day	1.995	1.995	1.995	
		b) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	
		c) Material					
		Corrugated sheet, 3 mm thick, "Thrie" beam section railing, 4.5 m in length	kg	72.940	72.940	72.940	
		Channel post 150 x 75 x 5 mm, 2 m long, 3 Nos @ 16.4 kg per metre	kg	98.400	98.400	98.400	
		Spacer 150 x 75 x 5 mm channel 0.546 m long, 3 Nos	kg	26.860	26.860	26.860	
		Nuts and bolts	kg	30.000	30.000	30.000	
		Add 15 Percent of the cost of material for fabrication, nuts, bolts and washers etc.)					
		Credit for salvage value of dismantled material	kg	228.200	228.200	228.200	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 4.5 metre = a+b+c+d+e					
		Rate per metre= (a+b+c+d+e)/ 4.5					
10.17		Network Survey Vehicle (NSV) attached with SUV					
		Data collection of Longitudinal profiling (International Roughness Index), Transverse profiling (Rut Depth), Pavement					

CHAPTER: 10- MAINTENANCE OF ROADS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Texture in terms of Mean Profile Depth, Road Geometry Data (cross slope, gradient, curvature), GPS coordinates (X, Y, Z) viz. longitude, latitude & altitude, Video imaging for Roadside furniture / Road Assets and Video imaging for Pavement Surface Distresses and reports.

Unit = Lane Kilometer

Taking output = 200 Lane Km

a) Labour

Mate	day	0.468	0.468	0.468
Mazdoor (skilled)	day	11.700	11.700	11.700

b) Machinery

Network Survey Vehicle (NSV)	hour	8.000	8.000	8.000
Network Survey Vehicle (NSV) Mobilization & demobilization	hour	15.000	15.000	15.000

Add 1 Percent of cost of a+b for Miscellaneous work

c) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

d) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 200 Km = a+b+c+d

Rate per Km = (a+b+c+d)/200

- Note:** (i) Average Distance has been considered 300 km for mobilization at working site and same for demobilization
(ii) Speed of vehicle 40 Km/hr. has been considered.
(iii) The survey speed shall be within 30 to 80 kmph.

10.18

Falling weight deflectometer (FWD)

Unit = Lane Kilometer

Taking output = 120 Lane Km

a) Labour

Mate	day	0.158	0.158	0.158
Mazdoor (skilled)	day	1.300	1.300	1.300
Mazdoor	day	2.660	2.660	2.660

b) Machinery

Falling weight deflectometer (FWD) Equipment	hour	8.000	8.000	8.000
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Falling weight deflectometer (FWD) Equipment Mobilization & demobilization	hour	15.000	15.000	15.000
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Add 1 Percent of cost of
a+b for Miscellaneous
work

c) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
d) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 120 Km = a+b+c+d

Rate per Km = (a+b+c+d)/120

Note: (i) Average Distance has been considered 300 km for mobilization at working site and same for demobilization
(ii) Speed of vehicle 40 Km/hr. has been considered.

10.19

**Road Retroreflectorometer
attached with SUV**

Unit = Km

Taking output =50 Km

a) Labour				
Mate	day	1.560	1.560	1.560
Mazdoor (skilled)	day	26.000	26.000	26.000
Mazdoor	day	13.000	13.000	13.000
b) Machinery				
Falling weight deflectometer (FWD)	hour	80.000	80.000	80.000
Equipment Falling weight deflectometer (FWD)	hour	15.000	15.000	15.000
Equipment Mobilization & demobilization				
Add 1 Percent of cost of a+b as Miscellaneous work				
c) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
d) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Cost for 50 Km = a+b+c+d

Rate per Km = (a+b+c+d)/50

Note: (i) Average Distance has been considered 300 km for mobilization at working site and same for demobilization
(ii) Speed of vehicle 40 Km/hr. has been considered.
(iii) The Km is only for one side if road is more than 2 lane

10.20

**Automatic Vehicle Counter
Classifier (ATCC)**

Unit = Per Location

Taking output = 1 Location

a) Labour				
Mate	day	2.205	2.205	2.205
Mazdoor (skilled)	day	0.520	0.520	0.520
Mazdoor	day	54.600	54.600	54.600

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Automatic Vehicle Counter Classifier (ATCC) Equipment etc.	hour	168.000	168.000	168.000	
		Sport utility vehicle (SUV) including Mobilization & demobilization	hour	72.000	72.000	72.000	
		Data processing and Report charges	Lumpsum	1.000	1.000	1.000	
		Add 1 Percent of cost of a+b as Miscellaneous work					
		c) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		d) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Cost for 1 location = a+b+c+d

Rate per Location = (a+b+c+d)/ 1

- Note:** (i) Average interval of location has been considered 50 Km
(ii) The duration of traffic counting 24 hours for 7 days has been considered for one location

CHAPTER – 11

HORTICULTURE

PREAMBLES:

- 1 The items of turving with sods and seeding and mulching have been included in the chapter of earthwork.
- 2 The analysis of rates for grassing of lawns and hedges has been included, as the same may be needed for resting places on highways.
- 3 Five types of tree guards as under have been provided:
 - a) Half brick circular type.
 - b) Tree guards made from empty bitumen drums 1.30 m high
 - c) Tree guards made from empty bitumen drums 2.00 m high
 - d) Tree guards with MS flat iron
 - e) Tree guards with MS angle and 3 mm steel wire welded on MS flat and bolted to angle iron posts

Section from above may be made as per actual situation and design.

- 4 Analysis of rates for wrought iron and mild steel welded work has been included to cater for any miscellaneous work in connection with horticulture, fencing and traffic sign.
- 5 Though the estimate for compensatory afforestation is made by the forest department, the rate for this item has been analysed and included for the purpose of estimation.
- 6 In the rate analysis of some items, the quantities of sub-items involved in that analysis, like, excavation for foundation, foundation concrete, painting, lettering, etc. have been given. The rates for such items may be taken from relevant chapters where the same have already been analysed.

CHAPTER: 11- HORTICULTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																								
				Large	Medium	Small																									
11.01	307	<p>Spreading of Sludge Farm Yard Manure or/and good Earth</p> <p>Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)</p> <p>Unit = cum</p> <p>Taking output = 15 cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.053</td><td>0.053</td><td>0.053</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table> <p>b) Overhead charges @ on (a) @ on (a) @ on (a)</p> <p>c) Contractor's profit @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>Cost for 15 cum= a+b+c</p> <p>Rate per cum = (a+b+c)/15</p>	Mate	day	0.053	0.053	0.053	Mazdoor	day	1.330	1.330	1.330																			
Mate	day	0.053	0.053	0.053																											
Mazdoor	day	1.330	1.330	1.330																											
11.02	307	<p>Grassing with ' Doobs' Grass</p> <p>Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed</p> <p>Unit = sqm</p> <p>Taking output = 100 sqm</p> <p>(i) In rows 15 cm apart in either direction</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.093</td><td>0.093</td><td>0.093</td></tr><tr><td>Mazdoor for grassing</td><td>day</td><td>0.998</td><td>0.998</td><td>0.998</td></tr><tr><td>Mazdoor for maintenance for 30 days</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table> <p>b) Machinery</p> <table><tr><td>Water tanker 6 KL capacity</td><td>hour</td><td>0.500</td><td>0.500</td><td>0.500</td></tr></table> <p>c) Material</p> <table><tr><td>Doob grass</td><td>kg</td><td>100.000</td><td>100.000</td><td>100.000</td></tr></table> <p>d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)</p>	Mate	day	0.093	0.093	0.093	Mazdoor for grassing	day	0.998	0.998	0.998	Mazdoor for maintenance for 30 days	day	1.330	1.330	1.330	Water tanker 6 KL capacity	hour	0.500	0.500	0.500	Doob grass	kg	100.000	100.000	100.000				
Mate	day	0.093	0.093	0.093																											
Mazdoor for grassing	day	0.998	0.998	0.998																											
Mazdoor for maintenance for 30 days	day	1.330	1.330	1.330																											
Water tanker 6 KL capacity	hour	0.500	0.500	0.500																											
Doob grass	kg	100.000	100.000	100.000																											

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Cost for 100 sqm = a+b+c+d+e
Rate per sqm= (a+b+c+d+e)/100

11.02	(ii)	In rows 7.5 cm apart in either direction				
	a)	Labour				
		Mate	day	0.120	0.120	0.120
		Mazdoor for grassing.	day	1.663	1.663	1.663
		for maintenance for 30 days	day	1.330	1.330	1.330
	b)	Machinery				
		Water tanker 6 KL capacity	hour	0.750	0.750	0.750
	c)	Material				
		Doob grass	kg	200.000	200.000	200.000
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Cost for 100 sqm = a+b+c+d+e
Rate per sqm = (a+b+c+d+e)/100

Note In the case of horticulture one mate has been provided for every 10 mazdoors as maintenance of grass and plants require more care.

11.03	307	Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm Unit = sqm Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor for preparation of ground	day	0.665	0.665	0.665	
		Mali for fetching doobs grass roots and grassing at 15 cm apart	day	1.330	1.330	1.330	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	0.500	0.500	
		Tractor with tipper	hour	0.010	0.010	0.010	
		c) Material					
		Supply of farm yard manure at site of work	cum	0.180	0.180	0.180	
		Fine grass	kg	100.000	100.000	100.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 100 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/ 100					
11.04	307	Maintenance of Lawns or Turfing of Slopes					
		Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.532	0.532	0.532	
		Mali	day	13.300	13.300	13.300	
		b) Machinery					
		Water tanker 6 KL capacity	hour	15.000	15.000	15.000	
		c) Material					
		Cost of water	KL	90.000	90.000	90.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 100 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/ 100					
11.05	307	Turfing Lawns with Fine Grassing including Ploughing, Dressing					
		Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying doobs grass					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		<p>roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 sqm</p> <p>Unit = sqm</p> <p>Taking output = 100 sqm</p> <p>a) Labour</p> <p>Mate day 0.133 0.133 0.133</p> <p>Mazdoor for day 1.330 1.330 1.330</p> <p>preparation of ground</p> <p>Mali for fetching day 1.995 1.995 1.995</p> <p>doobs grass roots hedges and grassing at 10 cm apart</p> <p>b) Machinery</p> <p>Water tanker 6 hour 0.500 0.500 0.500</p> <p>KL capacity</p> <p>Tractor with tiller hour 0.010 0.010 0.010</p> <p>c) Material</p> <p>Supply of farm cum 0.600 0.600 0.600</p> <p>yard manure at site of work @ 0.6 cum per 100 sqm</p> <p>Fine grass kg 100.000 100.000 100.000</p> <p>d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)</p> <p>Cost for 100 sqm = a+b+c+d+e</p> <p>Rate per sqm = (a+b+c+d+e)/ 100</p>					
11.06	307	<p>Maintenance of Lawns with Fine Grassing for the First Year</p> <p>Maintenance of lawns with fine grassing for the first year including watering etc</p> <p>Unit = sqm</p> <p>Taking output = 100 sqm</p> <p>a) Labour</p> <p>Mate day 0.532 0.532 0.532</p> <p>Mali day 13.300 13.300 13.300</p> <p>b) Machinery</p> <p>Water tanker 6 hour 20.000 20.000 20.000</p> <p>KL capacity</p> <p>c) Material</p> <p>Cost of water KL 60.000 60.000 60.000</p> <p>d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 100 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/100					
11.07	307	Planting and Maintaining of Permanent Hedges (a) Planting permanent hedges including digging of trenches Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart Unit = Running metre Taking output = 100 metre					
		a) Labour					
		Mate	day	0.745	0.745	0.745	
		Mazdoor for digging of trench 60 cm wide and 45 cm deep	day	13.300	13.300	13.300	
		Mazdoor for refilling the excavated earth mixed with cow dung, preparation of ground and digging of plant, from the nursery carriage to site and planting in position	day	5.320	5.320	5.320	
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	0.500	0.500	
		c) Material					
		Cost of hedge plants 2 rows at 30 cm apart	each	2x340	2x340	2x340	
		Supply of farm yard manure at site of work	cum	4.670	4.670	4.670	
		Pesticide	kg	0.250	0.250	0.250	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost of water	KL	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 100 metres = a+b+c+d+e					
		Rate per metre = a+b+c+d+e)/100					
		(b) Maintenance of hedge for one year					
		Unit = Running metre					
		Taking output = 100 m					
		a) Labour					
		Mate	day	1.596	1.596	1.596	
		Mazdoor	day	39.900	39.900	39.900	
		b) Machinery					
		Water tanker 6 KL capacity	hour	5.000	5.000	5.000	
		c) Material					
		Manure	cum	2.000	2.000	2.000	
		sludge/Farm yard manure					
		Pesticide	kg	0.500	0.500	0.500	
		Cost of water	KL	30.000	30.000	30.000	
		Cost of hedge plants @ 10	each	68.000	68.000	68.000	
		Percent casualty					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 100 metres = a+b+c+d+e					
		Rate per metre = a+b+c+d+e)/100					
11.08	307	Planting and Maintaining of Flowering Plants and Shrubs					
		(a) Planting flowering plants and shrubs in central verge					
		Unit = RM					
		200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3 m and above.					
		Taking output = 1000 metres					
		a) Labour					
		Mate	day	0.638	0.638	0.638	
		Mazdoor	day	15.960	15.960	15.960	
		b) Machinery					
		Water tanker 6 KL capacity	hour	6.000	6.000	6.000	
		c) Material					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Plants	each	200.000	200.000	200.000	
		Shrubs	each	800.000	800.000	800.000	
		Manure	cum	63.640	63.640	63.640	
		sludge/Farm yard manure					
		Pesticide	kg	0.500	0.500	0.500	
		Cost of water	KL	36.000	36.000	36.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per Km = (a+b+c+d+e)					
11.08		(b) Maintenance of flowering plants and shrubs in central verge for one year					
		Unit = km					
		Taking output = one km					
		a) Labour					
		Mate	day	19.418	19.418	19.418	
		Mazdoor	day	485.450	485.450	485.450	
		b) Machinery					
		Water tanker 6 KL capacity	hour	90.000	90.000	90.000	
		c) Material					
		Manure Sludge / farm yard manure at site	cum	10.000	10.000	10.000	
		Cost of water	KL	180.000	180.000	180.000	
		Replacement of casualties @ 10 Percent					
		Plants	each	20.000	20.000	20.000	
		Shrubs	each	80.000	80.000	80.000	
		Pesticides	kg	1.500	1.500	1.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per Km for one year = (a+b+c+d+e)					
11.09	307	Planting of Trees and their Maintenance for one Year					
		Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench,					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		watering, fixing the tree guard and maintaining the plants for one year					
		Unit = Each					
		Taking output = 10 trees					
		a) Labour					
		Mate	day	0.904	0.904	0.904	
		Mazdoor for planting	day	2.660	2.660	2.660	
		Mazdoor for maintenance for one year	day	19.950	19.950	19.950	
		b) Machinery					
		Water tanker 6 KL capacity	hour	2.000	2.000	2.000	
		c) Material					
		Sapling 2 m high 25 mm dia	each	10.000	10.000	10.000	
		Farm yard manure	cum	0.940	0.940	0.940	
		Pesticide	kg	0.500	0.500	0.500	
		Cost of water	KL	12.000	12.000	12.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 trees = a+b+c+d+e					
		Rate per trees = (a+b+c+d+e)/10					
11.10	308	Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Unit = sqm

Taking output = 100 sqm

a) Labour

Mate	day	0.160	0.160	0.160
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Mazdoor	day	3.990	3.990	3.990
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b) Machinery

Water tanker 6	hour	0.500	0.500	0.500
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KL capacity

c) Material

Cost of water	KL	3.000	3.000	3.000
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d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 100 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/100

11.11 308.2

Supply at Site Well

Decayed Farm Yard

Manure

Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking

Unit = cum

Taking output = one cum

a) Material

Cost of well	cum	1.000	1.000	1.000
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decayed farm yard manure duly screened, loading, carriage, unloading and stacking at site

b) Overhead charges @ on (a) @ on (a) @ on (a)

c) Contractor's profit @ on (a+b) @ on (a+b) @ on (a+b)

Rate per cum = (a+b+c)

11.12 308.20

Supply at Site of

Work/ Store-Deoiled

Neem Cake

Supply at site of work/ store-deoiled neem cake duly packed in used gunny bags

Unit = quintal

Taking output = one quintal

a) Cost, carriage,	quintal	1.000	1.000	1.000
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		loading, unloading and stacking in store/site					
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per quintal = a+b+c					
11.13	308.2	Supplying Sludge Supplying sludge duly stacked at site/ store Unit = cum Taking output = one cum					
		a) Cost of sludge including carriage, loading, unloading and stacking at site	cum	1.000	1.000	1.000	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per cum = a+b+c					
11.14	308 & 1300	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground Half brick circular tree guard, in 2nd class brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete Unit = Each Taking output = one tree guard					
		a) Labour					
		Mate	day	0.027	0.027	0.027	
		Mason	day	0.333	0.333	0.333	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	0.333	0.333	0.333	
		b) Material					
		Brick 2nd class including carriage	each	230.000	230.000	230.000	
		Cement mortar 1:6	cum	0.025	0.025	0.025	
		(Rate taken from sub-analysis 21.01 D)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per tree Guard = a+b+c+d					
11.15	308 & 1300	Edging with 2nd Class Bricks, Laid Dry Lengthwise Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres Unit = Metre Taking output= 10 metres					
		a) Labour					
		Mate	day	0.005	0.005	0.005	
		Mason	day	0.067	0.067	0.067	
		Mazdoor	day	0.067	0.067	0.067	
		b) Material					
		Brick 2nd class including carriage	each	50.000	50.000	50.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 metre = a+b+c+d					
		Rate per metre = (a+b+c+d)/ 10					
11.16	Suggestive	Making Tree Guard 53 cm dia and 1.3 m High as per Design from Empty Bitumen Drums Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect

Unit = Each

Taking output = one tree guard

a) Labour

Mate	day	0.012	0.012	0.012
Blacksmith	day	0.200	0.200	0.200
Mazdoor	day	0.093	0.093	0.093

b) Material

Empty bitumen drum	each	1.000	1.000	1.000
MS sheet 50 x 0.5 mm	kg	0.650	0.650	0.650
Rivets 6 mm dia and 10 mm in length	each	22.000	22.000	22.000

d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Rate for each tree guard = a+b+c+d

11.17

Making Tree Guard 53 cm dia and 2 Metre High as per Design from Empty Bitumen Drums

Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects

Unit = Each

Taking output = one tree guard

a) Labour

Mate		0.021	0.021	0.021
Blacksmith	day	0.266	0.266	0.266

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor		0.266	0.266	0.266	
		b) Material					
		Empty bitumen drum	each	1.500	1.500	1.500	
		MS sheet 50 x 0.5 mm	kg	0.650	0.650	0.650	
		Rivets 6 mm dia and 10 mm in length	each	50.000	50.000	50.000	
		MS plate 30 x 3 mm	kg	1.300	1.300	1.300	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate for each tree guard = a+b+c+d					

11.18 Suggestive

Wrought Iron and Mild Steel Welded Work

Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately

Unit = quintal

Taking output = one quintal

a) Labour

Mate	day	0.239	0.239	0.239
Blacksmith/welder for cutting to design and shape and jointing	day	2.660	2.660	2.660
Mazdoor for fixing and helper for Blacksmith/welder	day	3.325	3.325	3.325

b) Material

Angle, tees, channels etc	quintal	1.050	1.050	1.050
Deduct the cost of scrap	quintal	0.050	0.050	0.050
Add 5 Percent of				

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

cost of material
for welding rods
and other welding
accessories

c) **Overhead charges** @ on (a+b) @ on (a+b) @ on (a+b)
d) **Contractor's profit** @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)
Rate per quintal = a+b+c+d

11.19 -Suggestive

Tree Guard with MS Iron

Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects.

Unit = Each

Taking output = one tree guard

a) Labour

Mate	day	0.027	0.027	0.027
Blacksmith	day	0.333	0.333	0.333
Mazdoor	day	0.333	0.333	0.333

b) Material

MS iron 25 x 6 mm	kg	19.200	19.200	19.200
MS iron 25 x 3 mm	kg	9.600	9.600	9.600

Add 5 Percent of cost of material for riveting, bolting and welding accessories

c) Machinery

Tractor-trolley	hour	0.040	0.040	0.040
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d) Painting

Painting two coats including priming	sqm	1.770	1.770	1.770
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Rate for concrete may be adopted

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

vide item no.
8.09

e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)

Rate per tree guard =a+b+c+d+e+f

- The items of excavation and concreting to be measured and paid separately as per design.
- Rate of painting may be adopted from the chapter as Traffic signs.

11.20 Suggestive

Tree Guard with MS Angle Iron and Steel Wire

Providing and fixing
tree guard 0.60 metre
square, 2.00 metre
high fabricated with
MS angle iron 30 x 30
x 3 mm, MS iron 25 x 3
mm and steel wire 3
mm dia welded and
fabricated as per
design in two halves
bolted together

Unit = Each

Taking output = one

a) Labour

Mate	day	0.040	0.040	0.040
Blacksmith	day	0.333	0.333	0.333
Welder	day	0.333	0.333	0.333
Mazdoor	day	0.333	0.333	0.333

b) Material

MS angle 30 x 30 x 3 mm	kg	13.500	13.500	13.500
MS iron 25 x 3 mm	kg	18.000	18.000	18.000
Steel wire 3 mm dia	kg	6.000	6.000	6.000

Add 5 Percent of
cost of material
for riveting,
bolting and
welding
accessories

c) Machinery

Tractor-trolley	hour	0.040	0.040	0.040
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d) Painting

Painting two coats including priming Rate for concrete	sqm	1.500	1.500	1.500
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		may be adopted vide item no. 8.09					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Rate per tree guard = a+b+c+d+e+f					
11.21		Compensatory Afforestation					
		Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering					
		Unit = Hectare					
		Taking output = one hectare					
		a) Labour					
		i) Planting					
		Mate	day	1.330	1.330	1.330	
		Mazdoor	day	33.250	33.250	33.250	
		ii) For Maintenance for one year					
		Mate	day	5.000	5.000	5.000	
		Mazdoor	day	66.500	66.500	66.500	
		b) Machinery					
		Dozer 90 HP @ 1000 sqm/hour	hour	10.000	10.000	10.000	
		Water tanker 6 KL capacity (for planting)	hour	3.000	3.000	3.000	
		Water tanker 6 KL capacity (for maintenance)	hour	25.000	25.000	25.000	
		c) Material					
		Sapling 1 to 1.5 m high 2 cm dia stem	each	290.000	290.000	290.000	
		Add 10 Percent of sapling	each	29.000	29.000	29.000	
		Decayed farm	cum	60.900	60.900	60.900	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		yard/sludge manure (planting)					
		Decayed farm yard/sludge manure (maintenance)	cum	4.000	4.000	4.000	
		Pesticides for planting	kg	0.500	0.500	0.500	
		Pesticides for maintenance	kg	1.500	1.500	1.500	
		Cost of water	KL	18.000	18.000	18.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per hectare = a+b+c+d+e					

Note: Cost of fencing to be provided as per size of plot and approved design, measured and paid separately

11.22

Rain Water Harvesting

Constructing rain water harvesting recharge trench cum recharge shaft / well including grating passage joining storm water drain and trench having brick walls, RCC cover slab and filled with layers of filter media (size 75 mm to 100 mm), grating having brick walls and CC 1:2:4 base and PVC pipe shaft packed with gravel, provided with wire screen and bottom plug complete as per Drawing, direction of the Engineer and MORT&H Specifications sections 300, 1000, 1300, 1500, 1600 & 1700. (Dimension of rain water harvesting pit 6.5 m depth, 2.10 meter inner dia, wall width 375 mm and top slab thickness 150 mm)

Unit = Number

Taking output = 10 Number

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Excavation 12.01 (Rate taken from Item No. - 12.01 (I) B (iii))	Cum	230.213	230.213	230.213	
		Brick Wall (2.5 meter) (Rate taken from Item No. - 12.05)	cum	61.819	61.819	61.819	
		Brick Wall (Without Mortar -4 meter) (Rate taken from Item No. - 12.05 x 83%)		98.910	98.910	98.910	
		RCC M20 for Slab (Rate taken from Item No. - 12.08 C, Case-II)	Cum	5.193	5.193	5.193	
		Reinforcement (Rate taken from Item No. - 12.42)	MT	0.415	0.415	0.415	
		b) Filter Material (Size from 75- 100 mm)	cum	225.020	225.020	225.020	
		c) Add 1 per cent of the cost of (a+b) for other miscellaneous (i.e Pipe etc) activities required to complete the item in all respect.					
		d) Overhead charges		@ on (b)	@ on (b)	@ on (b)	
		e) Contractor's profit		@ on (b)	@ on (b)	@ on (b)	
		Cost for 10 Nos. = a+b+c+d+e Rate per No. = (a+b+c+d+e)/10					

PART- B

BRIDGE WORKS

B. STRUCTURE WORKS

BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

The basic approach for the preparation of Standard Data Book for Bridge Works is indicated as under:

Description of items

The description of items is given briefly and linked with the relevant clause of the MoRT&H Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretation.

Overhead Charges

The overhead charges include the following elements:

- i. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Office furniture, equipment and communications
- iii. Expenditure on
 - Corporate office of contractor
 - Site supervision
 - Documentation and "as built" drawings
- iv. Mobilisation /de-mobilisation of resources
- v. Labour camps with minimum amenities and transportation to work sites
- vi. Light vehicles for site supervision including administrative and managerial requirements
- vii. Laboratory equipment and quality control including field and laboratory testing
- viii. Minor T&P and survey instruments and setting out works, including verification of line, dimensions, trial pits and bore holes, where required
- ix. Temporary Diversion
- x. Watch and ward
- xi. Traffic management during construction
- xii. Expenditure on 'safeguarding environment
- xiii. Sundries
- xiv. Financing Expenditure
- xv. Insurance/compensation

For the purpose of calculation of overhead charges, the bridge projects may be categorized into two basic types as under

Category 1: Bridge / Structure Works	25 percent
Category 2: Rehabilitation of Bridges / Structure	30 percent
Contractor Profit :	10 Percent of cost of works

B. STRUCTURE WORKS

BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

Contractor profit is also added on overhead charges.

Basic Inputs

Basic inputs are only given in the standard data book. The rates for material and labour have to be updated by concerned State/UT govt. Officials like E-in-C, CE(NH), State PWDs.

Plants and Equipment

In the analysis of rates, for any items of work, capacity of equipment with corresponding output has been indicated which is most common in use for estimation purpose. Seeing the volume of job, different capacity equipment with corresponding output as indicated in Chapter-20 can be usage for preparing the estimate.

Materials

The rates of material should include basic cost at crushing units, cost of carriage including loading and unloading and stacking of material at site of work and shall be determined through market enquiries.

Labour

Highly Skilled labour include mason (1st class), carpenter, Blacksmith (1st class)/ Welder/ Plumber/ Electrician, (1st class), mechanics and other trades.

One mate has been provided for 25 labours.

Carriage of Materials

The unit for vehicle for carriage has been taken as under:

- a) In hours where lead is defined including time required for loading and unloading
- b) In tonne· km where lead is variable. The loading and unloading for such cases have been provided separately.

General :

Bridge bearing and expansion joints are ready made items commercially produced by specialized firms and in certain cases using imported technology and parts. The rates of these, items are to be obtained directly from different manufacturers approved by the Ministry and shall be adopted after comparison.

Normal method of curing & with curing compound has been covered in the schedule. Analysis for steam curing has been included in the analysis of pre-cast concrete PSC beams.

The testing of materials and finished items of work is covered under overhead charges.

Traffic arrangements during construction are covered under overhead charges. Provisions of a temporary diversion, where required shall be governed by Clause 112.

In the items for well foundation, provision for nominal island/temporary protection, deep islands/cofferdams with wooden ballies and sheet piles has been made. The sinking of well foundation in bouldery strata has been included.

In the case of pile foundation, pile dia up to 1.5 m is analysed.

The analysis of steel bridges has been incorporated. For innovative type of structures like cable stayed bridges, suspension bridges, arch bridges, bow string girder bridges, erected by innovative techniques where erection stage is as important as the construction of bridge components in terms of input of machinery,

B. STRUCTURE WORKS

BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

manpower and materials, special analysis is called for.

For some of the items, certain size/specifications have been assumed. If size/specifications other than the same are adopted, corresponding modifications may be made in the inputs of analysis.

The items do not cover all components of bridge projects and all situations. There may be specialized items for specific cases, which need to be analysed keeping in view the basic approach.

Guide Bund

The items for the guide bund are excavation, embankment and protection works. The rates for these items may be taken from the respective chapters.

In case bridge construction works are to be done on wide and deep water channels in major rivers or in sea creeks etc., provision of floating barrages. for taking the construction materials and equipment's inside water shall also be made separately.

Analysis for sinking of wells cover diameter; from 6 m to 12 m and Twin D Type of size 12 m x 6 m. For other. Shapes like rectangular or any other size, the rates of sinking may be worked out on pro-rata basis.

The lift for casting of concrete in well staining may be 2 to 2.5 m restricting the free fall of concrete to 1.5 m and concreting layer to 450 mm.

The Standard Data Book is for Department use only. It can not be produced in Court of law as reference/ authority and this is a privilege document.

CHAPTER – 12

BRIDGE FOUNDATION

PREAMBLES:

- 1 Excavation for structures has been provided both by manual and mechanical means. The rate relevant to a particular situation may be adopted.
- 2 The earth excavated from foundation has been proposed to be backfilled and balance quantity utilized for road work locally except for marshy soil where disposal has been provided.
- 3 The rock foundations are required to be prepared which has been analysed.
- 4 In case of rocks, excavation has been considered upto a depth of 3 m only.
- 5 Embedment of foundation in soft and hard rocks has been provided as required by the specifications.
- 6 Dewatering has been provided in excavation for foundation. In case dewatering is not required for a particular site condition, the same may be omitted while preparing the estimate.
- 7 Mixing of cement concrete has been considered only by using batching plant.
- 8 Concrete batching plant is generally placed within one km of the bridge site. In case of longer lead, transportation cost may be worked out based on tonne Km
- 9 The coarse and fine aggregate for cement concrete shall be as per IS: 383.
- 10 Description of items has been given very brief. Relevant clauses of MoRT&H Specifications may be referred for detailed specification.
- 11 The rate analysis for well foundation has been included for diameter varying from 6 m to 12 m. Well for twin D type has also been included.
- 12 Pneumatic sinking is a specialized job. All safety precaution as per IS: 4138 are required to be taken. Medical supervision for such works is considered very essential. Depth of pneumatic sinking has been restricted to 30 m below normal water level.
- 13 Rate analysis for various types of piles like bored cast-in-situ, driven precast RCC pile and driven steel piles of H section have been included. If the steel casting in case of driven pile is required to be retained, the same is required to be priced separately.
- 14 Pile driving rigs including vibratory hammers are assumed to be self contained with power units and necessary accessories required for driving.
- 15 The quantity of concrete which is required to be stripped off upto a minimum height of 600 mm above the designed top level of the pile has been taken into account in the rate analysis.
- 16 The leveling course below the pile cap is proposed with M 15 grade concrete.
- 17 Steel reinforcement for cement concrete works is required to be protected with the steel plates of thickness not less than 10 mm upto top level of well curb. For height above top of curb, the thickness of steel plate may be reduced to 6 mm. This extra height of steel lining should be limited to 3 m.
- 18 Appendix-4 of IRC: 78 may be referred regarding precautions to be taken during sinking of wells.
- 19 In case of blasting during sinking of wells the inner face of the curb is required to be protected with the steel plates of thickness not less than 10 mm upto top level of well curb. For height above top curb, the thickness of steel plate may be reduced to 6 mm. This extra height of steel lining should be limited to 3 m.
- 20 The concrete mix used in bottom plug shall have minimum cement content of 330 kg/cum and a slump of about 150 mm to permit easy flow of concrete through tremie to fill-up all cavities.

CHAPTER – 12

BRIDGE FOUNDATION

- 21 Necessary safety precautions shall be taken for excavation on open foundations for which guidance may be taken from IS: 3764.
- 22 A leveling course of 100 mm thickness in M 10 shall be provided before laying open foundations.
- 23 In case of open foundation, dewatering shall not be permitted from the time of placing concrete upto 24 hours after placement.
- 24 In case of open foundations in rock, the trenches around the footing shall be filled-up with concrete of M 15 grade upto a level of 0.6 m for hard rock and 1.5 m for soft rock above the foundation level. The portion above this may be filled by boulders grouted with cement.
- 25 When there are two or more compartments in a well, the lower edge of the cutting edge of the middle stems of such wells shall be kept about 300 mm above that of outer stems to prevent rocking.
- 26 The well curb shall be in RCC of mix not leaner than M 25 grade with minimum steel reinforcement of 72 kg/cum excluding bond rods.
- 27 The top of the bottom plug shall be at least 300 mm above top of curb.
- 28 No dewatering shall be carried out within 7 days of casting of bottom plug.
- 29 In case of cement concrete piles, the minimum grade of concrete shall be M 35 with minimum cement content of 400 kg/cum.
- 30 The top of the pile shall project 50 mm into the pile cap and reinforcement of pile shall be fully anchored in pile cap.
- 31 The minimum thickness of pile cap should be at least 0.6 m or 1.5 times the diameter of the pile whichever is more.
- 32 Guidance for piles is to be obtained from IS: 2911.
- 33 Concrete in driven cast-in-situ piles shall be cast upto a minimum height of 600 mm above the designed top level of pile, which shall be stripped off to obtain sound concrete either before final set or after 3 days.

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.01	304	Excavation for Structures Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.					
		I Ordinary soil Unit = cum Taking output = 10 cum					
		A Manual Means (i) Depth upto 3 m					
		a) Labour					
		Mate	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note 1. Cost of dewatering may be added where required upto, 10 Percent of labour cost Assessment for dewatering shall be made as per site conditions. 2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 12.01 excluding marshy soil. 3. The cost of shoring and shuttering, where needed, may be added @ 1 Percent on cost of excavation for open foundation.					
12.01		(ii) Depth 3 m to 6 m					
(I) A		a) Labour					
		Mate/Supervisor	day	0.239	0.239	0.239	
		Mazdoor	day	5.985	5.985	5.985	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note Cost of dewatering may be added where required upto 15 Percent of labour cost. Assessment for dewatering shall be done as per actual ground conditions.					
12.01		(iii) Depth above 6 m					
(I) A		a) Labour					
		Mate/Supervisor	day	0.319	0.319	0.319	
		Mazdoor	day	7.980	7.980	7.980	

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

b) Overhead charges	@ on (a)	@ on (a)	@ on (a)
c) Contractor's profit	@ on (a+b)	@ on (a+b)	@ on (a+b)

Cost for 10 cum = a+b+c
Rate per cum = (a+b+c)/10

Note 1. Cost of dewatering may be added where required upto 20 Percent of labour cost. Assessment for dewatering shall be made as per site conditions..

12.01
(I)

B Mechanical Means

Depth upto 3 m

Unit = cum

Taking output = 330 cum

a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor	day	10.640	10.640	10.640

b) Machinery

Hydraulic Excavator

For excavation

(i) 1.2 cum bucket capacity	hour	5.508		
(ii) 1.1 cum bucket capacity	hour		6.344	
(iii) 0.9 cum bucket capacity	hour			8.869

For backfilling (considering 60% of the excavated material)

(i) 1.2 cum bucket capacity	hour	3.305		
(ii) 1.1 cum bucket capacity	hour		3.806	
(iii) 0.9 cum bucket capacity	hour			5.321

Tipper for transportation

of excess material to dumping yard considering lead @ 1 km

(i) 18 cum capacity	t-km	198.000		
(ii) 14 cum capacity	t-km		198.000	
(iii) 10 cum capacity	t-km			198.000

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Cost for 330 cum = a+b+c+d
Rate per cum = (a+b+c+d)/330

Note Cost of dewatering upto 5 Percent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions.

(ii) Depth 3 m to 6 m

Unit = cum

Taking output = 300 cum

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	5.564			
		(ii) 1.1 cum bucket capacity	hour		6.408		
		(iii) 0.9 cum bucket capacity	hour			8.958	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.338			
		(ii) 1.1 cum bucket capacity	hour		3.845		
		(iii) 0.9 cum bucket capacity	hour			5.375	
		Tipper for transportation					
		of excess material to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/300					

Note Cost of dewatering upto 7.5 Percent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..

(iii) Mechanical Means (Depth above 6 m)

Unit = cum

Taking output = 270 cum

a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor	day	10.640	10.640	10.640

b) Machinery

Hydraulic Excavator

For excavation

(i) 1.2 cum bucket capacity	hour	5.634		
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		6.488		
		(iii) 0.9 cum bucket capacity	hour			9.070	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.380			
		(ii) 1.1 cum bucket capacity	hour		3.893		
		(iii) 0.9 cum bucket capacity	hour			5.442	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t-km	162.000			
		(ii) 14 cum capacity	t-km		162.000		
		(iii) 10 cum capacity	t-km			162.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 270 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/270					

- Note**
1. Cost of dewatering upto 10 Percent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions.
 2. Labour provided for excavation by mechanical means includes that required for trimming of bottom and side slopes.

12.01

II Ordinary Rock (not requiring blasting)

A Manual Means

(i) Depth upto 3 m

Unit = cum

Taking output = 10 cum

a) Labour

Mate	day	0.266	0.266	0.266
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Mazdoor	day	6.650	6.650	6.650
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b) Overhead charges		@ on (a)	@ on (a)	@ on (a)
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c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)
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Cost for 10 cum = a+b+c

Rate per cum = (a+b+c)/10

- Note** Cost of dewatering upto 10 Percent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.01 (II)	B	Mechanical Means Unit = cum Taking output = 50 cum a) Labour Mate day 0.160 0.160 0.160 Mazdoor day 3.990 3.990 3.990 b) Machinery Hydraulic Excavator Excavator for excavation (i) 1.2 cum bucket capacity hour 6.926 (ii) 1.1 cum bucket capacity hour 8.149 (iii) 0.9 cum bucket capacity hour 8.658 For loading (i) 1.2 cum bucket capacity hour 1.039 (ii) 1.1 cum bucket capacity hour 1.196 (iii) 0.9 cum bucket capacity hour 1.672 Jack Hammer hour 6.926 8.149 8.658 Tipper For transportation considering lead @ 1km (i) 18 cum capacity t-km 75.000 (ii) 14 cum capacity t-km 75.000 (iii) 10 cum capacity t-km 75.000 For loading & unloading time (i) 18 cum capacity hour 1.039 (ii) 14 cum capacity hour 1.196 (iii) 10 cum capacity hour 1.672 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 50 cum = a+b+c+d Rate per cum = (a+b+c+d)/ 50					
Note 1. Cost of dewatering upto 10 Percent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions. 2. In case of rock, foundation beyond3 m is not dug and hence not included.							
12.01 302	III	Hard Rock (requiring blasting) Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		excavated rock by a dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303					
	A	Manual Means					
		Unit = cum					
		Taking output = 120 cum					
		a) Labour					
		Mate	day	0.279	0.279	0.279	
		Mazdoor	day	3.990	3.990	3.990	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		b) Machinery					
		Air compressor	hour	6.000	6.000	6.000	
		Jack Hammer for drilling holes (@ 4.5 m per hour)	hour	24.000	24.000	24.000	
		Jack Hammer (consider 5% of the volume for dressing)	hour	1.219	1.434	1.524	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	1.219			
		(ii) 1.1 cum bucket capacity	hour		1.434		
		(iii) 0.9 cum bucket capacity	hour			1.524	
		For loading					
		(i) 1.2 cum bucket capacity	hour	2.493			
		(ii) 1.1 cum bucket capacity	hour		2.871		
		(iii) 0.9 cum bucket capacity	hour			4.013	
		Tipper					
		For transportation considering lead @ 1 km					
		(i) 18 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		For loading & unloading time					
		(i) 18 cum capacity	hour	2.493			
		(ii) 14 cum capacity	hour		2.871		
		(iii) 10 cum capacity	hour			4.013	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Materials					
		Small dia.Explosive at 0.40 kg / cum for 120 cum (120 x 0.40)	kg	49.200	49.200	49.200	
		Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (120 x 0.2x5%)					
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos	no	69.000	69.000	69.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes(required for 5% of the total quantity @ 0.6 m per hole for 1 cum)	no	7.000	7.000	7.000	
		Detonating fuse coil	m	213.000	213.000	213.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 120					
		Note					Cost of dewatering @ 10 Percent of (a+b) may be added, where required Assessment for dewatering shall be made as per site conditions.
12.01	IV	Hard Rock (blasting prohibited)					
		Unit = cum					
		Taking output = 35 cum					
	A	Mechanical Means					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Jack Hammer	hour	7.111	8.081	8.889	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	7.111			
		(ii) 1.1 cum bucket capacity	hour		8.081		
		(iii) 0.9 cum bucket capacity	hour			8.889	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.727			
		(ii) 1.1 cum bucket capacity	hour		0.837		
		(iii) 0.9 cum bucket	hour			1.171	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		capacity					
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t-km	52.500			
		(ii) 14 cum capacity	t-km		52.500		
		(iii) 10 cum capacity	t-km			52.500	
		For loading & unloading time					
		(i) 18 cum capacity	hour	0.727			
		(ii) 14 cum capacity	hour		0.837		
		(iii) 10 cum capacity	hour			1.171	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 35 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 35					
		Note					
		1. Cost of dewatering upto 10 Percent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
12.01	V	Marshy Soil					
		Unit = cum					
		Taking output = 10 cum					
		Depth upto 3 m					
	A	Manual means					
		a) Labour					
		Mate/Supervisor	day	0.532	0.532	0.532	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Tractor-trolley for removal.	hour	2.670	2.670	2.670	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 10					
		Note					
		1. Cost of dewatering @ 30 Percent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. Shoring & strutting 15 Percent of (a), where required may be added					
		3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item 12.01 (i) to (iv) for ordinary soil					
12.01 (V)	B	Mechanical Means					
		Unit = cum					
		Taking output = 260 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	10.126			
		(ii) 1.1 cum bucket capacity	hour		11.662		
		(iii) 0.9 cum bucket capacity	hour			16.304	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t-km	390.000			
		(ii) 14 cum capacity	t-km		390.000		
		(iii) 10 cum capacity	t-km			390.000	
		For loading & unloading time					
		(i) 18 cum capacity	hour	10.126			
		(ii) 14 cum capacity	hour		11.662		
		(iii) 10 cum capacity	hour			16.304	
		c) Material					
		Selected earth for refilling	cum	156.000	156.000	156.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 260 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 260					
		Note					
		1. Cost of dewatering @ 20 Percent of (a+b) may be added, where required					
		2. Shoring & strutting @ 10 Percent of (a+b), where required may be added					
		3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item 12.01 (i) to (iv) for ordinary soil					
12.01 (VI)	VI	Back Filling in Marshy Foundation Pits					
		Unit = Cum					
		Taking Output = 6 cum					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor for dressing sides, bottom and backfilling	day	3.990	3.990	3.990	
		b) Machinery					
		Tractor-trolley for transportation	hour	2.000	2.000	2.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 6 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/6					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.02	304	Filling Annular Space Around Footing in Rock Unit = cum Taking out put = 1 cum Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per item 12.04.					
12.03	304	Sand Filling in Foundation Trenches as per Drawing & Technical Specification Unit = cum Taking output = 100 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.75			
		(ii) 12 KL capacity	hour		0.333 x L1 + 1		
		(iii) 6 KL capacity	hour			0.667 x L1 + 2	
		c) Material					
		Sand (assuming 20 Percent voids) at site	cum	120.000	120.000	120.000	
		Water	KL	18.000	18.000	18.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per 100 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 100					
12.04	2100	PCC 1:3:6 in Foundation Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days. Unit = cum Taking output = 15 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	9.310	9.310	9.310	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Plain cement concrete 1:3:6 nominal mix using batching plant (Rate taken from sub-analysis 21.02)	cum	15.000	15.000	15.000	
		Water	KL	3.240	3.240	3.240	
		c) Machinery					
		Plate Compactor	hour	1.000	1.000	1.000	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.045 x L1 + 0.135			
		(ii) 12 KL capacity	hour		0.06 x L1 + 0.18		
		(iii) 6 KL capacity	hour			0.12 x L1 + 0.36	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/ 15					

Note Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.

12.05	1300	Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications. Unit = cum Taking output = 5 cum					
		a) Material					
		Bricks 1st class	each	2500.000	2500.000	2500.000	
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	1.200	1.200	1.200	
		Water for curing	KL	2.415	2.415	2.415	
		b) Labour					
		Mate	day	0.638	0.638	0.638	
		Mason	day	5.320	5.320	5.320	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.034 x L1 + 0.101			
		(ii) 12 KL capacity	hour		0.045 x L1 + 0.134		
		(iii) 6 KL capacity	hour			0.089 x L1 + 0.268	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
12.06	Sub-analysis	(A) Cement Mortar 1:3 (1 cement : 3 sand) Unit = cum Taking output = 1 cum Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	Cum	1.000	1.000	1.000	
		(B) Cement Mortar 1:2 (1 cement : 2 sand) Unit = cum Taking output = 1 cum Cement mortar 1:2 (Rate taken from sub-analysis 21.01 B)	Cum	1.000	1.000	1.000	
		(C) Cement Mortar 1:4 (1 cement : 4 sand) Unit = cum Taking output = 1 cum Cement mortar 1:4 (Rate taken from sub-analysis 21.01 C)	Cum	1.000	1.000	1.000	
		(D) Cement Mortar 1:4 (1 cement : 4 sand) Unit = cum Taking output = 1 cum Cement mortar 1:4 (Rate taken from sub-analysis 21.01 D)	Cum	1.000	1.000	1.000	
12.07		Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications. Unit = cum Taking output = 5 cum (A) Square Rubble Coursed Rubble Masonry (first sort)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Stone	cum	5.500	5.500	5.500	
		Through and bond stone (35no.x0.24mx0.24mx0.3 9m = 0.79 cu.m)	each	35.000	35.000	35.000	
		Cement mortar 1:3 (Rate taken from sub- analysis 21.01 A)	cum	1.500	1.500	1.500	
		b) Labour					
		Mate	day	0.878	0.878	0.878	
		Mason	day	9.975	9.975	9.975	
		Mazdoor	day	11.970	11.970	11.970	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
		(B) Random Rubble Masonry (coursed/uncoursed) Unit = cum Taking output = 5 cum					
		a) Material					
		Stone	cum	5.500	5.500	5.500	
		Through and bond stone (35nos.x0.24mx0.24mx0. 39m = 0.79 cu.m)	each	35.000	35.000	35.000	
		Cement mortar 1:3 (Rate taken from sub- analysis 21.01 A)	cum	1.550	1.550	1.550	
		b) Labour					
		Mate	day	0.798	0.798	0.798	
		Mason	day	7.980	7.980	7.980	
		Mazdoor	day	11.970	11.970	11.970	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
	Note	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.08	1500, 1700 & 2100	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications. PCC Grade M15 PCC Grade M15 using batching plant & Concrete pump Unit = cum Taking output = 30 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	PCC Grade M15 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/ 15					
12.08	B Case I	PCC Grade M20					
		PCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	30.000	30.000	30.000	
		Water for curing	KL	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	PCC Grade M20 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	15.000	15.000	15.000	
		Water for curing	KL	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	C Case I	RCC Grade M20 RCC Grade M20 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis 21.06)					
		Water for curing	KL	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum	tonne-	75 x L1	75 x L1	75 x L1	
		Capacity)	km				
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer	hour	0.726	0.726	0.726	
		pump					
		Water tanker (speed @					
		10 km/hr. and return					
		speed @ 15 km/hr. and					
		unloading @ 30 mins per					
		trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					
	Case II	RCC Grade M20 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	15.000	15.000	15.000	
		Water for curing	kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/15					
12.08	D Case I	PCC Grade M25 PCC Grade M25 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(Rate taken from sub-analysis 21.06)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		PCC Grade M25 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	E Case I	RCC Grade M25 RCC Grade M25 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	30.000	30.000	30.000	
		Water for curing	kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	RCC Grade M25 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.07)					
		Water for curing	KL	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	F Case I	PCC Grade M30					
		PCC Grade M30 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost cum	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.08)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum tonne-	km	75 x L1	75 x L1	75 x L1	
		Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	Case II	PCC Grade M30 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	G Case I	RCC Grade M30 RCC Grade M30 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum tonne- Capacity)	km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	RCC Grade M30 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	H	RCC Grade M35					
	Case I	RCC Grade M35 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	30.000	30.000	30.000	
		Water for curing	kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		RCC Grade M35 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	15.000	15.000	15.000	
		Water for curing	kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	I Case I	RCC Grade M40					
		RCC Grade M40 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.12)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	Case II	RCC Grade M40 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/15					
12.08	J Case I	RCC Grade M45 RCC Grade M45 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		analysis 21.13)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		5050.000	5060.000	5093.000	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	RCC Grade M45 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.13)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.09	1200	WELL FOUNDATION					
		Providing and Constructing Temporary Island 24 m diameter for Construction of Well Foundation for 8 m dia. Well.					
	A	Assuming depth of water 1.0 m and height of island to be 1.25 m.					
		Unit = No					
		Taking output = 1 No.					
		a) Material					
		Earth (compacted)	cum	565.487	565.487	565.487	
		Sand bags	each	1125.000	1125.000	1125.000	
		b) Labour					
		Mate	day	0.920	0.920	0.920	
		Mazdoor for filling sand bags, stitching and placing	day	23.000	23.000	23.000	
		c) Machinery					
		Crane with grab 1 cum capacity	hour	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Consumables @ 2.5

Percent of (c) above

d) Overhead charges @ on (a+b+c)

e) Contractor's profit @ on (a+b+c+d)

Rate per No. (a+b+c+d+e)

Note It is assumed that earth will be available within the working space of crane with grab bucket.

12.09

B Assuming depth of water 4.0 m and height of island 4.5 m.

Unit = No

Taking output = 1 No

a) Material

Earth (compacted) cum 1356.000 1356.000 1356.000

Sand bags each 9000.000 9000.000 9000.000

Wooden ballies 8" Dia each 143.000 143.000 143.000
and 9 m long

Wooden ballies 2" Dia for metre 285.000 285.000 285.000
bracing

b) Labour

Mate day 8.400 8.400 8.400

Mazdoor for piling 8" dia day 27.000 27.000 27.000
ballies for piling 8" dia
ballies

Mazdoor for bracing with day 18.000 18.000 18.000
2" dia ballies

Mazdoor for filling sand day 165.000 165.000 165.000
bags, stitching and
placing

c) Machinery

Crane with grab 1 cum hour 75.000 75.000 75.000
capacity

Consumables and other
arrangements for piling
ballies @ 2.5 Percent of
(a+b+c).

d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

**e) Contractor's profit @ on @ on @ on
(a+b+c+d) (a+b+c+d) (a+b+c+d)**

Rate per No. (a+b+c+d+e)

Note For other well diameters rate can be worked out on the basis of cross-sectional area of well. The diameter of the island shall be in the conformity with clause 1203.4 of MoRTH specifications.

12.09

C

**Providing and constructing
one span service road to
reach island location from one
pier location to another pier
location**

Assuming span length 30 m,
width of service road 10 m and
depth of water 1 m

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = meter					
		Taking output = 30 metre					
		a) Material					
		Earth	cum	450.000	450.000	450.000	
		Sand bags	each	300.000	300.000	300.000	
		b) Labour					
		Mate	day	0.240	0.240	0.240	
		Mazdoor for filling sand bags, stitching and placing	day	6.000	6.000	6.000	
		c) Machinery					
		Front end Loader 1 cum capacity	hour	27.000	27.000	27.000	
		Tipper 5.5 cum capacity	hour	28.000	28.000	28.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 m (a+b+c+d+e)					
		Rate per m (a+b+c+d+e)/30					
12.10	1200 & 1900	Providing and Laying Cutting Edge of Mild Steel weighing 40 kg per metre for Well Foundation complete as per Drawing and Technical Specification.					
		Unit = MT					
		Taking output = 1.0 MT					
		a) Material					
		Structural steel in plates, angles, etc including 5 Percent wastage	tonne	1.050	1.050	1.050	
		Nuts & bolts	Kg	20.000	20.000	20.000	
		b) Machinery					
		Hydra Crane of capacity 10T for lifting shifting	hour	8.000	8.000	8.000	
		Tipper for Transportation to site					
		(i) 18 cum capacity	t.km	1.05 x L1			
		(ii) 14 cum capacity	t.km		1.05 x L1		
		(iii) 10 cum capacity	t.km			1.05 x L1	
		c) Labour					
		(for cutting, bending, making holes, joining, welding and erecting in position)					
		Mate	day	1.436	1.436	1.436	
		Fitter	day	5.985	5.985	5.985	
		Blacksmith	day	5.985	5.985	5.985	
		Welder	day	5.985	5.985	5.985	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	17.955	17.955	17.955	
		Electrodes, cutting gas and other consumables @ 10 Percent of cost of (a) above					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per MT (a+b+c+d+e)					
12.11	1200, 1500 & 1700	Plain/Reinforced Cement Concrete, in Well Foundation complete as per Drawing and Technical Specification.					
	A	Well curb					
	(i)	RCC M20 Grade					
12.11 A	Case I	RCC Grade M20 using batching plant & Concrete pump					
(i)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.166	0.166	0.166	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category		
				Large	Medium	Small
12.11 A (i)	Case II	RCC Grade M20 using batching plant & manual placing				
		Unit = cum				
		Taking output = 15 cum				
		a) Material				
		Per Cum Basic Cost	cum	15.000	15.000	15.000
		(Rate taken from sub-analysis 21.06)				
		b) Labour				
		For pouring and placing				
		Mate	day	0.479	0.479	0.479
		Mason	day	1.330	1.330	1.330
		Mazdoor	day	10.640	10.640	10.640
		c) Machinery				
		Transit truck agitator				
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
		For unloading	hour	0.833	0.833	0.833
d) Formwork @ 20 Percent						
on cost of concrete i.e. cost of material, labour and machinery						
e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 15 cum = a+b+c+d+e+f				
		Rate per cum = (a+b+c+d+e+f)/15				
12.11 A (ii)	Case I	RCC M25 Grade				
		RCC Grade M25 using batching plant & Concrete pump				
		Unit = cum				
		Taking output = 30 cum				
		a) Material				
		Per Cum Basic Cost	cum	30.000	30.000	30.000
		(Rate taken from sub-analysis 21.07)				
		b) Labour				
		For pouring and placing				
		Mate	day	0.179	0.179	0.179
		Mason	day	1.330	1.330	1.330
		Mazdoor	day	3.143	3.143	3.143
		c) Machinery				
		Transit truck agitator				
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726		
Hydraulic Boom placer pump	hour	0.726	0.726	0.726		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery e) Overhead charges f) Contractor's profit		@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					
12.11 A (ii)	Case II	RCC Grade M25 using batching plant & manual placing Unit = cum Taking output = 15 cum a) Material Per Cum Basic Cost (Rate taken from sub- analysis 21.07) b) Labour For pouring and placing Mate Mason Mazdoor c) Machinery Transit truck agitator For transportation (6 cum Capacity) For unloading d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery e) Overhead charges f) Contractor's profit					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		@ on (a+b+c+d) @ on (a+b+c+d+e)		@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)		
		Cost for 15 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/15					
12.11 A (iii)	Case I	RCC M30 Grade RCC Grade M30 using batching plant & Concrete pump Unit = cum Taking output = 30 cum a) Material Per Cum Basic Cost (Rate taken from sub- analysis 21.09)					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 A (iii)	Case II	RCC Grade M30 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
	Note	If curb concrete is carried out within steel liner, cost of formwork shall be excluded.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 A	(iv)	RCC M35 Grade					
12.11 A	Case I	RCC Grade M35 using batching plant & Concrete pump					
(iv)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.11)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 20 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 A	Case II	RCC Grade M35 using batching plant & manual placing					
(iv)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.11)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

d) **Formwork @ 20 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery

e) **Overhead charges** @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

f) **Contractor's profit** @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

Note If curb concrete is carried out within steel liner, cost of formwork shall be excluded.

12.11 A	(v)	RCC M40 Grade					
12.11 A	Case I	RCC Grade M40 using batching plant & Concrete pump					
(v)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.12)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 20 Percent					
		on cost of concrete i.e.					
		cost of material, labour					
		and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

12.11 A	Case II	RCC Grade M40 using batching plant & manual placing					
(v)		Unit = cum					
		Taking output = 15 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
		Note If curb concrete is carried out within steel liner, cost of formwork shall be excluded.					
12.11	B	Well steining					
	(i)	PCC M15 Grade					
12.11 B	Case I	PCC Grade M15 using batching plant & Concrete pump					
(i)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B (i)	Case II	PCC Grade M15 using batching plant & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.03)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B 12.11 B (ii)	Case I	(ii) PCC M20 Grade PCC Grade M20 using batching plant & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.04)	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B (ii)	Case II	PCC Grade M20 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 B	(iii)	RCC M20 Grade					
12.11 B	Case I	RCC Grade M20 using batching plant & Concrete pump					
(iii)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.06)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B	Case II	RCC Grade M20 using batching plant & manual placing					
(iii)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.06)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B	(iv)	PCC M25 Grade					
12.11 B	Case I	PCC Grade M25 using batching plant & Concrete pump					
(iv)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost					
		(Rate taken from sub- analysis 21.06)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B	Case II	PCC Grade M25 using batching plant & manual placing					
(iv)		Unit = cum					
		Taking output = 15 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B	(v)	RCC M25 Grade					
12.11 B	Case I	RCC Grade M25 using batching plant & Concrete pump					
(v)		Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B (v)	Case II	RCC Grade M25 using batching plant & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B (vi)	(vi)	PCC M30 Grade					
12.11 B (vi)	Case I	PCC Grade M30 using batching plant & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B (vi)	Case II	PCC Grade M30 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 B	(vii)	RCC M30 Grade					
12.11 B	Case I	RCC Grade M30 using batching plant & Concrete pump					
(vii)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.09)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B	Case II	RCC Grade M30 using batching plant & manual placing					
(vii)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.09)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.833	0.833	0.833	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B	(viii)	RCC M35 Grade					
12.11 B	Case I	RCC Grade M35 using batching plant & Concrete pump					
(viii)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost					
		(Rate taken from sub- analysis 21.11)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B	Case II	RCC Grade M35 using batching plant & manual placing					
(viii)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub- analysis 21.11)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B	(ix)	RCC M40 Grade					
12.11 B	Case I	RCC Grade M40 using batching plant & Concrete pump					
(ix)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 B (ix)	Case II	RCC Grade M40 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.12)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
(6 cum Capacity)							
For unloading	hour	0.833	0.833	0.833			
d) Formwork @ 10 Percent							
on cost of concrete i.e. cost of material, labour and machinery							
e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)			
f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)			
Cost for 15 cum = a+b+c+d+e+f							
Rate per cum = (a+b+c+d+e+f)/15							
12.11 C (i)	C (i) Case I	Bottom Plug					
		PCC Grade M20					
		PCC Grade M20 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.04)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
Transit truck agitator							
For transportation	tonne-km	75 x L1	75 x L1	75 x L1			
(6 cum Capacity)							
For unloading	hour	0.726	0.726	0.726			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/30					
Case II		PCC Grade M20 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 C	(ii) Case I	PCC Grade M25					
		PCC Grade M25 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/30					
	Case II	PCC Grade M25 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					
12.11 C	(iii) Case I	PCC Grade M30					
		PCC Grade M30 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/30					
	Case II	PCC Grade M30 using batching plant & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					
12.11 C	(iv) Case I	PCC Grade M35 PCC Grade M35 using batching plant & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.10)	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/30					
	Case II	PCC Grade M35 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.10)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds,					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					
12.11	D	Intermediate plug					
	(i)	Grade M20 PCC					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
12.11 D	Case I	PCC Grade M20 using batching plant & Concrete pump					
(i)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
		Rate for concrete may be adopted vide item no. 12.11 (C) (i)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D	Case II	PCC Grade M20 using batching plant & manual placing					
(i)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
		Rate for concrete may be adopted vide item no. 12.11 (C) (i)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D	(ii)	Grade M25 PCC					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
12.11 D	Case I	PCC Grade M25 using batching plant & Concrete pump					
(ii)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Rate for concrete may be adopted vide item no. 12.11 (C) (ii)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D (ii)	Case II	PCC Grade M25 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.11 (C) (ii)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D	(iii)	Grade M30 PCC Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
12.11 D (iii)	Case I	PCC Grade M30 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.11 (C) (iii)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D (iii)	Case II	PCC Grade M30 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.11 (C) (iii)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11	E	Top plug					
	(i)	Grade M15 PCC Same as Item 12.8(a) excluding formwork					
12.11 E	Case I	PCC Grade M15 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (A)					
(i)		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 E	Case II	PCC Grade M15 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (A)					
(i)		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 E	(ii)	Grade M20 PCC Same as Item 12.8(b) excluding formwork					
12.11 E	Case I	PCC Grade M20 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (B)					
(ii)		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 E	Case II	PCC Grade M20 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (B)					
(ii)							

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 E	(iii)	Grade M25 PCC Same as Item 12.8 (d) excluding formwork					
12.11 E (iii)	Case I	PCC Grade M25 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (D)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 E (iii)	Case II	PCC Grade M25 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (D)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 E	(iv)	Grade M30 PCC Same as Item 12.8(f) excluding formwork					
12.11 E (iv)	Case I	PCC Grade M30 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (F)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 E (iv)	Case II	PCC Grade M30 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (F) d) Overhead charges @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) Rate per cum = (a+b+c+d+e)					
12.11	F (i) Case I	Well cap RCC Grade M20 RCC Grade M20 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 15 cum a) Material Per Cum Basic Cost cum 30.000 (Rate taken from sub-analysis 21.06) Water for curing KI 15.750 b) Labour For pouring and placing Mate day 0.206 Mason day 1.995 Mazdoor day 3.143 c) Machinery Transit truck agitator For transportation tonne-km 75 x L1 (6 cum Capacity) For unloading hour 0.726 Hydraulic Boom placer pump Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip) (i) 16 KL capacity hour 0.219 x L1 + 0.656 (ii) 12 KL capacity hour 0.292 x L1 + 0.875 (iii) 6 KL capacity hour 0.583 x L1 + 1.75 d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	RCC Grade M20 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.06)					
		Water for curing	kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 F	(ii)	RCC Grade M25					
12.11 F	Case I	RCC Grade M25 using batching plant transit mixer & Concrete pump					
(ii)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.07)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F	Case II	RCC Grade M25 using batching plant transit mixer & manual placing					
(iii)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.07)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 F	(iii)	RCC Grade M30					
12.11 F	Case I	RCC Grade M30 using					
(iii)		batching plant transit mixer &					
		Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F (iii)	Case II	RCC Grade M30 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	15.000	15.000	15.000	
		Water for curing	kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 F	(iv)	RCC Grade M35					
12.11 F	Case I	RCC Grade M35 using					
(iv)		batching plant transit mixer &					
		Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.11)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F (iv)	Case II	RCC Grade M35 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost cum	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.11)					
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 F	(v)	RCC Grade M40					
12.11 F	Case I	RCC Grade M40 using batching plant transit mixer & Concrete pump					
(v)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.12)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F	Case II	RCC Grade M40 using batching plant transit mixer & manual placing					
(v)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.12)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 F	(vi) Case I	RCC Grade M45					
		RCC Grade M45 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.13)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F (vi)	Case II	RCC Grade M45 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.13)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.12	Section 1200	Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level. Unit = Running Meter Taking output = 1 m Diameter of well - 6 m. A Sandy Soil (i) Depth below bed level upto 3.0 M Rate of sinking = 0.50 m per hour.					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Sinker (skilled)	day	1.330	1.330	1.330	
		Sinking helper (semi-skilled)	day	2.660	2.660	2.660	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	2.000	2.000	2.000	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.12 A	(ii)	Beyond 3m upto 10m depth Rate of sinking = 0.33 m per hour.					
	a)	Labour					
		Mate	day	0.200	0.200	0.200	
		Sinker	day	1.663	1.663	1.663	
		Sinking helper (semi-skilled)	day	3.325	3.325	3.325	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.000	3.000	3.000	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.12 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.12 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.12	B	Clayey Soil (6m dia. Well) Unit = Running Meter. Taking output = 1 meter					
	(i)	Depth below bed level upto 3.0 M Rate of sinking = 0.33 m per hour.					
	a)	Labour					
		Mate	day	0.200	0.200	0.200	
		Sinker (skilled)	day	1.995	1.995	1.995	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.000	3.000	3.000	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
		a) Labour					
		Mate	day	0.399	0.399	0.399	
		Sinker	day	3.990	3.990	3.990	
		Sinking helper (semi-skilled)	day	5.985	5.985	5.985	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	2.000	2.000	2.000	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.12 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering of the cost, if required					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.12 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour)					
12.12	C	Extra over item no. 12.12 (A) or (B) irrespective of depth for sinking in Soft Rock (6m dia well) Unit = Running Meter Taking output = 1 m					
	a)	Labour					
		Mate	day	0.652	0.645	0.645	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.500	0.500	
		Mazdoor	day	10.640	10.640	10.640	
	b)	Machinery					
		Air Compressor 250 cfm	hour	28.274	28.274	28.274	
		Pneumatic breaker	hour	56.549	56.549	56.549	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12	D	Extra over item no. 12.12 (A) or (B) irrespective of depth for sinking in Hard Rock (6m dia well) Unit = Running Meter Taking output = 1 m					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Small dia.Explosive at 0.20 kg / cum	kg	5.655	5.655	5.655	
		Electric detonators	no	25.000	25.000	25.000	
		Detonating fuse coil	m	78.000	78.000	78.000	
		b) Labour					
		Mate	day	0.665	0.665	0.665	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	7.980	7.980	7.980	
		c) Machinery					
		Air Compressor 250 cfm	hour	26.590	26.590	26.590	
		Pneumatic breaker	hour	22.619	22.619	22.619	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	14.561	14.561	14.561	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.12	E	Extra over item no. 12.12 (A) or (B) irrespective of depth for sinking in rock bouldery strata (6m dia well)					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.545	0.545	0.545	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	7.980	7.980	7.980	
		b) Machinery					
		Air Compressor 250 cfm	hour	47.124	47.124	47.124	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic breaker Consumables in sinking @ 5 Percent of (b) Add for dewatering @ of 15 Percent of (a+b), if required	hour	94.248	94.248	94.248	
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13	Section 1200	Sinking of 7 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level. Unit = Running Meter. Taking output = 1 m Diameter of well - 7 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M Rate of sinking = 0.30 m per hour.					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Sinker (skilled)	day	1.663	1.663	1.663	
		Sinking helper (semi- skilled)	day	3.325	3.325	3.325	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	3.250	3.250	3.250	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.13 A	(ii)	Beyond 3m upto 10m depth Rate of sinking = 0.22 m per hour.					
	a)	Labour					
		Mate	day	0.239	0.239	0.239	
		Sinker	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	3.990	3.990	3.990	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.500	4.500	4.500	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.13 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.13 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.13	B	Clayey Soil (7m dia. Well) Unit = Running Meter. Taking output = 1 cum					
	(i)	Depth below bed level upto 3.0 M Rate of sinking = 0.22 m per hour.					
	a)	Labour					
		Mate	day	0.239	0.239	0.239	
		Sinker (skilled)	day	1.995	1.995	1.995	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	3.990	3.990	3.990	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.500	4.500	4.500	
		Consumables in sinking @ 10 Percent of (b)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d)					
12.13 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
		a) Labour					
		Mate	day	0.319	0.319	0.319	
		Sinker	day	2.660	2.660	2.660	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.250	3.250	3.250	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.13 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.13 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.13	C	Extra over item no. 12.13 (A) or (B) irrespective of depth for sinking in Soft Rock (7m dia well) Unit = Running Meter. Taking output = 1 m					
	a)	Labour					
		Mate	day	0.758	0.758	0.758	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	13.300	13.300	13.300	
	b)	Machinery					
		Air Compressor 250 cfm	hour	38.485	38.485	38.485	
		Pneumatic breaker	hour	76.969	76.969	76.969	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13	D	Extra over item no. 12.13 (A) or (B) irrespective of depth for sinking in Hard Rock (7m dia well) Unit = Running Meter Taking output = 1 m					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Small dia.Explosive at 0.20 kg / cum	kg	7.697	7.697	7.697	
		Electric detonators	no	36.000	36.000	36.000	
		Detonating fuse coil	m	112.000	112.000	112.000	
		b) Labour					
		Mate	day	0.771	0.771	0.771	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Air Compressor 250 cfm	hour	33.304	33.304	33.304	
		Pneumatic breaker	hour	30.788	30.788	30.788	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	19.820	19.820	19.820	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.13	E	Extra over item no. 12.13 (A) or (B) irrespective of depth for sinking in rock bouldery strata (7m dia well)					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.652	0.652	0.652	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	10.640	10.640	10.640	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Air Compressor 250 cfm	hour	64.141	64.141	64.141	
		Pneumatic breaker	hour	128.282	128.282	128.282	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14	Section 1200	Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter.					
		Taking output = 1 m					
		Diameter of well - 8 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		a) Labour					
		Mate	day	0.239	0.239	0.239	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	3.990	3.990	3.990	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.000	4.000	4.000	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.14 A	(ii)	Beyond 3m upto 10m depth Rate of sinking @ 0.20 m/hour					
	a)	Labour					
		Mate	day	0.279	0.279	0.279	
		Sinker	day	2.328	2.328	2.328	
		Sinking helper (semi-skilled)	day	4.655	4.655	4.655	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.000	5.000	5.000	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.14 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.14 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.14	B	Clayey Soil (8m dia. Well) Unit = Running Meter. Taking output = 1 meter					
	(i)	Depth from bed level upto 3.0 M Rate of sinking @ 0.18 m/hour					
	a)	Labour					
		Mate	day	0.293	0.293	0.293	
		Sinker (skilled)	day	2.660	2.660	2.660	
		Sinking helper (semi-skilled)	hour	4.655	4.655	4.655	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.		5.500	5.500	5.500	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Sinker	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	5.985	5.985	5.985	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.500	3.500	3.500	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.14 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.14 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.14	C	Extra over item no. 12.14 (A) or (B) irrespective of depth for sinking in Soft Rock (8 m dia well) Unit = Running Meter. Taking output = 1 m					
	a) Labour						
		Mate	day	0.865	0.865	0.865	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	15.960	15.960	15.960	
	b) Machinery						
		Air Compressor 250 cfm	hour	50.265	50.265	50.265	
		Pneumatic breaker	hour	100.531	100.531	100.531	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14	D	Extra over item no. 12.14 (A) or (B) irrespective of depth for sinking in Hard Rock (8 m dia well) Unit = Running Meter Taking output = 1 m					
	a) Material						
		Small dia.Explosive at 0.20 kg / cum	kg	10.053	10.053	10.053	
		Electric detonators	no	50.000	50.000	50.000	
		Detonating fuse coil	m	155.000	155.000	155.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		Mate	day	0.878	0.878	0.878	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	13.300	13.300	13.300	
		c) Machinery					
		Air Compressor 250 cfm	hour	41.050	41.050	41.050	
		Pneumatic breaker	hour	40.212	40.212	40.212	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	25.887	25.887	25.887	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.14	E	Extra over item no. 12.14 (A) & (B) irrespective of depth for sinking in rock bouldery strata (8 m dia well)					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.758	0.758	0.758	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Air Compressor 250 cfm	hour	83.776	83.776	83.776	
		Pneumatic breaker	hour	167.552	167.552	167.552	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15	Section 1200	Sinking of 9 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter.					
		Taking output = 1 m					
		Diameter of well - 9 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		a) Labour					
		Mate	day	0.253	0.253	0.253	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	4.323	4.323	4.323	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.000	4.000	4.000	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.18 m/hour					
		a) Labour					
		Mate	day	0.306	0.306	0.306	
		Sinker	day	2.328	2.328	2.328	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. Consumables in sinking @10 Percent of (b)	hour	5.500	5.500	5.500	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.15 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.15 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.15	B	Clayey Soil (9m dia. Well)					
		Unit = Running Meter.					
		Taking output = 1 cum					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.17 m / hour					
	a)	Labour					
		Mate	day	0.319	0.319	0.319	
		Sinker (skilled)	day	2.993	2.993	2.993	
		Sinking helper (semi-skilled)	day	4.988	4.988	4.988	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.750	5.750	5.750	
		Consumables in sinking					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		@ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.15 m / hour					
	a)	Labour					
		Mate	day	0.399	0.399	0.399	
		Sinker	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	6.650	6.650	6.650	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.500	6.500	6.500	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.750	3.750	3.750	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.15 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.15 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b Add 5 Percent of cost for dewatering, if required c Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.15	C	Extra over item no. 12.15 (A) or (B) irrespective of depth for sinking in Soft Rock (9 m dia well) Unit = Running Meter. Taking output = 1 m					
		a) Labour					
		Mate	day	0.971	0.971	0.971	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	18.620	18.620	18.620	
		b) Machinery					
		Air Compressor 250 cfm	hour	63.617	63.617	63.617	
		Pneumatic breaker	hour	127.235	127.235	127.235	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15	D	Extra over item no. 12.15 (A) or (B) irrespective of depth for sinking in Hard Rock (9 m dia well) Unit = Running Meter Taking output = 1 m					
		a) Material					
		Small dia.Explosive at 0.20 kg / cum	kg	12.723	12.723	12.723	
		Electric detonators	no	65.000	65.000	65.000	
		Detonating fuse coil	m	202.000	202.000	202.000	
		b) Labour					
		Mate	day	0.984	0.984	0.984	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	15.960	15.960	15.960	
		c) Machinery					
		Air Compressor 250 cfm	hour	49.828	49.828	49.828	
		Pneumatic breaker	hour	50.894	50.894	50.894	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	32.763	32.763	32.763	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.15	E	Extra over item no. 12.15 (A) or (B) irrespective of depth for sinking in rock bouldery strata (9 m dia well)					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.865	0.865	0.865	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	15.960	15.960	15.960	
		b) Machinery					
		Air Compressor 250 cfm	hour	106.029	106.029	106.029	
		Pneumatic breaker	hour	212.058	212.058	212.058	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.16	1200	Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level. Unit = Running Meter Taking output = 1 m Diameter of well - 10 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M Rate of sinking 0.20 m / hour					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	4.655	4.655	4.655	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.000	5.000	5.000	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.16 A	(ii)	Beyond 3m upto 10m depth Rate of sinking 0.17 m / hour					
		a) Labour					
		Mate	day	0.333	0.333	0.333	
		Sinker	day	2.660	2.660	2.660	
		Sinking helper (semi-skilled)	day	5.653	5.653	5.653	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.750	5.750	5.750	
		Consumables in sinking @10 Percent of (b)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.16 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.16 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.16 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.16	B	Clayey Soil (10m dia. Well)					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 cum</i>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.18m/hour.					
	a)	Labour					
		Mate	day	0.426	0.426	0.426	
		Sinker (skilled)	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	7.315	7.315	7.315	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.16 B	(ii)	Beyond 3m upto 10m depth Rate of sinking 0.15m/hour.					
	a)	Labour					
		Mate	day	0.452	0.452	0.452	
		Sinker	day	3.990	3.990	3.990	
		Sinking helper (semi-skilled)	day	7.315	7.315	7.315	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.000	4.000	4.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.16 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.16 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.16 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.16	C	<p>Extra over item no. 12.16 (A) or (B) irrespective of depth for sinking in Soft Rock (10 m dia well)</p> <p>Unit = Running Meter.</p> <p>Taking output = 1 m</p> <p>a) Labour</p> <p>Mate day 1.077 1.077 1.077</p> <p>Sinker (skilled) day 1.995 1.995 1.995</p> <p>Sinking helper (semi-skilled) day 2.993 2.993 2.993</p> <p>Diver day 0.665 0.665 0.665</p> <p>Mazdoor day 21.280 21.280 21.280</p> <p>b) Machinery</p> <p>Air Compressor 250 cfm hour 78.540 78.540 78.540</p> <p>Pneumatic breaker hour 157.080 157.080 157.080</p> <p>Consumables in sinking @ 5 Percent of (b)</p> <p>Add for dewatering @ of 15 Percent of (a+b), if required</p> <p>Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories. hour 3.000 3.000 3.000</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Rate per metre = (a+b+c+d)</p>					
12.16	D	<p>Extra over item no. 12.16 (A) or (B) irrespective of depth for sinking in Hard Rock (10 m dia well)</p> <p>Unit = Running Meter</p> <p>Taking output = 1 m</p> <p>a) Material</p> <p>Small dia.Explosive at 0.20 kg / cum kg 15.708 15.708 15.708</p> <p>Electric detonators no 82.000 82.000 82.000</p> <p>Detonating fuse coil m 255.000 255.000 255.000</p> <p>b) Labour</p> <p>Mate day 1.091 1.091 1.091</p> <p>Sinker (skilled) day 1.995 1.995 1.995</p> <p>Sinking helper (semi-skilled) day 2.993 2.993 2.993</p> <p>Diver day 0.665 0.665 0.665</p> <p>Driller day 2.660 2.660 2.660</p> <p>Blaster day 0.333 0.333 0.333</p> <p>Mazdoor day 18.620 18.620 18.620</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Air Compressor 250 cfm	hour	59.640	59.640	59.640	
		Pneumatic breaker	hour	62.832	62.832	62.832	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	40.448	40.448	40.448	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.16	E	Extra over item no. 12.16 (A) or (B) irrespective of depth for sinking in rock bouldery strata (10 m dia well)					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.971	0.971	0.971	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	18.620	18.620	18.620	
		b) Machinery					
		Air Compressor 250 cfm	hour	130.900	130.900	130.900	
		Pneumatic breaker	hour	261.799	261.799	261.799	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.17	1200	<p>Sinking of 11 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.</p> <p>Unit = Running Meter</p> <p>Taking output = 0.50 m</p> <p>Diameter of well - 11 m.</p>					
	A	Sandy Soil					
	(i)	<p>Depth from bed level upto 3.0 M</p> <p>Rate of sinking @ 0.15 m/hour</p> <p>a) Labour</p> <p>Mate day 0.255 0.255 0.255</p> <p>Sinker (skilled) day 1.995 1.995 1.995</p> <p>Sinking helper (semi-skilled) day 4.389 4.389 4.389</p> <p>b) Machinery</p> <p>Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. hour 6.000 6.000 6.000</p> <p>Consumables in sinking @10 Percent of (b)</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 0.5m = a+b+c+d</p> <p>Rate per metre = (a+b+c+d)/0.50</p>					
12.17 A	(ii)	<p>Beyond 3m upto 10m depth</p> <p>Rate of sinking @ 0.13 m/hour</p> <p>a) Labour</p> <p>Mate day 0.346 0.346 0.346</p> <p>Sinker day 2.660 2.660 2.660</p> <p>Sinking helper (semi-skilled) day 5.985 5.985 5.985</p> <p>b) Machinery</p> <p>Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. hour 4.000 4.000 4.000</p> <p>Consumables in sinking @10 Percent of (b)</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 0.5m = a+b+c+d</p> <p>Rate per metre = (a+b+c+d)/0.50</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.17 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.17 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.17 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.17	B	Clayey Soil (11 m dia. Well)					
		Unit = Running Meter					
		Taking output = 0.50 meter					
	(i)	Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.10 m/hour					
	a)	Labour					
		Mate	day	0.346	0.346	0.346	
		Sinker (skilled)	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.000	5.000	5.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.5m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.50					
12.17 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.08 m/hour					
	a)	Labour					
		Mate	day	0.452	0.452	0.452	
		Sinker	day	4.655	4.655	4.655	
		Sinking helper (semi-skilled)	day	6.650	6.650	6.650	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. Air compressor with pneumatic chisel attachment for cutting hard clay Consumables in sinking @ 10 Percent of (b)	hour	6.000	6.000	6.000	
			hour	4.250	4.250	4.250	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.5m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.50					
12.17 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.17 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.17 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.17	C	Extra over item no. 12.17 (A) or (B) irrespective of depth for sinking in Soft Rock (11 m dia well) Unit = Running Meter. Taking output = 1 m					

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	1.184	1.184	1.184	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	23.940	23.940	23.940	
		b) Machinery					
		Air Compressor 250 cfm	hour	95.033	95.033	95.033	
		Pneumatic breaker	hour	190.066	190.066	190.066	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.17	D	Extra over item no. 12.17 (A) or (B) irrespective of depth for sinking in Hard Rock (11 m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					
		a) Material					
		Small dia.Explosive at 0.20 kg / cum	kg	19.007	19.007	19.007	
		Electric detonators	no	101.000	101.000	101.000	
		Detonating fuse coil	m	314.000	314.000	314.000	
		b) Labour					
		Mate	day	1.197	1.197	1.197	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	21.280	21.280	21.280	
		c) Machinery					
		Air Compressor 250 cfm	hour	70.484	70.484	70.484	
		Pneumatic breaker	hour	76.027	76.027	76.027	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	48.942	48.942	48.942	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Consumables in protected blasting @ 10 Percent of (c) Add for dewatering @ of 15 Percent of (a+b+c), if required Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.17	E	Extra over item no. 12.17 (A) or (B) irrespective of depth for sinking inrock bouldery strata (11 m dia well) Unit = Running Meter. Taking output = 1 m					
		a) Labour					
		Mate	day	1.077	1.077	1.077	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	21.280	21.280	21.280	
		b) Machinery					
		Air Compressor 250 cfm	hour	158.389	158.389	158.389	
		Pneumatic breaker	hour	316.777	316.777	316.777	
		Consumables in sinking @ 5 Percent of (b) Add for dewatering @ of 15 Percent of (a+b), if required Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.18	1200	Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level. Unit = Running Meter Taking output = 0.25 m Diameter of well - 12 m.					
	A	Sandy Soil					
	(i)	I) Depth below bed level upto 3.0 M Rate of sinking @ 0.05 m/hour					
		a) Labour					
		Mate	day	0.306	0.306	0.306	
		Sinker (skilled)	day	2.328	2.328	2.328	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.25m = a+b+c+d Rate per metre = (a+b+c+d)/0.25					
12.18 A	(ii)	Beyond 3m upto 10m depth Rate of sinking @ 0.038 m/hour					
		a) Labour					
		Mate	day	0.386	0.386	0.386	
		Sinker	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	6.318	6.318	6.318	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.500	6.500	6.500	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.25m = a+b+c+d Rate per metre = (a+b+c+d)/0.25					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.18 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.18 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.18 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.18	B	Clayey Soil (12 m dia. Well) Unit = Running Meter. Taking output = 0.25 meter.					
	(i)	Depth below bed level upto 3.0 M Rate of sinking @ 0.04 m/hour					
	a)	Labour					
		Mate	day	0.399	0.399	0.399	
		Sinker (skilled)	day	3.990	3.990	3.990	
		Sinking helper (semi-skilled)	day	5.985	5.985	5.985	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.250	6.250	6.250	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.25m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.25					
12.18 B	(ii)	Beyond 3m upto 10m depth Rate of sinking @ 0.03 m/hour					
	a)	Labour					
		Mate	day	0.519	0.519	0.519	
		Sinker	day	4.988	4.988	4.988	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	7.980	7.980	7.980	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.330	8.330	8.330	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.500	4.500	4.500	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.25m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.25					
12.18 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.18 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.18 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.18	C	Extra over item no. 12.18 (A) or (B) irrespective of depth for sinking in Soft Rock (12 m dia well) Unit = Running Meter.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 1 m					
		a) Labour					
		Mate	day	1.290	1.290	1.290	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	26.600	26.600	26.600	
		b) Machinery					
		Air Compressor 250 cfm	hour	113.097	113.097	113.097	
		Pneumatic breaker	hour	226.195	226.195	226.195	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.18	D	Extra over item no. 12.18 (A) or (B) irrespective of depth for sinking in Hard Rock (12 m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					
		a) Material					
		Small dia.Explosive at 0.20 kg / cum	kg	22.619	22.619	22.619	
		Electric detonators	no	122.000	122.000	122.000	
		Detonating fuse coil	m	379.000	379.000	379.000	
		b) Labour					
		Mate	day	1.303	1.303	1.303	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	23.940	23.940	23.940	
		c) Machinery					
		Air Compressor 250 cfm	hour	82.361	82.361	82.361	
		Pneumatic breaker	hour	90.478	90.478	90.478	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	58.245	58.245	58.245	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Consumables in protected blasting @ 10 Percent of (c) Add for dewatering @ of 15 Percent of (a+b+c), if required Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.18	E	Extra over item no. 12.18 (A) or (B) irrespective of depth for sinking in rock bouldery strata (12 m dia well) Unit = Running Meter Taking output = 1 m					
		a) Labour					
		Mate	day	1.184	1.184	1.184	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	23.940	23.940	23.940	
		b) Machinery					
		Air Compressor 250 cfm	hour	188.496	188.496	188.496	
		Pneumatic breaker	hour	376.991	376.991	376.991	
		Consumables in sinking @ 5 Percent of (b) Add for dewatering @ of 15 Percent of (a+b), if required Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19	1200	Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level. Unit = Running Meter Taking output = 1 m Dimensions of well. Overall length = 12 m Overall width = 6 m					
	A	Sandy Soil					
	(i)	Depth from bed level upto 3.0 M Rate of sinking @ 0.18 m/hour					
		a) Labour					
		Mate day	0.266	0.266	0.266		
		Sinker (skilled) day	1.663	1.663	1.663		
		Sinking helper (semi-skilled) day	4.988	4.988	4.988		
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. hour	5.500	5.500	5.500		
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19 A	(ii)	Beyond 3m upto 10m depth Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate day	0.293	0.293	0.293		
		Sinker day	1.995	1.995	1.995		
		Sinking helper (semi-skilled) day	5.320	5.320	5.320		
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. hour	5.880	5.880	5.880		
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.19 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.19 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.19 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.19	B	Clayey Soil (Twin D Type Well)					
		Unit = Running Meter					
		Taking output = 1 meter					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.16 m/hour					
	a)	Labour					
		Mate	day	0.346	0.346	0.346	
		Sinker (skilled)	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.250	6.250	6.250	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.15 m/hour					
	a)	Labour					
		Mate	day	0.492	0.492	0.492	
		Sinker	day	4.323	4.323	4.323	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	7.980	7.980	7.980	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.670	6.670	6.670	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.500	4.500	4.500	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.19 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.19 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.19	C	<p>Extra over item no. 12.19 (A) or (B) irrespective of depth for sinking in Soft Rock</p> <p>Unit = Running Meter.</p> <p>Taking output = 1 m</p> <p>a) Labour</p> <p>Mate day 0.971 0.971 0.971</p> <p>Sinker (skilled) day 1.995 1.995 1.995</p> <p>Sinking helper (semi-skilled) day 2.993 2.993 2.993</p> <p>Diver day 0.665 0.665 0.665</p> <p>Mazdoor day 18.620 18.620 18.620</p> <p>b) Machinery</p> <p>Air Compressor 250 cfm hour 64.274 64.274 64.274</p> <p>Pneumatic breaker hour 128.549 128.549 128.549</p> <p>Consumables in sinking @ 5 Percent of (b)</p> <p>Add for dewatering @ of 15 Percent of (a+b), if required</p> <p>Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories. hour 3.000 3.000 3.000</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Rate per metre = (a+b+c+d)</p>					
12.19	D	<p>Extra over item no. 12.19 (A) or (B) irrespective of depth for sinking in Hard Rock</p> <p>Unit = Running Meter</p> <p>Taking output = 1 m</p> <p>a) Material</p> <p>Small dia.Explosive at 0.20 kg / cum kg 12.855 12.855 12.855</p> <p>Electric detonators no 72.000 72.000 72.000</p> <p>Detonating fuse coil m 224.000 224.000 224.000</p> <p>b) Labour</p> <p>Mate day 0.984 0.984 0.984</p> <p>Sinker (skilled) day 1.995 1.995 1.995</p> <p>Sinking helper (semi-skilled) day 2.993 2.993 2.993</p> <p>Diver day 0.665 0.665 0.665</p> <p>Driller day 2.660 2.660 2.660</p> <p>Blaster day 0.333 0.333 0.333</p> <p>Mazdoor day 15.960 15.960 15.960</p> <p>c) Machinery</p> <p>Air Compressor 250 cfm hour 50.260 50.260 50.260</p> <p>Pneumatic breaker hour 51.419 51.419 51.419</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	33.101	33.101	33.101	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.19	E	Extra over item no. 12.19 (A) or (B) irrespective of depth for sinking in rock bouldery strata Unit = Running Meter Taking output = 1 m					
		a) Labour					
		Mate	day	0.865	0.865	0.865	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	15.960	15.960	15.960	
		b) Machinery					
		Air Compressor 250 cfm	hour	107.124	107.124	107.124	
		Pneumatic breaker	hour	214.248	214.248	214.248	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.20	1200	<p>Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant & materials, arrangement for supply of fresh air to working chambers, check valves, exhaust valves, shafts made from steel plates of riveted construction not less than 6 mm thick to withstand an air pressure of 0.50 MPa, controlled blasting of hard rock where required, staircases and 1 m wide landing platforms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause 1208.8 of MoRTH Specifications.</p> <p>Unit = cum</p> <p>Taking output = 5 cum</p> <p>a) Material</p> <p>M35 grade RCC corbel provided for supporting of equipment (Dimensions as per ground conditions). Rate for concrete may be adopted vide item no. 12.08 (F)</p> <p>HYSD bar reinforcement in corbel</p> <p>Blasting material</p> <p>Explosives</p> <p>Electric detonators</p> <p>b) Labour</p> <p>Mate</p> <p>Driller</p> <p>Blaster</p> <p>Mazdoor (for cutting, blasting, cleaning, removal of Material etc.)</p>					
		M35 grade RCC corbel provided for supporting of equipment (Dimensions as per ground conditions). Rate for concrete may be adopted vide item no. 12.08 (F)	Cum	8.000	8.000	8.000	
		HYSD bar reinforcement in corbel	tonne	0.480	0.480	0.480	
		Explosives	Kg	1.500	1.500	1.500	
		Electric detonators	each	6.000	6.000	6.000	
		Mate	day	2.500	2.500	2.500	
		Driller	day	1.330	1.330	1.330	
		Blaster	day	0.665	0.665	0.665	
		Mazdoor (for cutting, blasting, cleaning, removal of Material etc.)	day	39.900	39.900	39.900	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor (Skilled) (for fixation and removal of adopter for air lock, carrying out mechanical and electrical operations and repairs and other skilled jobs.)	day	13.300	13.300	13.300	
		Diver	day	5.320	5.320	5.320	
		Medical Officer	day	0.665	0.665	0.665	
		Para medical personnel	day	1.330	1.330	1.330	
		c) Machinery					
		(i) Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.	hour	6.000	6.000	6.000	
		Induction and deinduction	L.S				
		Erection at site and commissioning	L.S				
		Usage of plant and equipment for pneumatic method of well sinking	hour	6.000	6.000	6.000	
		Air compressor 250 cfm, 2 nos.	hour	12.000	12.000	12.000	
		Hire and running charges of crane of 15 tonne capacity	hour	6.000	6.000	6.000	
		Motorised barge of 20 tonne capacity	hour	6.000	6.000	6.000	
		Boat to carry atleast 20 persons	hour	6.000	6.000	6.000	
		Electric generating set 33 KVA	hour	6.000	6.000	6.000	
		Tipper 10 tonne capacity	hour	6.000	6.000	6.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Cost for 5 cum = a+b+c+d+e
(see notes below)

Rate per cum = (a+b+c+d+e)/5

- Note**
1. The cost of induction, deinduction and erection of equipment shall be divided by the total quantity of pneumatic sinking for all the wells of a particular bridge to arrive at the per cum rate on account of this item.
 2. Cost of pneumatic sinking per cum of individual wells will be added to the cost indicated at (1) above to arrive at the final rate of pneumatic sinking per cum.
 3. The cost of induction and deinduction will depend upon the distance involved for shifting of equipment which may be assessed in individual cases as per actual ground conditions at the time of making of cost estimates.
 4. In case pneumatic sinking is involved on a dry bed, the provision of barge and boat may be omitted.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		5. The necessity and dimensions of the corbel will be as per actual ground conditions.					
		6. Small equipments like welding sets, pumps, vibrators, pneumatic tools, portable lamps, fire extinguishers, hose pipes etc., have not been included as the same are covered as items of minor T&P under overhead charges.					
		7. Depth of sinking shall be restricted to 30 m.					
12.21	1207	Sand Filling in Wells complete as per Drawing and Technical Specifications.					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Sand (assuming 20 Percent voids)	cum	1.200	1.200	1.200	
		b) Labour					
		Mate	day	0.016	0.016	0.016	
		Mazdoor	day	0.399	0.399	0.399	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum (a+b+c+d)					
12.22	1200 & 1900	Providing Steel Liner 10 mm thick for Curbs and 6 mm thick for Steining of Wells including Fabricating and Setting out as per Detailed Drawing.					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		i) Structural steel including 5 Percent wastage	tonne	1.050	1.050	1.050	
		b) Labour					
		Mate	day	1.064	1.064	1.064	
		Fitter	day	5.320	5.320	5.320	
		Blacksmith	day	5.320	5.320	5.320	
		Welder	day	5.320	5.320	5.320	
		Mazdoor	day	10.640	10.640	10.640	
		Electrodes, cutting gas and other consumables @ 5 Percent on cost a (a) above.					
		c) Machinery					
		Hydra Crane of capacity 10T for lifting shifting	hour	8.000	8.000	8.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate for per MT (a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category		
				Large	Medium	Small
12.23	1100 & 1700	<p>Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.</p> <p>Pile diameter-750 mm</p> <p>Unit = meter</p> <p>Taking output = 25 m</p> <p>a) Materials</p> <p>RCC Grade M35 (including additional concreteing of 1m for pile head) Rate for concrete may be adopted vide item no. 12.11 F (iv)</p> <p>Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)</p> <p>Concrete to be cast with a tremie pipe 200mm dia.</p> <p>Bentonite</p> <p>b) Machinery(for boring and construction)</p> <p>Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.</p> <p>Hire and running charges of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc</p> <p>Hire and running charges of Bentonite pump</p> <p>Transit truck agitator</p> <p>For transportation (6 cum Capacity)</p> <p>For unloading</p> <p>Front end loader for removing muck</p> <p>(i) 3.1 Cum Capacity</p> <p>(ii) 2.1 Cum Capacity</p> <p>(iii) 1 Cum Capacity</p>	cum	11.490	11.486	11.486
			kg	574.500	574.322	574.322
			hour	6.000	6.000	6.000
			hour	3.138	3.138	3.138
			hour	6.000	6.000	6.000
			tonne-km	29.07 x L1	29.07 x L1	29.07 x L1
			hour	0.638	0.638	0.638
			hour	0.407		
			hour		0.598	
			hour			1.276

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	0.407			
		(ii) 14 cum capacity	hour		0.598		
		(iii) 10 cum capacity	hour			1.276	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	18.384			
		(ii) 14 cum capacity	t.km		18.378		
		(iii) 10 cum capacity	t.km			18.378	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/25					
12.24	1100, 1600 & 1700	Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m. Pile diameter-1000 mm Unit = meter Taking output = 25 m					
		a) Materials					
		RCC Grade M35 (including additional concreteing of 1m for pile head) Rate for concrete may be adopted vide item no. 12.11 F (iv)	cum	20.420	20.420	20.420	
		Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)					
		Concrete to be cast with a tremie pipe 200mm dia.					
		Bentonite	kg	1021.018	1021.018	1021.018	
		b) Machineryb (for boring and construction)					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.000	6.000	6.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hire and running charges of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc	hour	3.634	3.634	3.634	
		Hire and running charges of Bentonite pump	hour	6.000	6.000	6.000	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	51.05 x L1	51.05 x L1	51.05 x L1	
		For unloading	hour	1.134	1.134	1.134	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	0.724			
		(ii) 2.1 Cum Capacity	hour		1.064		
		(iii) 1 Cum Capacity	hour			2.269	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	0.724			
		(ii) 14 cum capacity	hour		1.064		
		(iii) 10 cum capacity	hour			2.269	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	32.673			
		(ii) 14 cum capacity	t.km		32.673		
		(iii) 10 cum capacity	t.km			32.673	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+d+e					
		Rate per metre (a+b+c+d+e)/25					
12.25	1100 & 1700	Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.					
	A	Pile diameter-1200 mm					
		Unit = meter					
		Taking output = 25 m					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Materials					
		RCC Grade M35 (including additional concreting of 1m for pile head) Rate for concrete may be adopted vide item no. 12.11 F (iv) Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv) Concrete to be cast with a tremie pipe 200mm dia.	cum	29.405	29.405	29.405	
		Bentonite	kg	1470.265	1470.265	1470.265	
		b) Machinery (for boring and construction)					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	7.000	7.000	7.000	
		Hire and running charges of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc	hour	4.134	4.134	4.134	
		Hire and running charges of Bentonite pump	hour	7.000	7.000	7.000	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	73.53 x L1	73.53 x L1	73.53 x L1	
		For unloading	hour	1.634	1.634	1.634	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	1.043			
		(ii) 2.1 Cum Capacity	hour		1.532		
		(iii) 1 Cum Capacity	hour			3.267	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	1.043			
		(ii) 14 cum capacity	hour		1.532		
		(iii) 10 cum capacity	hour			3.267	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	47.048			
		(ii) 14 cum capacity	t.km		47.048		
		(iii) 10 cum capacity	t.km			47.048	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+d+e					
		Rate per metre (a+b+c+d+e)/25					
12.26	1100 & 1700	Pile diameter-1500 mm					
		Unit = meter					
		Taking output = 25 m					
		a) Materials					
		RCC Grade M35	cum	45.946	45.946	45.946	
		(including additional concreteing of 1 m for pile head) Rate for concrete may be adopted vide item no. 12.11 F (iv)					
		Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)					
		Concrete to be cast with a tremie pipe 200 mm dia.					
		Bentonite	kg	2297.290	2297.290	2297.290	
		b) Machinery(for boring and construction)					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	8.000	8.000	8.000	
		Hire and running charges of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc	hour	5.053	5.053	5.053	
		Hire and running charges of Bentonite pump	hour	8.000	8.000	8.000	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	114.86 x L1	114.86 x L1	114.86 x L1	
		For unloading	hour	2.553	2.553	2.553	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	1.629			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 2.1 Cum Capacity	hour		2.393		
		(iii) 1 Cum Capacity	hour			5.105	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	1.629			
		(ii) 14 cum capacity	hour		2.393		
		(iii) 10 cum capacity	hour			5.105	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	73.513			
		(ii) 14 cum capacity	t.km		73.513		
		(iii) 10 cum capacity	t.km			73.513	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/25					
12.27	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile diameter - 750 mm					
		Unit = Running meter					
		Taking output = 40 metre					
		a) Materials					
		RCC Grade M35	cum	17.660	17.660	17.660	
		Rate for concrete may be adopted vide item no. 12.11 F (iv)					
		Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)					
		b) Materials Pile shoes					
		i) C.I. shoes for the pile	Kg	160.000	160.000	160.000	
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000	
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.000	50.000	50.000	
		c) Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with	hour	6.000	6.000	6.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		power unit and accessories.					
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.500	0.500	0.500	
		d) Labour					
		Mate/Supervisor	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 40 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/40					

- Note**
1. The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.
 2. In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 Percent of cost of concrete may be provided to cover its usage.

12.28 1100 & 1700

Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification
Pile diameter - 1000 mm
Unit = Running meter
Taking output = 30 metre

a) Materials						
RCC Grade M35	cum	23.550	23.550	23.550		
Rate for concrete may be adopted vide item no. 12.11 F (iv)						
Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)						
b) Materials Pile shoes						
i) C.I. shoes for the pile	Kg	160.000	160.000	160.000		
ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000		
iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.000	50.000	50.000		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.500	0.500	0.500	
		Hire and running charges for light crane for lowering reinforcement cage.	hour	0.500	0.500	0.500	
		d) Labour					
		Mate/Supervisor	day	0.213	0.213	0.213	
		Mazdoor	day	5.320	5.320	5.320	
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 30 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/30					
	Note	1. The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis. 2. In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 Percent of cost of concrete may be provided to cover its usage.					
12.29	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification Pile diameter - 1200 mm Unit = Running meter Taking output = 20 metre					
		a) Materials					
		RCC Grade M35	cum	22.610	22.610	22.610	
		Rate for concrete may be adopted vide item no. 12.11 F (iv)					
		Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)					
		b) Materials Pile shoes					
		i) C.I. shoes for the pile	Kg	160.000	160.000	160.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000	
		iii) Steel helmet on top of casing head during driving	Kg	50.000	50.000	50.000	
		c) Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.500	0.500	0.500	
		d) Labour					
		Mate/Supervisor	day	0.213	0.213	0.213	
		Mazdoor	day	5.320	5.320	5.320	
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 20 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/20					

- Note**
- The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.
 - In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 Percent of cost of concrete may be provided to cover its usage.

12.30 1100 & 1700

Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification

Pile Diameter = 500 mm

Unit = Running Meter

Taking output = 60 m

a) Materials

RCC Grade M35	cum	11.780	11.780	11.780
Rate for concrete may be adopted vide item no. 12.11 F (iv)				
Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)				

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material Pile shoes					
		a) C.I Shoes	Kg	240.000	240.000	240.000	
		b) M.S. shoes	Kg	105.000	105.000	105.000	
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.000	30.000	30.000	
		c) Machinery					
		Crane 20 t capacity	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		d) Labour					
		Mate/Supervisor	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 60 m = a+b+c+d+e+f					
		Rate per metre (a+b+c+d+e+f)/60					
	Note	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.31	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 750 mm					
		Unit = Running Meter					
		Taking output = 50 m					
		a) Materials					
		RCC Grade M35	cum	22.080	22.080	22.080	
		Rate for concrete may be adopted vide item no. 12.11 F (iv)					
		Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)					
		b) Material Pile shoes					
		a) C.I. shoes	Kg	160.000	160.000	160.000	
		b) M.S. shoes	Kg	70.000	70.000	70.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	40.000	40.000	40.000	
		c) Machinery					
		Crane 35 T capacity	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		d) Labour					
		Mate/Supervisor	day	0.213	0.213	0.213	
		Mazdoor	day	5.320	5.320	5.320	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 50 m = a+b+c+d+e+f					
		Rate per metre (a+b+c+d+e+f)/50					

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

12.32 1100 & 1700

Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification
Pile Diameter = 1000 mm
Unit = Running Meter
Taking output = 40 m

a) Materials						
RCC Grade M35	cum	31.400	31.400	31.400		
Rate for concrete may be adopted vide item no. 12.11 F (iv)						
Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)						
b) Material Pile shoes						
a) C.I. shoes for the pile	Kg	160.000	160.000	160.000		
b) M.S. shoes @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000		
c) Steel helmet and cushion block on top of pile head during driving.	Kg	50.000	50.000	50.000		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Crane 50 t capacity.	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		d) Labour					
		Mate/Supervisor	day	0.266	0.266	0.266	
		Mazdoor	day	6.650	6.650	6.650	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 40 m = a+b+c+d+e+f					
		Rate per metre (a+b+c+d+e+f)/40					

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

**12.33 1100&1
700**

Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification

Size of pile - 300 mm x 300 mm

Unit = Running Meter

Taking output = 60 m

a) Materials

RCC Grade M-35

RCC Grade M35

Rate for concrete may be adopted vide item no. 12.11 F (iv)

cum	5.400	5.400	5.400
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b) Material Pile shoes

a) C I shoes

kg	240.000	240.000	240.000
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b) M. S shoes

kg	105.000	105.000	105.000
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c) Steel helmet and cushion block on top of pile head during driving.

Kg	30.000	30.000	30.000
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c) Machinery

Crane 10 tonne capacity

hour	6.000	6.000	6.000
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Vibrating Pile driving hammer complete with power unit and accessories.

hour	6.000	6.000	6.000
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Labour					
		Mate/Supervisor	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	
		Cost for 60 m = a+b+c+d+e+f					
		Rate per metre (a+b+c+d+e+f)/60					
		Note					The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.
12.34	1100 &1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Size of pile - 500 mm x 500 mm					
		Unit = Running Meter					
		Taking output = 50 m					
		a) Materials					
		RCC Grade M-35					
		RCC Grade M35	cum	12.500	12.500	12.500	
		Rate for concrete may be adopted vide item no. 12.11 F (iv)					
		b) Material Pile shoes					
		a) C I shoes	kg	160.000	160.000	160.000	
		b) M. S shoes	kg	70.000	70.000	70.000	
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.000	30.000	30.000	
		c) Machinery					
		Crane 20 tonne capacity	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		d) Labour					
		Mate/Supervisor	day	0.213	0.213	0.213	
		Mazdoor	day	5.320	5.320	5.320	
		Add 1 Percent of (a+b+c) for carriage of piles from					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

casting yard to work site and stacking, and other imponderables during installation.

e) Overhead charges	@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)
f) Contractor's profit	@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)

Cost for 50 m = a+b+c+d+e+f

Rate per metre (a+b+c+d+e+f)/50

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

**12.35 1100
&1700**

Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification

Size of pile - 750 mm x 750 mm

Unit = Running Meter

Taking output = 40 m

a) Materials

RCC Grade M-35

RCC Grade M35	cum	22.500	22.500	22.500
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Rate for concrete may be adopted vide item no. 12.11 F (iv)

b) Material

Pile shoes

a) C I shoes	kg	160.000	160.000	160.000
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b) M. S shoes	kg	70.000	70.000	70.000
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c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.000	30.000	30.000
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c) Machinery

Crane 20 tonne capacity	hour	6.000	6.000	6.000
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Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000
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d) Labour

Mate/Supervisor	day	0.213	0.213	0.213
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Mazdoor	day	5.320	5.320	5.320
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Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

e) Overhead charges @ on (b+c+d) @ on (b+c+d) @ on (b+c+d)
 f) Contractor's profit @ on (b+c+d+e) @ on (b+c+d+e) @ on (b+c+d+e)

Cost for 40 m = a+b+c+d+e+f

Rate per metre (a+b+c+d+e+f)/40

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

**12.36 1100,
1900**

**Driven Vertical Steel Piles
complete as per Drawing and
& Technical Specification**

Section of the pile - H Section
steel column 400 x 250 mm
(ISHB Series)

Unit = Running Meter

Taking output = 70 m

a) Materials

Structural steel including 5 Percent wastage @ 82.20 kg/m	tonnes	6.040	6.040	6.040
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b) Machinery

Crane 10 T capacity	hour	6.000	6.000	6.000
Vibrating Pile driving hammer complete with power unit and other accessories.	hour	6.000	6.000	6.000

c) Labour

Mate/Supervisor	day	0.160	0.160	0.160
Mazdoor	day	3.990	3.990	3.990

Add 0.5 Percent of (a+b+c) for providing steel helmet on top of pile head during driving, stacking of piles at site, providing anti-corrosion treatment and other imponderables during installation.

d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 70 m = a+b+c+d+e

Rate per metre (a+b+c+d+e)/70

**12.37 1100
&1900**

**Driven Vertical Steel Piles
complete as per Drawing and
& Technical Specification**

Section of the pile - H Section
steel column 450 x 250 mm
(ISHB Series)

Unit = Running Meter

Taking output = 60 m

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Materials					
		Structural steel including 5 Percent wastage @92.50 kg/m	tonnes	5.830	5.830	5.830	
		b) Machinery					
		Crane 10 T capacity	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		Add 0.5 Percent of (a+b+c) for providing steel helmet and cushion block on top of pile head during driving, stacking of piles at site, providing anti-corrosive treatment and other imponderables during installation.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 60 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/60					
12.38	1100	Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Initial and routine load test	tonne	1.000	1.000	1.000	
		b) Lateral load test	tonne	1.000	1.000	1.000	
		Note Although, this item is incidental to work and is not required to be included in BOQ of contract, the same is required to be added in the estimate to assess cost of work.					
12.39		Dismantling of Reinforced Concrete Pile head complete as per Drawing and Technical Specification					
		Unit = cum					
		Taking output = 1.25 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor with Pneumatic breaker	day	0.665	0.665	0.665	
		Blacksmith	day	0.333	0.333	0.333	
		Mazdoor for loading and unloading	day	0.333	0.333	0.333	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Air Compressor 250 cfm	hour	0.625	0.625	0.625	
		Pneumatic breaker	hour	1.250	1.250	1.250	
		Tipper					
		For transportation to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t.km	1.875			
		(ii) 14 cum capacity	t.km		1.875		
		(iii) 10 cum capacity	t.km			1.875	
		Loading & unloading time					
		(i) 18 cum capacity	hour	0.208			
		(ii) 14 cum capacity	hour		0.250		
		(iii) 10 cum capacity	hour			0.292	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					
12.40	1100, 1500 & 1700	Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification					
	A	RCC Grade M20					
	Case I	RCC Grade M20 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
	Case II	RCC Grade M20 using batching plant & manual placing					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub-analysis 21.06)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum	tonne-	150 x L1	150 x L1	150 x L1	
		Capacity)	km				
		For unloading	hour	3.333	3.333	3.333	
		d) Formwork @ 4 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
12.40	B Case I	RCC Grade M25					
		RCC Grade M25 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub-analysis 21.07)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
	Case II	RCC Grade M25 using batching plant & manual placing Unit = cum Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.07)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	3.333	3.333	3.333	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
12.40	C Case I	RCC Grade M30 RCC Grade M30 using batching plant & Concrete pump Unit = cum Taking output = 60 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
	Case II	RCC Grade M30 using batching plant & manual placing					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	3.333	3.333	3.333	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
12.40	D	RCC Grade M35					
	Case I	RCC Grade M35 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
	Case II	RCC Grade M35 using batching plant & manual placing					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	3.333	3.333	3.333	
		d) Formwork @ 4 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
12.40	E Case I	RCC Grade M40					
		RCC Grade M40 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	Case II	RCC Grade M40 using batching plant & manual placing Unit = cum Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	3.333	3.333	3.333	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
12.40	F Case I	RCC Grade M45 RCC Grade M45 using batching plant & Concrete pump Unit = cum Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.13)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/60					
	Case II	RCC Grade M45 using batching plant & manual placing Unit = cum Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.13)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	3.333	3.333	3.333	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/60					
12.41	1100&1 700	Levelling Course for Pile cap					
		Providing and laying of PCC M15 levelling course 100mm thick below the pile cap.					
	Case I	PCC Grade M15 using batching plant & Concrete pump					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	PCC Grade M15 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.42	1600	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		Unit = MT					
		Taking output = 8 MT					
		a) Material					
		MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	5.333	5.333	5.333	
		Bending Machine	hour	5.333	5.333	5.333	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Electric generator 15 KVA	hour	5.333	5.333	5.333	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
12.43	1600	Supplying, Fitting and Placing un-coated Mild steel reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		Unit = MT					
		Taking output = 8 MT					
		a) Material					
		MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	5.333	5.333	5.333	
		Bending Machine	hour	5.333	5.333	5.333	
		Electric generator 15 KVA	hour	5.333	5.333	5.333	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					

CHAPTER – 13

BRIDGE SUBSTRUCTURE

PREAMBLES:

- 1 Although, Substructures are generally constructed in cement concrete, the rate analysis for brick and stone masonry in CM 1:3 have also been included which can be adopted if permitted by design.
- 2 The cost of formwork will vary with the height of the substructure. Provision has accordingly been made.
- 3 As the higher grade of concrete is costlier, the provision made for formwork on percentage basis has been suitably adjusted to make it comparable with other grades.
- 4 Bridge bearing, being commercial items produced by specialized firms with imported technology and parts, the rates for the same are required to be ascertained from the market for the approved design and technical specifications. These rates are not included in the analysis as they can vary from design to design and base on their loading arrangement and span variations, hence if required they maybe analysed for a particular project depending upon the loadings and design.
- 5 Filter media and backfilling behind abutments are required to be provided as per guidelines given in IRC: 78.
- 6 Weep holes shall be provided as per Clause 2706 of MoRT&H Specifications.
- 7 In case of roller-cum-rocker bearings, only full circular rollers are to be provided.
- 8 All bearings shall be set truly level so as to have full and even seating.
- 9 For elastomeric bearing pads, the concrete surface shall be leveled such that the variation is not more than 1.5 mm from a straight edge placed in any direction across the area.
- 10 The bearing should be procured only from those manufacturers who have been pre-qualified by the Ministry of Road Transport and Highways.
- 11 The bottoms of girders resting on the bearing shall be plane and truly horizontal.
- 12 For spans in grade, the bearing shall be placed horizontal by using sole plates for suitable designed RCC pedestals.

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.01	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications Unit = cum Taking output = 1 cum					
		a) Material					
		Bricks Ist class	each	500.000	500.000	500.000	
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	0.240	0.240	0.240	
		Water for curing	KL	0.483	0.483	0.483	
		b) Labour					
		Mate	day	0.085	0.085	0.085	
		Mason	day	1.064	1.064	1.064	
		Mazdoor	day	1.064	1.064	1.064	
		Add for scaffolding @ 5 Percent of cost of material and labour					
		c) Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.02			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.027		
		(iii) 6 KL capacity	hour			0.018 x L1 + 0.054	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
13.02	1300 & 2200	Pointing with cement mortar (1:3) on brick work in substructure as per Technical Specifications Unit = 10 sqm Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	0.030	0.030	0.030	
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per 10 sqm (a+b+c+d)					
Note		Scaffolding is already included in item 13.01					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.03	1300 & 2200	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications Unit = 10 sqm Taking output = 10 sqm a) Material Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A) Water for curing b) Labour Mate Mason Mazdoor c) Machinery Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip) (i) 16 KL capacity (ii) 12 KL capacity (iii) 6 KL capacity d) Overhead charges e) Contractor's profit Rate per 10 sqm (a+b+c+d+e)					
			cum	0.144	0.144	0.144	
			KL	0.139	0.139	0.139	
			day	0.053	0.053	0.053	
			day	0.665	0.665	0.665	
			day	0.665	0.665	0.665	
			hour	0.002 x L1 + 0.006			
			hour		0.003 x L1 + 0.008		
			hour			0.005 x L1 + 0.015	
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Note	1. Scaffolding is already included in item no. 13.01 2. The number of masons and Mazdoors already catered in the cement mortar have been taken into account while providing these categories in brick masonry, pointing and plastering.					
13.04	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications A Random Rubble Masonry (coursed/uncoursed) Unit = cum Taking output = 1 cum a) Material Stone Through and bond stone (7no.x0.24mx0.24mx0.39m = 0.16 cu.m) Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A) Water for curing					
			cum	1.000	1.000	1.000	
			No	7.000	7.000	7.000	
			cum	0.330	0.330	0.330	
			KL	0.966	0.966	0.966	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		Mate	day	0.128	0.128	0.128	
		Mason	day	1.596	1.596	1.596	
		Mazdoor	day	1.596	1.596	1.596	
		Add for scaffolding @ 5 Percent of cost of a) Material and b) Labour					
		c) Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.013 x L1 + 0.04			
		(ii) 12 KL capacity	hour		0.018 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.036 x L1 + 0.107	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
13.04	B	Coursed rubble masonry (first sort)					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.100	1.100	1.100	
		Through and bond stone (7 no.x 0.24 m x 0.24 m x 0.39 m = 0.16 cum)	each	7.000	7.000	7.000	
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	0.300	0.300	0.300	
		Water for curing	KL	0.966	0.966	0.966	
		b) Labour					
		Mate	day	0.160	0.160	0.160	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.995	1.995	1.995	
		Add for scaffolding @ 5 Percent of cost of material and labour					
		c) Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip))					
		(i) 16 KL capacity	hour	0.013 x L1 + 0.04			
		(ii) 12 KL capacity	hour		0.018 x L1 + 0.054		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.036 x L1 + 0.107	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
13.04	C	Ashlar masonry (first sort) Plain ashlar Unit = cum Taking output = 1 cum					
	a)	Material					
		Stone	cum	1.110	1.110	1.110	
		Through and bond stone (7no.x0.24mx0.24mx0.39 m = 0.16 cu.m)	each	7.000	7.000	7.000	
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	0.330	0.330	0.330	
		Water for curing	KL	0.966	0.966	0.966	
	b)	Labour for masonry work					
		Mate	day	0.266	0.266	0.266	
		Mason	day	3.325	3.325	3.325	
		Mazdoor	day	3.325	3.325	3.325	
		Add for scaffolding @ 5 Percent of cost of a) Material and b) Labour					
	c)	Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.013 x L1 + 0.04			
		(ii) 12 KL capacity	hour		0.018 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.036 x L1 + 0.107	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
	Note	The labours already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.					
13.05	1500, 1700 & 2200	Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications					
13.05	A	PCC Grade M15					
	(p)	Height upto 5m PCC Grade M15 using batching plant & Concrete pump					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis -21.03)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	B	PCC Grade M20					
	(p)	Height upto 5m					
		PCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis -21.04)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.143	0.143	0.143	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.571	1.571	1.571	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	C	PCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.06)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(q) Height 5m to 10m					
C		PCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.06)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 12 Percent on cost of concrete i.e. cost of material, labour and machinery Add 2 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(r) Height above 10m					
C		PCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis - 21.06)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	D	PCC Grade M30					
	(p)	Height upto 5m					
		PCC Grade M30 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.08)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(q) Height 5m to 10m					
D		PCC Grade M30 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis -21.08)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 12 Percent on cost of concrete i.e. cost of material, labour and machinery Add 2 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(r) Height above 10m					
D		PCC Grade M30 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis -21.08)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)	km				
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer	hour	0.726	0.726	0.726	
		pump					
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	E	RCC Grade M20					
	(p)	Height upto 5m					
		RCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.05)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05 E		(q) Height 5m to 10m For height, upto 10m, add 2 Percent of cost as above excluding formwork. For cost of formwork add 12 Percent of cost of material, labour and machinery instead of 4 Percent. RCC Grade M20 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis -21.05)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 12 Percent on cost of concrete i.e. cost of material, labour and machinery Add 2 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					
13.05 E	(r)	Height above 10m Same as Item 12.08 (C) with the following changes: (i) Add 4 Percent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 Percent instead of 4 Percent of cost of material, labour and machinery. RCC Grade M20 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis -21.05)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	F	RCC Grade M25					
	(p)	Height upto 5m					
		Same as Item 12.8 (E) upto 5m height, excluding formwork. For cost of formwork, add 10 Percent of cost of material, labour and machinery instead of 3.75 Percent.					
		RCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(q) Height 5m to 10m					
F		RCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 11.8 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 1.8 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
13.05		(r) Height above 10m					
F		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork					
		Add @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	G	RCC Grade M30					
	(p)	Height upto 5m					
		RCC Grade M30 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.09)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					
13.05 G		(q) Height 5m to 10m RCC Grade M30 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.09)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork Add @ 11.5 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Formwork					
		Add 1.6 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	(r)	Height above 10m					
G		RCC Grade M30 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.09)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 14 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3.5 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	H	RCC Grade M35					
	(p)	Height upto 5m					
		RCC Grade M35 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.11)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					
13.05 H		(q) Height 5m to 10m RCC Grade M35 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.11)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork Add @ 11 Percent on cost of concrete i.e. cost of material, labour and					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		machinery (a+b+c) for Formwork					
		Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Note	The basic components of this analysis are the same as those of items 13.08 (A to H). The only changes are as under:					
		a) Ramps/Stairs: Extra expenditure on structures which are more than 5 m high @ 2 Percent of cost for height upto 10 m and 4 Percent for heights above 10 m will be involved for approaching the work spot by providing higher ramp/stair case for use by the working parties.					
		b) The above mentioned percentages have been suitably modified for different categories as cost for various categories varies, whereas effort for access for same height will be similar. As the cost of richer concrete is comparatively more, the percentage to be added has been reduced to maintain the same cost for extra efforts.					
13.05	(r)	Height above 10m					
H		RCC Grade M35 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.11)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		I RCC Grade M40					
		(p) Height upto 5m					
		RCC Grade M40 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05 I		(q) Height 5m to 10m For height, upto 10m, add 1.4 Percent of cost as above excluding formwork. For cost of formwork add 11 Percent of cost of material, labour and machinery . RCC Grade M40 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 11 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05 I		(r) Height above 10m					
		For height, above 10m, add 3 Percent of cost as above excluding formwork. For cost of formwork add 13 Percent of cost of material, labour and machinery					
		RCC Grade M40 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	J	RCC Grade M45					
	(p)	Height upto 5m					
		RCC Grade M45 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis -21.13)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(q) Height 5m to 10m					
J		For height, upto 10m, add 1.4 Percent of cost as above excluding formwork. For cost of formwork add 11 Percent of cost of material, labour and machinery.					
		RCC Grade M45 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.13)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 11 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(r) Height above 10m					
J		For height, above 10m, add 3 Percent of cost as above excluding formwork. For cost of formwork add 13 Percent of cost of material, labour and machinery					
		RCC Grade M45 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis - 21.13)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05	K	RCC Grade M50					
		RCC Grade M50 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05		(q) Height 5m to 10m					
K		For height, upto 10m, add 1.4 Percent of cost as above excluding formwork. For cost of formwork add 11 Percent of cost of material, labour and machinery.					
		RCC Grade M50 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 11 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05 K		(r) Height above 10m					
		For height, above 10m, add 3 Percent of cost as above excluding formwork. For cost of formwork add 13 Percent of cost of material, labour and machinery					
		RCC Grade M50 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork					
		Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

Note

The basic components of this analysis are the same as those of items 13.08 (A to K). The only changes are as under:

- Ramps/Stairs: Extra expenditure on structures which are more than 5 m high @ 2 Percent of cost for height upto 10 m and 4 Percent for heights above 10 m will be involved for approaching the work spot by providing higher ramp/stair case for use by the working parties.
- The above mentioned percentages have been suitably modified for different categories as cost for various categories varies, whereas effort for access for same height will be similar. As the cost of richer concrete is comparatively more, the percentage to be added has been reduced to maintain the same cost for extra efforts.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.06	Section 1600 & 2200	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications Unit = MT Taking output = 8 MT					
		a) Material MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	6.667	6.667	6.667	
		Bending Machine	hour	6.667	6.667	6.667	
		Electric generator 15 KVA	hour	6.667	6.667	6.667	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
13.07	Section 1600 & 2200	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification Unit = MT Taking output = 8 MT					
		a) Material MS bars including 5 Percent overlaps and	tonne	8.400	8.400	8.400	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		wastage					
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	6.667	6.667	6.667	
		Bending Machine	hour	6.667	6.667	6.667	
		Electric generator 15 KVA	hour	6.667	6.667	6.667	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
13.08	2706 & 2200	Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V: 20H towards drawing face. Complete as per drawing and Technical Specifications Unit = Nos. Taking output = 30 Nos.					
		a) Material					
		AC pipe 100 mm dia. (including wastage @ 5 Percent)	metre	31.500	31.500	31.500	
		Average length of weep hole is taken as one metre for the purpose of estimating.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		MS clamp	each	30.000	30.000	30.000	
		collar for AC pipe	each	10.000	10.000	10.000	
		(average) taking 10% of above pipe rate					
		Per Cum Basic Cost	cum	0.050	0.050	0.050	
		(Rate taken from sub-analysis -21.01 A)					
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.333	0.333	0.333	
		c) Overhead charges @ on (a+b)					
		d) Contractor's profit @ on (a+b+c)					
		Cost for 30 m = a+b+c+d					
		Rate per m (a+b+c+d)/30					
	Note	1. In case of stone masonry, the size of the weep hole shall be 150 mm x 80 mm or circular with 150 mm diameter.					
		2. For structure in stone masonry, the weep holes shall be deemed to be included in the item of stone masonry work and shall not be paid separately.					
13.09	710.1.4.of IRC:78 & 2200	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification					
		Unit = cum					
		Taking output = 10 cum					
	A	Granular material					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	9.310	9.310	9.310	
		b) Material					
		Granular material	cum	12.000	12.000	12.000	
		c) Machinery					
		Plate compactor/power rammer	hour	2.500	2.500	2.500	
		Water Tanker 6 Kl capacity	hour	0.050	0.050	0.050	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum of granular backfill = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					
13.09	B	Sandy material					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310	
		b) Material					
		Sand	cum	12.000	12.000	12.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Plate compactor/ power rammer	hour	2.500	2.500	2.500	
		Water Tanker 6 kl capacity	hour	0.060	0.060	0.060	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum of sandy backfill = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					
13.10	710.1.4.of IRC:78 and 2504.2	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification. Unit = cum Taking output = 10 cum.					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.000	12.000	12.000	
		c) Machinery					
		Water Tanker of 6 KL capacity	hour	0.060	0.060	0.060	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		cost for 10 cum of Fiter Media = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					
13.11	704	Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. Geocomposite for planar drainage, realized by					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																			
				Large	Medium	Small																				
		<p>thermobonding a draining core in extruded monofilaments with two filtering nonwoven geotextiles that may also be working as separation or protecting layers. The draining three dimensional core will have a “W” configuration as longitudinal parallel channels. Minimum thickness to be 7.2mm, with two filtering UV stabilized polypropylene nonwoven geotextile of minimum thickness of 0.75 mm having pores of 150 micron and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geocomposite having in plane flow capacity of 2.1 L / (m.s) at hydraulic gradient of 1.0 & 20 kpa pressure and tensile strength of 18 kN/m , with mass per unit area of 740 gsm, supplied in the form of roll for easy transportation to site of work as per detailed specification all complete as per directions of Engineer in charge.</p> <p>Unit = Sqm Taking output = 300 Sqm</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.266</td><td>0.266</td><td>0.266</td></tr><tr><td>Mazdoor</td><td>day</td><td>3.990</td><td>3.990</td><td>3.990</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr></table> <p>b) Material</p> <table><tr><td>Geosynthetic Drainage Composite</td><td>sqm</td><td>300.000</td><td>300.000</td><td>300.000</td></tr></table> <p>Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia pannels, overlaps and other protective elements for synthetic Composites and other miscelleneus activities required to complete the item in all respect including transpotarion & takes.</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 300 sqm = a+b+c+d Rate per sqm = (a+b+c+d)/300</p>	Mate	day	0.266	0.266	0.266	Mazdoor	day	3.990	3.990	3.990	Mazdoor (Skilled)	day	2.660	2.660	2.660	Geosynthetic Drainage Composite	sqm	300.000	300.000	300.000				
Mate	day	0.266	0.266	0.266																						
Mazdoor	day	3.990	3.990	3.990																						
Mazdoor (Skilled)	day	2.660	2.660	2.660																						
Geosynthetic Drainage Composite	sqm	300.000	300.000	300.000																						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																				
				Large	Medium	Small																					
13.12	704	<p>Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. having thermobonding a draining core - HDPE geonet comprises of two sets of parallel overlayed ribs integrally connected to have a rhomboidal shape with a polyethylene film and a nonwoven geotextile having mass per unit area 130 g/m2 and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geocomposite having in plane flow capacity of 0.7 L / (m.s) at hydraulic gradient of 1.0 & 20 kPa pressure and tensile strength of 13.5 kN/ m , with mass per unit area of 830 gsm, at easily accessible location including top and bottom, with all leads and lifts, manpower and machinery, materials, labour etc. complete and as directed by Engineer - In - Charge.</p> <p>Unit = Sqm</p> <p>Taking output = 300 Sqm</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.266</td><td>0.266</td><td>0.266</td></tr><tr><td>Mazdoor</td><td>day</td><td>3.990</td><td>3.990</td><td>3.990</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>2.660</td><td>2.660</td><td>2.660</td></tr></table> <p>b) Material</p> <table><tr><td>Geosynthetic Drainage Composite</td><td>sqm</td><td>300.000</td><td>300.000</td><td>300.000</td></tr></table> <p>Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia pannels, overlaps and other protective elements for synthetic Composites and other miscelleneus activities required to complete the item in all respect including transpotarion & takes.</p> <p>c) Overhead charges</p> <p>d) Contractor's profit</p> <p>Cost for sqm = a+b+c+d</p> <p>Rate per sqm = (a+b+c+d)/300</p>	Mate	day	0.266	0.266	0.266	Mazdoor	day	3.990	3.990	3.990	Mazdoor (Skilled)	day	2.660	2.660	2.660	Geosynthetic Drainage Composite	sqm	300.000	300.000	300.000					
Mate	day	0.266	0.266	0.266																							
Mazdoor	day	3.990	3.990	3.990																							
Mazdoor (Skilled)	day	2.660	2.660	2.660																							
Geosynthetic Drainage Composite	sqm	300.000	300.000	300.000																							

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																			
				Large	Medium	Small																				
13.13	2000, 1000 & 2200	<p>Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.</p> <p>Unit: one tonne capacity</p> <p>Considering a 250 tonne capacity bearing for this analysis</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.080</td><td>0.080</td><td>0.080</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>0.665</td><td>0.665</td><td>0.665</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr></table> <p>b) Material</p> <table><tr><td>Cast steel rocker bearing assembly of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications</td><td>each</td><td>1.000</td><td>1.000</td><td>1.000</td></tr></table> <p>Add 1 Percent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>cost for 250 tonnes capacity bearing = a+b+c+d</p> <p>Rate per tonne capacity = (a+b+c+d)/250</p>	Mate	day	0.080	0.080	0.080	Mazdoor (Skilled)	day	0.665	0.665	0.665	Mazdoor	day	1.330	1.330	1.330	Cast steel rocker bearing assembly of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each	1.000	1.000	1.000				
Mate	day	0.080	0.080	0.080																						
Mazdoor (Skilled)	day	0.665	0.665	0.665																						
Mazdoor	day	1.330	1.330	1.330																						
Cast steel rocker bearing assembly of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each	1.000	1.000	1.000																						
13.14	2000 , 1000 & 2200	<p>Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.</p> <p>Unit: one tonne capacity</p> <p>Considering a 250 tonne capacity bearing for this analysis</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.080</td><td>0.080</td><td>0.080</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>0.665</td><td>0.665</td><td>0.665</td></tr></table>	Mate	day	0.080	0.080	0.080	Mazdoor	day	1.330	1.330	1.330	Mazdoor (Skilled)	day	0.665	0.665	0.665									
Mate	day	0.080	0.080	0.080																						
Mazdoor	day	1.330	1.330	1.330																						
Mazdoor (Skilled)	day	0.665	0.665	0.665																						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Forged steel roller bearing of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each	1.000	1.000	1.000	
		Add 1 Percent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		cost for 250 tonnes capacity bearing = a+b+c+d					
		Rate per tonne capacity = (a+b+c+d)/250					
13.15	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.					
		Unit: one tonne capacity					
		Considering a 80 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	1.330	1.330	1.330	
		Mazdoor (Skilled)	day	0.665	0.665	0.665	
		b) Material					
		PTFE sliding plate bearing assembly of 80 tonnes design load capacity duly painted complete with all its components as per drawing and Technical Specifications	each	1.000	1.000	1.000	
		Add 1 Percent for foundation anchorage bolts and consumables.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		cost for 80 tonnes capacity bearing = a+b+c+d					
		Rate per tonne capacity = (a+b+c+d)/80					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																			
				Large	Medium	Small																				
13.16	2000 & 2200	<p>Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.</p> <p>Unit: one cubic centimetre</p> <p>Considering an elastomeric bearing of size 500 x 400 x 96 mm for this analysis.</p> <p>Overall volume - 19200 cu.cm</p> <p>Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm.</p> <p>Hence volume of elastometer = 14655 cu.cm.</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.080</td><td>0.080</td><td>0.080</td></tr><tr><td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>0.665</td><td>0.665</td><td>0.665</td></tr></table> <p>b) Material</p> <table><tr><td>Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.</td><td>each.</td><td>1.000</td><td>1.000</td><td>1.000</td></tr></table> <p>Add 1 Percent of cost of bearing assembly for foundation anchorage bolts and consumables.</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 19200 cc of elastomeric bearing = a+b+c+d</p> <p>Rate per cc of elastomeric bearing = (a+b+c+d)/ 19200</p>	Mate	day	0.080	0.080	0.080	Mazdoor	day	1.330	1.330	1.330	Mazdoor (Skilled)	day	0.665	0.665	0.665	Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	each.	1.000	1.000	1.000				
Mate	day	0.080	0.080	0.080																						
Mazdoor	day	1.330	1.330	1.330																						
Mazdoor (Skilled)	day	0.665	0.665	0.665																						
Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	each.	1.000	1.000	1.000																						
13.17	2000 & 2200	<p>Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.</p> <p>Unit: one tonne capacity</p>																								

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Considering the sliding bearing of 80 tonnes design capacity for this analysis.					
		a) Labour					
		Mate	day	0.059	0.059	0.059	
		Mazdoor	day	0.998	0.998	0.998	
		Mazdoor (Skilled)	day	0.466	0.466	0.466	
		b) Material					
		Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.	each.	1.000	1.000	1.000	
		Add 1 Percent of cost of bearing assembly for foundation anchorage bolts and consumables.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 80 tonnes of capacity bearing = a+b+c+d					
13.18	2000 & 2200	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved Technical Specifications.					
		Unit= one tonne capacity					
		Considering a Pot bearing assembly of 250 tonne capacity for this analysis.					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	1.995	1.995	1.995	
		Mazdoor (Skilled)	day	0.665	0.665	0.665	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/fabricated structural steel assemblies duly painted with all components as per clause 2006 and complete as per drawings and Technical Specifications. Add 1 Percent of cost of bearing assembly for foundation anchorage bolts and consumables.	Each	1.000	1.000	1.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 250 tonnes capacity bearing = a+b+c+d					
		Rate per tonne capacity = (a+b+c+d)/250					
13.19	Suggestive	Protection to substructure by using coal tar epoxy Providing and applying two coats of Two component, high build, 100 % solid content, low VOC,, polycyclin aromatic hydrocarbon based, Pot life – 2 hrs @ 72 deg. F , Tack free – 4-6 hrs , DFT per coat 80 -120 microns (dry) coal tar epoxy coating with Coal tar Unit = Sqm. Taking output = 100 Sqm					
		a) Labour					
		Mate	day	0.360	0.360	0.360	
		Painter	day	6.000	6.000	6.000	
		Mazdoor	day	3.000	3.000	3.000	
		b) Material					
		Coal Tar Epoxy coating @ 0.5 Kg per Square Meter coverage including 5% wastage Add 1 Percent of cost of abs towards miscellaneous (water, painting brush etc.).	Kg.	52.500	52.500	52.500	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 Sqm. = a+b+c+d					
		Rate per Sqm = (a+b+c+d)/100					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.20		Providing structural steel for sub-structure complete as per drawing and technical specifications Unit = MT Taking output = 10.00 MT					
		a) Material					
		Structural steel in plates, angles, etc including 5 Percent wastage	tonne	10.500	10.500	10.500	
		Nuts & bolts	Kg	105.000	105.000	105.000	
		b) Labour					
		(for cutting, bending, making holes, joining, welding and erecting in position)					
		Mate	day	16.327	16.327	16.327	
		Fitter	day	59.850	59.850	59.850	
		Blacksmith	day	59.850	59.850	59.850	
		Welder	day	59.850	59.850	59.850	
		Painter I class	day	23.940	23.940	23.940	
		Mazdoor	day	204.687	204.687	204.687	
		Electrodes, cutting gas and other consumables @ 10 Percent of cost of (a) above					
		c) Machinery					
		Mobile Hydraulic Crane 10 tonne capacity (For Fabrication)	Hrs	40.000	40.000	40.000	
		Crane 35 tonne capacity (For Loading & Unloading @ 1 hr for each operation)	Hrs	2.000	2.000	2.000	
		Crane 35 tonne capacity (For Lifting and Placing in Position @ 2 hrs)	Hrs	2.000	2.000	2.000	
		Trailer 30 tonne capacity for transporting to site.	Hrs	2+L/15	2+L/15	2+L/15	
		Applying 2 coats primer before painting of Truss and Girder (42 sqm/tonne)	Lit	525.000	525.000	525.000	
		Painting of Truss and Girder	Lit	525.000	525.000	525.000	
		Sundries @ 3% of the above					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/10					

CHAPTER – 14
BRIDGE SUPERSTRUCTURE

PREAMBLES:

- 1 The rate for the wearing coat has been analyzed as under:

- a) Cement concrete wearing coat
- b) Asphaltic concrete wearing coat
- c) Bitumen mastic wearing coat

The item may be selected as per approved design. In case the thickness of wearing coat is different from that analyzed, the rate for the desired thickness may be worked out on pro-rata basis.

- 2 The rate analysis has been done both for RCC Railing and M.S. Railing, which can be adopted as per approved design.
- 3 The length of drainage spout has been provided in such a way that it is connected to the as drainage system on the ground in case of flyovers and there is no splashing of water on the structure in case of bridges.
- 4 The rate for anti-corrosive treatment is required to be ascertained from firms specialized in this work.
- 5 Expansion joints involving movements exceeding 40 mm are specialised readymade items commercially produced by reputed firms with imported technology and parts. The rates for such joints are required to be ascertained from the firms pre-qualified by the Ministry.
- 6 The rate analysis for prestressed cement concrete of M 60 grade has also been included which can be adopted for bridges with innovative design/construction.
- 7 Supply of new type of expansion joint may be obtained on the basis of competitive bidding from amongst the suppliers pre-qualified by the Ministry of Road Transport and Highways. Further, a warranty of 10 years of trouble free performance may be insisted from the suppliers.
- 8 For bridges having wide deck/span length of more than 120 m or/and involving complex movements/ rotations in different directions/planes, provision of special type of modular expansion joints such as swivel joists joints are required for which firms specialized in this field may be consulted. Such cases will require prior approval of Ministry.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01	1500 &1600 1700	Furnishing and Placing Reinforced/ Prestressed cement concrete in super-structure as per drawing and Technical Specification					
14.01A	A	RCC Grade M20 Using Batching Plant, Transit Mixer and Concrete Pump Unit = cum Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.05)	cum	120.000	120.000	120.000	
		Water for curing	Kl	63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.218	0.218	0.218	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.452	3.452	3.452	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	300 x L1	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01A	(i)	For solid slab super-structure, 20-30 Percent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork and staging 20 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01A	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 25 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01A	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 30 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01A	(ii) For T-beam & slab, 25-35 Percent of (a+b+c)						
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 25 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01A	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 30 Percent of (a+b+c) e) Overhead charges f) Contractor's profit Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120		@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	
14.01A (ii)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 35 Percent of (a+b+c) e) Overhead charges f) Contractor's profit Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120		@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	
14.01	B	RCC Grade M25					
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump Unit = cum Taking output = 120 cum					
	a) Material						
		Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	120.000	120.000	120.000	
		Water for curing	Kl	63.000	63.000	63.000	
	b) Labour						
		For pouring and placing					
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
	c) Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	301 x L1	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01B	(i)	For solid slab super- structure, 20-30 Percent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 20 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01B (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 25 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01B (i)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 30 Percent of (a+b+c) e) Overhead charges f) Contractor's profit Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
14.01B	(ii)	For T-beam & slab, 25-35 Percent of (a+b+c) (p) Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 25 Percent of (a+b+c) e) Overhead charges f) Contractor's profit Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
14.01B (ii)	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 30 Percent of (a+b+c) e) Overhead charges f) Contractor's profit Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
14.01B (ii)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork and staging 35 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01	C	RCC Grade M 30					
14.01C		Using Batching Plant, Transit Mixer and Concrete Pump.					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.09)	cum	120.000	120.000	120.000	
		Water for curing	Kl	63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 tonne-cum Capacity) , L1 - lead in Kilometer	km	300 x L1	300 x L1	301 x L1	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01C	(i)	For solid slab super-structure, 20-30 Percent of (a+b+c)					
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 20 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120					
14.01C (i)	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 25 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120					
14.01C (i)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 30 Percent of (a+b+c)					
	e)	Overhead charges @ on (a+b+c+d)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Rate per cum = (a+b+c+d+e+f)/120					
14.01C	(ii)	For T-beam & slab, 25-35 Percent of (a+b+c)					
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork and staging 25 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01C (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 30 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01C (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 35 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01	D	RCC/PSC Grade M35					
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.11)	cum	120.000	120.000	120.000	
		Water for curing	Kl	63.000	63.000	63.000	
	b)	Labour					
		For pouring and placing					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
		c) Machinery					
		Transit truck					
		agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	300 x L1	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom					
		placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging					
		add the following:					
14.01D	(i)	For solid slab super-structure, 18-28 Percent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 18 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 23 Percent of (a+b+c)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(r)	Height above 10m					
(i)		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 28 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(ii)	For T-beam & slab, 23-33 Percent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 23 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(q)	Height 5m to 10m					
(ii)		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 28 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01D (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 33 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(iii)	For box girder and balanced cantilever, 38- 58 Percent of cost of concrete.					
		(p) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 38 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 48 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork and staging 58 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01	E	RCC/PSC Grade M-40					
14.01E		Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	120.000	120.000	120.000	
		Water for curing	Kl	63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	300 x L1	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01E	(i)	For solid/voided slab super-structure, 18-28 Percent of (a+b+c)					
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 18 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120					
14.01E (i)	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 23 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120					
14.01E (i)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 28 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(ii)	For T-beam & slab, 23-33 Percent of (a+b+c)					
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork and staging 23 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 28 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 33 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(iii)	For cast-in-situ box girder, segment construction and balanced cantilever, 38-58 Percent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 38 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		f) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d+e)	(a+b+c+d+e)	(a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(q)	Height 5m to 10m					
(iii)		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and					
		staging 48 Percent					
		of (a+b+c)					
		e) Overhead charges		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		f) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d+e)	(a+b+c+d+e)	(a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(r)	Height above 10m					
(iii)		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and					
		staging 58 Percent					
		of (a+b+c)					
		e) Overhead charges		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		f) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d+e)	(a+b+c+d+e)	(a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01F	F	RCC/PSC Grade M-45					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost	cum	120.000	120.000	120.000	
		(Rate taken from					
		sub-analysis -21.13)					
		Water for curing	Kl	63.000	63.000	63.000	
		b) Labour					
		For pouring and					
		placing					
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck					
		agitator					
		For transportation (6 tonne-cum Capacity) , L1 - km		300 x L	300 x L	300 x L	
		lead in Kilometer					
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom	hour	2.905	2.905	2.905	
		placer pump					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01F		(i) For solid slab/voided slab super-structure, 16-26 Percent of cost of concrete (a+b+c)					
		(p) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 16 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01F		(q) Height 5m to 10m					
(i)		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 21 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01F (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 26 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01F	(ii)	For T-beam & slab including launching of precast girders by launching truss upto 40 m span, 21-31 Percent of cost of concrete.					
		(p) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 21 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01F (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 26 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01F (ii)	(r)	<p>Height above 10m</p> <p>Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum</p> <p>d) Formwork and staging 31 Percent of (a+b+c)</p> <p>e) Overhead charges</p> <p>f) Contractor's profit</p> <p>Cost for 120 cum = a+b+c+d+e+f</p> <p>Rate per cum = (a+b+c+d+e+f)/120</p>					
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
14.01F	(iii)	<p>For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56 Percent of cost of concrete.</p> <p>(p) Height upto 5m</p> <p>Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum</p> <p>d) Formwork and staging 36 Percent of (a+b+c)</p> <p>e) Overhead charges</p> <p>f) Contractor's profit</p> <p>Cost for 120 cum = a+b+c+d+e+f</p> <p>Rate per cum = (a+b+c+d+e+f)/120</p>					
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
14.01F (iii)	(q)	<p>Height 5m to 10m</p> <p>Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum</p> <p>e) Overhead charges</p> <p>f) Contractor's profit</p> <p>Cost for 120 cum = a+b+c+d+e+f</p> <p>Rate per cum = (a+b+c+d+e+f)/120</p>					
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01F (iii)	(q)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 56 Percent of (a+b+c) e) Overhead charges f) Contractor's profit Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120		@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	@ on (a+b+c+d) @ on (a+b+c+d+e)	
14.01	G	PSC Grade M-50 Unit = cum Taking output = 120 cum a) Material Per Cum Basic Cost cum 120.000 120.000 120.000 (Rate taken from sub-analysis -21.14) Water for curing KI 63.000 63.000 63.000 b) Labour For pouring and placing Mate day 0.263 0.263 0.263 Mason day 1.995 1.995 1.995 Mazdoor day 4.592 4.592 4.592 c) Machinery Transit truck agitator For transportation (6 tonne-cum Capacity) , L1 - km 300 x L 300 x L 300 x L lead in Kilometer For unloading hour 2.905 2.905 2.905 Hydraulic Boom placer pump Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading) (i) 16 KL capacity hour 0.875 x L1 + 2.625 (ii) 12 KL capacity hour 1.167 x L1 + 3.5 (iii) 6 KL capacity hour 2.333 x L1 + 7 For formwork and staging add the following:					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01G	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 Percent of cost of concrete					
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 35 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01G (i)	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 45 Percent of (a+b+c)		45.000			
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01G (i)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 55 Percent of (a+b+c)		55.000			
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01	H	PSC Grade M- 55 Unit = cum Taking output = 120 cum a) Material Per Cum Basic Cost cum 120.000 120.000 120.000 (Rate taken from sub-analysis -21.15) Water for curing KI 63.000 63.000 63.000 b) Labour For pouring and placing Mate day 0.263 0.263 0.263 Mason day 1.995 1.995 1.995 Mazdoor day 4.592 4.592 4.592 c) Machinery Transit truck agitator For transportation tonne- 300 x L 300 x L 300 x L (6 cum Capacity) , L1 km - lead in Kilometer For unloading hour 2.905 2.905 2.905 Hydraulic Boom hour 2.905 2.905 2.905 placer pump Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading) (i) 16 KL capacity hour 0.875 x L1 + 2.625 (ii) 12 KL capacity hour 1.167 x L1 + 3.5 (iii) 6 KL capacity hour 2.333 x L1 + 7 For formwork and staging add the following:					
14.01H	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 Percent of cost of concrete (p) Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum d) Formwork and staging 35 Percent of (a+b+c) e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 45 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 55 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
<p>Note</p> <ol style="list-style-type: none"> 1. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design. 2. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis. 							
14.01	I	PSC Grade M- 60					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost cum	120.000	120.000	120.000		
		(Rate taken from sub-analysis -21.16)					
		Water for curing Kl	63.000	63.000	63.000		
		b) Labour					
		For pouring and placing					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L	300 x L	300 x L	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01H	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 Percent of cost of concrete					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 35 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H	(q)	Height 5m to 10m					
(i)		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 45 Percent of (a+b+c)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 55 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01	J	PSC Grade M- 65					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost cum		120.000	120.000	120.000	
		(Rate taken from sub-analysis -21.17)					
		Water for curing Kl		63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					
		Mate day		0.263	0.263	0.263	
		Mason day		1.995	1.995	1.995	
		Mazdoor day		4.592	4.592	4.592	
		c) Machinery					
		Transit truck agitator					
		For transportation tonne- (6 cum Capacity) , L1 km		300 x L	300 x L	300 x L	
		- lead in Kilometer					
		For unloading hour		2.905	2.905	2.905	
		Hydraulic Boom hour		2.905	2.905	2.905	
		placer pump					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity hour		0.875 x L1 + 2.625			
		(ii) 12 KL capacity hour			1.167 x L1 + 3.5		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 Percent of cost of concrete					
	(p)	Height upto 5m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 35 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H (i)	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 45 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H (i)	(r)	Height above 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 55 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Cost for 120 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/120

- Note**
1. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.
 2. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis.

14.02 1600

Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications

Unit = MT

Taking output = 8 MT

a) Material

MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400
Binding wire	Kg	48.000	48.000	48.000

b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position

Mate	day	0.213	0.213	0.213
Blacksmith	day	1.330	1.330	1.330
Mazdoor	day	3.990	3.990	3.990

c) Machinery

Cutting Machine	hour	8.000	8.000	8.000
Bending Machine	hour	8.000	8.000	8.000
Electric generator 15 KVA	hour	8.000	8.000	8.000

Tipper

Tipper for Transportation

(i) 18 cum capacity	t.km	8 x L		
(ii) 14 cum capacity	t.km		8 x L	
(iii) 10 cum capacity	t.km			8 x L
Loading & Unloading Time	hour			
(i) 18 cum capacity	hour	1.000		
(ii) 14 cum capacity	hour		1.280	
(iii) 10 cum capacity	hour			1.778

Light weight Crane

At cutting bending yard	hour	2.000	2.000	2.000
At site	hour	2.000	2.000	2.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
14.03	1800	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications Unit = MT Taking output = 0.377 MT Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)					
		a) Material					
		H.T. Strand @ 9.42 kg/m including 2 Percent for wastage and extra length for jacking	tonne	0.385	0.385	0.385	
		Sheathing duct ID 66 mm along with 5 Percent extra length 40 x 1.05 = 42 m.	metre	42.000	42.000	42.000	
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.000	2.000	2.000	
		Cement for grouting including 3 Percent wastage @ 3.00 kg/m = 3 x 1.03 x 40 = 123.60 kg (say, = 125 kg) Add 0.50 Percent cost of material for Spacers, Insulation tape and miscellaneous items	tonne	0.125	0.125	0.125	
		b) Labour					
		i) For making and fixing cables, anchorages					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		ii) For prestressing					
		Mate/Supervisor	day	0.067	0.067	0.067	
		Prestressing operator / Fitter	day	0.333	0.333	0.333	
		Mazdoor	day	1.330	1.330	1.330	
		iii) For grouting					
		Mate/Supervisor	day	0.067	0.067	0.067	
		Mason	day	0.333	0.333	0.333	
		Mazdoor	day	1.330	1.330	1.330	
		c) Machinery					
		Stressing jack with pump	hour	2.500	2.500	2.500	
		Grouting pump with agitator	hour	1.000	1.000	1.000	
		Generator 33 KVA.	hour	3.500	3.500	3.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 0.377 MT (a+b+c+d+e)					
		Rate per MT = (a+b+c+d+e)/0.377					
		Note Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.					
14.04	2702	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.01 excluding formwork	cum	1.000	1.000	1.000	
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.075	0.075	0.075	
		b) Labour					
		Mazdoor for cleaning deck slab concrete surface.	day	1.330	1.330	1.330	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																							
				Large	Medium	Small																																								
14.05	516 & 2702	<p>Mastic Asphalt</p> <p>Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-39, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 516.</p> <p>Unit = sqm Taking output = 72.46 sqm (2 tonnes) (0.869 cum) assuming a density of 2.3 tonnes/cum.</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.652</td><td>0.652</td><td>0.652</td></tr><tr><td>Mazdoor</td><td>day</td><td>14.630</td><td>14.630</td><td>14.630</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>1.663</td><td>1.663</td><td>1.663</td></tr></table> <p>b) Machinery</p> <table><tr><td>Mechanical broom @ 1250 sqm per hour</td><td>hour</td><td>0.060</td><td>0.060</td><td>0.060</td></tr><tr><td>Air compressor 250 cfm</td><td>hour</td><td>0.060</td><td>0.060</td><td>0.060</td></tr><tr><td>Mastic cooker 1 tonne capacity</td><td>hour</td><td>6.000</td><td>6.000</td><td>6.000</td></tr><tr><td>Bitumen boiler 1500 litres capacity</td><td>hour</td><td>6.000</td><td>6.000</td><td>6.000</td></tr><tr><td>Tractor for towing and positioning of mastic cooker and bitumen boiler</td><td>hour</td><td>1.000</td><td>1.000</td><td>1.000</td></tr></table> <p>c) Material Base mastic (without coarse aggregates) = 60 Percent Coarse aggregate</p>	Mate	day	0.652	0.652	0.652	Mazdoor	day	14.630	14.630	14.630	Mazdoor (Skilled)	day	1.663	1.663	1.663	Mechanical broom @ 1250 sqm per hour	hour	0.060	0.060	0.060	Air compressor 250 cfm	hour	0.060	0.060	0.060	Mastic cooker 1 tonne capacity	hour	6.000	6.000	6.000	Bitumen boiler 1500 litres capacity	hour	6.000	6.000	6.000	Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	1.000	1.000				
Mate	day	0.652	0.652	0.652																																										
Mazdoor	day	14.630	14.630	14.630																																										
Mazdoor (Skilled)	day	1.663	1.663	1.663																																										
Mechanical broom @ 1250 sqm per hour	hour	0.060	0.060	0.060																																										
Air compressor 250 cfm	hour	0.060	0.060	0.060																																										
Mastic cooker 1 tonne capacity	hour	6.000	6.000	6.000																																										
Bitumen boiler 1500 litres capacity	hour	6.000	6.000	6.000																																										
Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	1.000	1.000																																										

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(3.35mm to 9.5 mm size) = 40 Percent. Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRR I for a specific case)					
		i) Bitumen 80/100 or 60/70 or 30/40 @ 10.2 Percent by weight of mix. $2 \times \frac{10.2}{100} = 0.204$	tonne	0.204	0.204	0.204	
		ii) Crusher stone dust @ 31.9 Percent by weight of mix $= 2 \times \frac{31.9}{100} = 0.638$ tonnes = $\frac{0.638}{1.625} = 0.39$	cum	0.390	0.390	0.390	
		iii) Lime stone dust filler with calcium carbonate content not less than 80 Percent by weight @ 17.92 Percent by weight of mix $= 2 \times \frac{17.92}{100} = 0.36$	tonne	0.360	0.360	0.360	
		iv) Coarse aggregates 9.5 mm to 3.35 mm size @ 40 Percent by weight of mix $= 2 \times \frac{40}{100} = 0.8$ MT = $\frac{0.8}{1.456} = 0.55$	cum	0.550	0.550	0.550	
		v) Pre-coated stone chips of 9.5 mm nominal size for skid resistance = $\frac{72.46 \times 0.005}{10} = 0.036$	cum	0.036	0.036	0.036	
		vi) Bitumen for coating of chips @ 2 Percent by weight $= 0.036 \times 1.456 \times \frac{2}{100} = 0.001048$ MT = 1.05kg	kg	1.050	1.050	1.050	
		d) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 72.46 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/72.46					

- Note**
1. The rates for 6 mm or any other thickness may be worked out on pro-rata basis.
 2. Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.
 3. The quantities of binder, filler and aggregates are for estimating purpose. Exact

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

quantities shall be as per mix design.

4. This rate analysis is based on design made by CRR1 for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.
5. The quantity of bitumen works out 17 Percent of the mastic asphalt blocks without aggregates and falls within the standards laid down by MoRTH Specifications.

**14.06 2703,
1500,
1600 &
1700**

**Construction of precast
RCC railing of M30
Grade, aggregate size
not exceeding 12 mm,
true to line and grade,
tolerance of vertical RCC
post not to exceed 1 in
500, centre to centre
spacing between vertical
post not to exceed 2000
mm, leaving adequate
space between vertical
post for expansion,
complete as per
approved drawings and
technical specifications.**

Unit = 1 RM

**Taking output = 2 x 24 m
span = 48 m**

a) Material

Cement	cum	4.092	4.092	4.092
concreteM30				
Grade Refer				
relevant item of				
concrete in Item				
14.01(C) by using				
batching plant,				
excluding				
formwork i.e. per				
cum basic cost				
(a+b+c)				
No. of vertical				
posts = (12 + 2)2 =				
28 Nos., External				
area of vertical				
post 0.25x0.275 =				
0.069sqm,				
Concrete in Vertical				
posts = 0.069 x 28 =				
1.932 cum, Hand				
rail in 3 tiers = 3 x				
24 = 72 m, External				
area = 0.170 x				
0.175 = 0.03 sqm,				
Concrete in hand				
rails = 0.03 x 72 =				
2.16 cum, Total				
Concrete = 1.932 +				
2.16 = 4.092 cum.				
Add 5 Percent of				

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		above cost for form work for casting in casting yard.					
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.865	0.865	0.865	
		Add 5 Percent of (a) for handling and fixing of precast panels in position					
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate for 48 m (a+b+c)					
		Rate per metre (a+b+c)/48					
Note							
1. Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.							
2. 48 m length is the total linear length adding both sides of 24 m span.							
14.07	2703, 1500, 1600 & 1700	Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications. Unit = 1 RM Taking output = 2 x 24 m span = 48 m. a) Material Cement concrete M30 Grade Refer relevant item of concrete in Item 14.01(C) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c) No. of vertical posts = $(12 + 2)2 = 28$ Nos., External					
		Cement concrete M30	cum	4.092	4.092	4.092	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		area of vertical post 0.25x0.275 = 0.069sqm, Concrete in vehicle posts = 0.069 x 28 = 1.932 cum, Hand rail in 3 tiers = 3 x 24 = 72 m, External area = 0.170 x 0.175 = 0.03 sqm, Concrete in hand rails = 0.03 x 72 = 2.16 cum, Total Concrete = 1.932 + 2.16 = 4.092 cum. Add 12 Percent of above cost for form work.					
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.865	0.865	0.865	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate for 48 m (a+b+c)					
		Rate per metre (a+b+c)/48					
		Note					
		1. Quantities of material have been calculated as per above assumption.					
		2. 48 m length is the total linear length adding both sides of 24 m span.					
14.08	2703.2 & 1900	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification Unit = 1 RM Taking output = 2 x 50 m span = 100 m					
		a) Material:					
		1) ISMC 100 = 2.806 x 1.05 = 2.946 MT	tonne	2.946	2.946	2.946	
		2) MS Flat = 0.964 x 1.05 = 1.012 MT	tonne	1.012	1.012	1.012	
		3) MS bars = 0.17 x 1.05 = 0.180 MT	tonne	0.180	0.180	0.180	
		4) MS bolts, nuts and washers	tonne	0.150	0.150	0.150	
		Add @ 5 Percent of cost of material for painting one shop coat with red oxide primer and three coats of synthetic					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		enamel paint and consumables to safeguard against weathering and corrosion. Add for cost of concrete for fixing vertical posts in the performed recess @ 1 Percent of cost of material. Add for electricity charges, welding and drilling equipment, electrodes and other consumables @ 1 Percent of cost of material.					
		b) Labour					
		Mate	day	3.724	3.724	3.724	
		Mazdoor (Skilled)	day	39.900	39.900	39.900	
		Mazdoor	day	53.200	53.200	53.200	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 m steel railing = a+b+c+d					
		Rate per metre (a+b+c+d)/100					
14.09	2705	Drainage Spouts complete as per drawing and Technical specification Unit = 1 No. Taking output = 1 No.					
		a) Material					
		Corrosion resistant Structural steel including 5 Percent wastage	Kg	4.000	4.000	4.000	
		GI pipe 100mm dia	metre	6.000	6.000	6.000	
		GI bolt 10 mm Dia	each	6.000	6.000	6.000	
		Galvanised MS flat clamp	each	2.000	2.000	2.000	
		b) Labour					
		For fabrication					
		Mate	day	0.002	0.002	0.002	
		Skilled (Blacksmith, welder etc.)	day	0.027	0.027	0.027	
		Mazdoor	day	0.027	0.027	0.027	
		For fixing in position					
		Mate	day	0.011	0.011	0.011	
		Mason	day	0.013	0.013	0.013	
		Mazdoor	day	0.266	0.266	0.266	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Add @ 5 Percent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre (a+b+c+d)					
Note 1. In case of viaducts in urban areas, the drainage spouts should be connected with suitably located pipelines to discharge the surface run-off to drains provided at ground level. 2. In case of bridges, sufficient length of G.I Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.							
14.10	2700	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification Unit = 1 cum Taking output = 1 cum Material					
		Case I PCC Grade M15 using batching plant & Concrete pump Concrete, Rate as per item No. 12.08 (A) excluding formworks cum 1.000 Concrete, Rate as per item No. 12.08 (A) excluding formworks 1.000 Concrete, Rate as per item No. 12.08 (A) excluding formworks 1.000 Rate per cum					
		Case II PCC Grade M15 using batching plant & manual placing Concrete, Rate as per item No. 12.08 (A) excluding formworks cum 1.000 Concrete, Rate as per item No. 12.08 (A) excluding formworks 1.000 Concrete, Rate as per					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		item No. 12.08 (A) excluding formworks Rate per cum					
14.11	1500,16 00,1700 & 2704	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification Unit = 1 cum Taking output = 1 cum					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in item 12.08(G) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c) (Excluding OH & CP) (Refer relevant item of concrete in item No. 13.08 (G) except that form work may be added at the rate of 2 Percent of cost against 3.5 Percent provided in the foundation concrete.	cum	1.000	1.000	1.000	
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.050	0.050	0.050	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per cum (a+b+c)					
		Note The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.					
14.12	1600	Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) Unit = MT Taking output = 1 MT					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

To be taken as per the prevailing market rates.

Note Contractors generally do not have expertise for this item. The job is therefore, got done from specialized firms who have the expertise in the field of construction chemicals. The prevailing rate in the market is required to be ascertained from the market and added in the cost estimate. HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) as per MoRTH circular /specification.

14.13 1800 & 2300

Precast - pretensioned Girders

Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications

Unit = cum

Taking output = 1 cum

Grade of concrete - M40

a) Material

Per Cum Basic Cost (Rate as in sub-analysis)	cum	1.000	1.000	1.000
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Water for curing	Kl	0.525	0.525	0.525
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HYSD steel.	tonne	0.100	0.100	0.100
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HT strand with 5 Percent as wastage and extra length for anchoring	tonne	0.060	0.060	0.060
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LDO for steam curing	Litre	37.000	37.000	37.000
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Add consumables such as binding wire, foam, packing tape, shuttering oil, HDPE pipe for unbonding of strand, bolt & nuts etc @ 1 Percent of material cost

b) Labour

(i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete

Taking quantity of steel 100 Kg/cum of concrete including laps and wastage

Mate	day	0.093	0.093	0.093
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Mazdoor (Skilled)	day	0.466	0.466	0.466
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Mazdoor	day	1.862	1.862	1.862
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc., prestressing and cutting of extra length of HT strand after de-stressing.					
		<i>Taking quantity of HT strand 60 Kg/cum</i>					
		Mate	day	0.027	0.027	0.027	
		Mazdoor (Skilled)	day	0.186	0.186	0.186	
		Mazdoor	day	0.500	0.500	0.500	
		(iii) Erection and dismantling of shuttering					
		<i>Taking shuttering area 10 sqm/cum of concrete</i>					
		Mate	day	0.120	0.120	0.120	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		Mazdoor	day	2.000	2.000	2.000	
		(iv) Concreting by Batching plant and stationary concrete pump					
		Mate	day	0.026	0.026	0.026	
		Mazdoor (Skilled)	day	0.050	0.050	0.050	
		Mazdoor	day	0.600	0.600	0.600	
		(v) Steam curing and manual curing					
		Mate	day	0.014	0.014	0.014	
		Mazdoor	day	0.350	0.350	0.350	
		(vi) Handling of precast girder, stacking in stockyard and again loading in trailer					
		Mate	day	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.					
		Mate	day	0.012	0.012	0.012	
		Mazdoor (Skilled)	day	0.060	0.060	0.060	
		Mazdoor	day	0.240	0.240	0.240	
		c) Machinery					
		i) At casting yard					
		Transit truck					
		agitator					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	2.5 x L1	2.5 x L1	2.5 x L1	
		For unloading	hour	0.024	0.024	0.024	
		Hydraulic Boom placer pump	hour	0.024	0.024	0.024	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.022			
		(ii) 12 KL capacity	hour		0.01 x L1 + 0.029		
		(iii) 6 KL capacity	hour			0.019 x L1 + 0.058	
		Crane 35 tonne capacity	hour	0.100	0.100	0.100	
		Trailor 30 tonne capacity	hour	0.100	0.100	0.100	
		ii) For transportation and placement at site					
		Crane 35 tonne capacity	hour	0.150	1.150	2.150	
		Trailer 30 tonne capacity for transporting to site. (L1 - Lead in Kilometer)	tonne.km	2.5xL1	2.5xL1	2.5xL1	
		Trailer 30 tonne capacity during placement.	hour	0.150	1.150	2.150	
		Cost of formwork, steam curing arrangement, pretensioning arrangement etc @ 5 Percent of cost material, labour and machinery					
		d) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
14.14	1700 & 1800	Providing and fixing Helical pipes in voided concrete slabs					
		Unit = RM					
		Taking output = 1 RM					
		a) Material					
		Helical pipes 600mm diameter	metre	1.000	1.000	1.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tie rods 20mm diameter	each	1.000	1.000	1.000	
		Consumables for sealing joints etc.@ 5 Percent of cost of material					
		b) Labour					
		Mate	day	0.010	0.010	0.010	
		Fitter	day	0.050	0.050	0.050	
		Mazdoor	day	0.200	0.200	0.200	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum (a+b+c+d)					
14.15	800	Crash Barriers for Bridge					
		Provision of an Reinforced cement concrete crash barrier at the bridge decks & approaches to bridge structures, constructed with Reinforced Cement Concrete with HYSD reinforcement conforming MoRT&H Specification and as per details given IRC -5 including dowel bars , expansion joints filled with pre-moulded asphalt filler board etc. and approved drawing and at locations directed by the Engineer, all as specified.					
		Unit = Linear metre					
		Taking output = 10 m					
	A	Crash Barriers for Bridge (Height 950 mm) as per details given IRC -5 (fig.- 1) (Area-0.254 Sqm. for 1 meter length)					
		a) M40 grade concrete & HYSD steel reinforcement					
		M 40 grade concrete (Area- 0.254 Sqm. /Meter)	cum	2.540	2.540	2.540	
		(Rate taken from item No. 14.01 E (p) including OH & CP)					
		HYSD steel	tonne	0.229	0.229	0.229	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		reinforcement including dowel bars(Rate taken from item No. 14.02 including OH & CP)					
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		c) Material					
		Pre-moulded asphalt filler board	sqm	0.265	0.265	0.265	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 10 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/10					
14.15	B	Crash Barriers for Bridge (Height 1100 mm) as per details given IRC -5 (fig.-2) (Area-0.298 Sqm. for 1 meter length)					
		a) M40 grade concrete & HYSD steel reinforcement					
		M 40 grade concrete (Area-0.298 Sqm. /Meter)	cum	2.980	2.980	2.980	
		(Rate taken from item No. 14.01 E (p) including OH & CP)					
		HYSD steel reinforcement including dowel bars (Rate taken from item No. 14.02 including OH & CP)	tonne	0.268	0.268	0.268	
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		c) Material					
		Pre-moulded asphalt filler board	sqm	0.310	0.310	0.310	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 10 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/10					
14.15	C	Crash Barriers for Bridge (Height 1550 mm) as per details given IRC -5 (fig.-3) (Surface Area-0.514 Sqm. for 1 meter length)					
		a) M40 grade concrete & HYSD steel					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		reinforcement					
		M 40 grade concrete (Area-0.514 Sqm. /Meter) (Rate taken from item No. 14.01 E (p) including OH & CP)	cum	5.140	5.140	5.140	
		HYSD steel reinforcement including dowel bars (Rate taken from item No. 14.02 including OH & CP)	tonne	0.463	0.463	0.463	
		b) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	1.995	1.995	1.995	
		c) Material					
		Pre-moulded asphalt filler board	sqm	0.540	0.540	0.540	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 10 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/10					
		Note:- The rate analysis for semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.					
14.16	800	Painting on concrete surface Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 sqm. Unit = sqm Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.020	0.020	0.020	
		Painter	day	0.250	0.250	0.250	
		Mazdoor (Skilled)	day	0.250	0.250	0.250	
		b) Material					
		Water based paint of approved quality for cement concrete surface	Litres	5.000	5.000	5.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost for 10 sqm (a+b+c+d) Rate per sqm (a+b+c+d)/10					
14.17	2604	Filler joint (i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification. Unit = Running meter Taking output = 12 m a) Labour Cutting, bending, carrying & fixing etc. Mate day 0.040 0.040 0.040 Mazdoor day 0.500 0.500 0.500 Mazdoor (Skilled) day 0.500 0.500 0.500 b) Material Copper plate - 12m long x 250 mm wide Area = 12 x 0.25 = 3 sqm Weight = 3 x 0.002 x 8900 = 53.4 kg Wastage @ 2.5 Percent = 1.33 kg/54.73 kg say = 55 kg. c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) (a+b+c)					
		Cost for 12 m = (a+b+c+d) Rate per m = (a+b+c+d)/12					
14.17		(ii) Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification. Unit = Running meter Taking output = 12 m a) Labour For carrying, placing & fixing. Mate day 0.008 0.008 0.008 Mazdoor day 0.100 0.100 0.100 Mazdoor (Skilled) day 0.100 0.100 0.100 b) Material 20 mm thick compressible fibre board 12 m long x 25 cm deep. Area = 12 x 0.25 = 3 sqm c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit Cost for 12 m = (a+b+c+d) Rate per m = (a+b+c+d)/12		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
14.17	(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications. Unit = Running meter Taking output = 12 m					
		a) Labour					
		Mate	day	0.012	0.012	0.012	
		Mazdoor	day	0.200	0.200	0.200	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		b) Material					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.600	3.600	3.600	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d) Rate per m = (a+b+c+d)/12					
14.17	(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 Percent bitumen by weight Unit = Running meter Taking output = 12 m 12m long x 100 mm wide x 10mm deep recess					
		a) Labour					
		Mate	day	0.024	0.024	0.024	
		Mazdoor	day	0.500	0.500	0.500	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		b) Material					
		Sand	cum	0.012	0.012	0.012	
		Volume 12 x 0.1 x 0.01 = 0.012 cum					
		Weight 0.012 x 1400 = 16.8kg					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Bitumen 16.8 x 0.06 = 1 kg	cum	0.001	0.001	0.001	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
		Note For arriving at the final rate of filler joints per m length and per cm depth of joint filling compound, the rates at Sl. No. i), ii), iii) & iv) shall be added					
14.18	2600	Asphaltic Plug joint Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of weldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/ backer rod, all as per approved drawings and specifications. Unit = Running meter Taking output = 12 m					
		a) Labour					
		Mate	day	0.052	0.052	0.052	
		Mazdoor	day	1.000	1.000	1.000	
		Mazdoor (Skilled)	day	0.300	0.300	0.300	
		b) Material					
		Crushed stone aggregate 12.5 mm nominal size	cum	0.750	0.750	0.750	
		Polymer modified bitumen	kg	77.500	77.500	77.500	
		Galvanised structural steel plate 200 mm wide, 6 mm thick, 12 m long (2.4 sqm) @ 47.10	kg	113.000	113.000	113.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		kg/sqm including 5 Percent wastage Add 1 Percent for welding and foam caulking/backer rod and other incidentals.					
		c) Machinery					
		Mastic cooker 1 tonne capacity	hour	1.000	1.000	1.000	
		Smooth 3-wheeled steel roller 8-10 capacity	hour	0.500	0.500	0.500	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m asphalt plug joint = (a+b+c+d+e)					
		Rate per m = (a+b+c+d+e)/12					
		Note The nominal size of aggregates shall be 12.5 mm for depth of joint upto 75 mm and 20 mm for joints of depth more than 75 mm.					
14.19	2605	Elastomeric Slab Steel Expansion Joint Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation and clause 2605 of MoRTH specifications for road & bridge works. Unit = Running meter Taking output = 12 m					
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mazdoor	day	1.000	1.000	1.000	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		b) Material					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Supply of elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II), complete as per approved drawings and standard specification conforming to clause 2605 of MoRT&H Specification Add 5 Percent of cost of material for anchorage reinforcement, welding and other incidentals.	metre	12.000	12.000	12.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
14.20	2608	Compression Seal Joint Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm. Unit = Running meter Taking output = 12 m					
		a) Labour					
		Mate	day	0.036	0.036	0.036	
		Mazdoor	day	0.600	0.600	0.600	
		Mazdoor (Skilled)	day	0.300	0.300	0.300	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		1. Galvanised angle sections 100mm x 100mm of 12mm thickness weldable structural steel as per IS: 2062, 2 nos. of 12 m length each @ 17.7 kg/m and 5 Percent wastage. Add 5 Percent of cost of above for structural steel for anchorage, welding and other incidentals.	kg	446.000	446.000	446.000	
		Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness. Add 1 Percent of cost of sealing element for lubricant-cum-adhesive and other consumables.	metre	12.000	12.000	12.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
		Note					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.21	2607	Strip Seal Expansion Joint Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation. Unit = Running meter Taking output = 12 m					
		a) Labour					
		Mate	day	0.050	0.050	0.050	
		Mazdoor	day	1.000	1.000	1.000	
		Mazdoor (Skilled)	day	0.250	0.250	0.250	
		b) Material					
		Supply of complete assembly of strip seal expansion joint comprising of edge beams, anchorage, strip seal element and complete accessories as per approved specifications and drawings. Add 5 Percent of cost of material for anchorage reinforcement, welding and other incidentals.	metre	12.000	12.000	12.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
		Note					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
14.22	2600	Modular Strip / Box Seal Joint Providing and laying of a modular strip Box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, complete as per approved drawings and standard specifications to					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Mate	day	0.056	0.056	0.056	
		Mazdoor	day	1.000	1.000	1.000	
		Mazdoor (Skilled)	day	0.400	0.400	0.400	
		b) Material					
		Supply of a modular strip/box seal joint assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.000	12.000	12.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
Note							
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.23	2600	Modular Strip / Box Seal Joint Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, complete as per approved drawings and standard specifications					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Unit = Running meter

Taking output = 12 m

a) Labour

Mate	day	0.077	0.077	0.077
Mazdoor	day	1.250	1.250	1.250
Mazdoor (Skilled)	day	0.665	0.665	0.665

b) Material

Supply of a modular box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.000	12.000	12.000
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c) Overhead charges

@ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 12 m Modular strip/box seal joint = (a+b+c+d)

Rate per m = (a+b+c+d)/12

- Note**
1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.
 2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.
 3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.

14.24

Painting with synthetic enamel paint bridge No. and span arrangements

Painting two coats after filling the surface with synthetic enamel paint bridge No. and span arrangements as per as directed by Engineer.

Unit = Nos.

Taking output = 1 Nos.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.008	0.008	0.008	
		Painter	day	0.133	0.133	0.133	
		Mazdoor	day	0.067	0.067	0.067	
		b) Material					
		Paint conforming to requirement of clause 803.3.	Litre	0.300	0.300	0.300	
		Add for scaffolding @ 1 Percent of labour cost where required					
		Add @ 5 Percent cost of labour and materials to prepare the surface by filling minuts roughness on the surface and priming the surface before laying 2 coats of painting.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per Nos. = (a+b+c+d)					
14.25	Suggestive	Bipolar corrosion inhibiting admixture in concrete for protection of reinforced steel from corrosion Admix polydentate, bipolar, migratory, integral, non nitrite base concrete penetrating corrosion inhibiting admixture at a dosage of 3 Kg per cu.m. Of concrete as per manufacturers specification. Inhibitor should conform to following i. ASTM G-109-2005- Long term corrosion test resulting in a corrosion rate of zero coulombs. ii. JIS Z 1535- Accelerated corrosion test showing significant reduction in corrosion using the admixture. iii. ASTM G1- Immersion test for 720 hrs indicating rebar weight loss less					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		than 5 mpy iv. ASTM G3- Polarization test by Tafel test indicating Rebar weight loss of less than 5 mpy Unit = Cum. Taking output = 100.00 Cum a) Material Corrosion Inhibiting Admixture @ 3 kg per cubic Meter b) Overhead charges c) Contractor's profit Cost for 100 cum. = a+b+c Rate per cum = (a+b+c)/100					
14.26	1700	Providing structural steel for super-structure complete as per drawing and technical specifications Unit = MT Taking output = 17.135 MT a) Material Structural steel in plates, angles, etc including 5 Percent wastage Nuts & bolts b) Labour (for cutting, bending, making holes, joining, welding and erecting in position) Mate Fitter Blacksmith Welder Painter I class Mazdoor Electrodes, cutting gas and other consumables @ 10 Percent of cost of (a) above c) Machinery Mobile Hydraulic Crane 10 tonne capacity (For Fabrication) Crane 35 tonne capacity (For					
			Kg.	300.000	300.000	300.000	
				@ on (a)	@ on (a)	@ on (a)	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	
			tonne	17.992	17.992	17.992	
			Kg	180.000	180.000	180.000	
			day	28.058	28.058	28.058	
			day	102.553	102.553	102.553	
			day	102.553	102.553	102.553	
			day	102.553	102.553	102.553	
			day	43.072	43.072	43.072	
			day	350.731	350.731	350.731	
			Hrs	68.540	68.540	68.540	
			Hrs	4.000	4.000	4.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Loading & Unloading @ 1 hr for each operation)					
		Crane 35 tonne capacity (For Lifting and Placing in Position @ 2 hrs)	Hrs	4.000	4.000	4.000	
		Trailer 30 tonne capacity for transporting to site.	Hrs	4+L/15	4+L/15	4+L/15	
		Applying 2 coats primer before painting of Truss and Girder (42 sqm/tonne)	Lit	899.588	899.588	899.588	
		Painting of Truss and Girder	Lit	899.588	899.588	899.588	
		Sundries @ 5% of the above (a,b & c)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 17.135 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/17.135					

CHAPTER – 15

BOX CELL STRUCTURES

PREAMBLES:

- 1 Excavation for structures has been provided both by manual and mechanical means. The rate relevant to a particular situation may be adopted.
- 2 The earth excavated from foundation has been proposed to be backfilled and balance quality utilized for road work locally except for marshy soil where disposal has been provided.
- 3 The rock foundations are required to be prepared which has been analysed.
- 4 In case of rocks, excavation has been considered upto a depth of 3 m only.
- 5 Embedment of foundation in soft and hard rocks has been provided as required by the specifications.
- 6 Mixing of cement concrete has been considered by using batching plant.
- 7 Concrete batching plant is generally placed within one km of the Box Cell site. In case of longer lead, transportation cost may be worked out based on tonne Km
- 8 The coarse and fine aggregate for cement concrete shall be as per IS: 383.
- 9 Description of items has been given very brief. Relevant clauses of MoRT&H Specifications may be referred for detailed specification.
- 10 Filter media and backfilling behind abutments are required to be provided as per guidelines given in IRC: 78.
- 11 Weep holes shall be provided as per Clause 2706 of MoRT&H Specifications.

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	304	Excavation for Structures Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.					
		I Ordinary soil Unit = cum Taking output = 10 cum					
		A Manual Means (i) Depth upto 3 m					
		a) Labour					
		Mate	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note 1. Cost of dewatering may be added where required upto, 10 Percent of labour cost Assessment for dewatering shall be made as per site conditions. 2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 15.01 excluding marshy soil. 3. The cost of shoring and shuttering, where needed, may be added @ 1 Percent on cost of excavation for open foundation.					
15.01	A	(ii) Depth 3 m to 6 m					
		a) Labour					
		Mate/Supervisor	day	0.239	0.239	0.239	
		Mazdoor	day	5.985	5.985	5.985	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
		Note Cost of dewatering may be added where required upto 15 Percent of labour cost. Assessment for dewatering shall be done as per actual ground conditions.					
15.01	A	(iii) Depth above 6 m					
		a) Labour					
		Mate/Supervisor	day	0.319	0.319	0.319	
		Mazdoor	day	7.980	7.980	7.980	

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

b) Overhead charges	@ on (a)	@ on (a)	@ on (a)
c) Contractor's profit	@ on (a+b)	@ on (a+b)	@ on (a+b)
Cost for 10 cum = a+b+c			
Rate per cum = (a+b+c)/10			

Note 1. Cost of dewatering may be added where required upto 20 Percent of labour cost. Assessment for dewatering shall be made as per site conditions.

15.01	B	(i) Mechanical Means (Depth upto 3 m)					
		Unit = cum					
		Taking output = 330 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	5.508			
		(ii) 1.1 cum bucket capacity	hour		6.344		
		(iii) 0.9 cum bucket capacity	hour			8.869	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.305			
		(ii) 1.1 cum bucket capacity	hour		3.806		
		(iii) 0.9 cum bucket capacity	hour			5.321	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 14 cum capacity	t-km	198.000			
		(ii) 14 cum capacity	t-km		198.000		
		(iii) 10 cum capacity	t-km			198.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 330 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 330					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	B	(ii) Mechanical Means (Depth 3 m to 6 m) Unit = cum Taking output = 300 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	5.564			
		(ii) 1.1 cum bucket capacity	hour		6.408		
		(iii) 0.9 cum bucket capacity	hour			8.958	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.338			
		(ii) 1.1 cum bucket capacity	hour		3.845		
		(iii) 0.9 cum bucket capacity	hour			5.375	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 14 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/300					
15.01	B	(iii) Mechanical Means (Depth above 6 m) Unit = cum Taking output = 270 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	5.634			
		(ii) 1.1 cum bucket capacity	hour		6.488		
		(iii) 0.9 cum bucket capacity	hour			9.070	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.380			
		(ii) 1.1 cum bucket capacity	hour		3.893		
		(iii) 0.9 cum bucket capacity	hour			5.442	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 14 cum capacity	t-km	162.000			
		(ii) 14 cum capacity	t-km		162.000		
		(iii) 10 cum capacity	t-km			162.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 270 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 270					
15.01	II	Ordinary Rock (not requiring blasting)					
	A	Manual Means					
	(i)	Depth upto 3 m					
		Unit = cum					
		Taking output = 10 cum					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	6.650	6.650	6.650	
		b) Overhead charges @ on (a)					
		c) Contractor's profit @ on (a+b)					
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					
	Note	Cost of dewatering upto 10 Percent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions.					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	B	Mechanical Means <i>Unit = cum</i> <i>Taking output = 50 cum</i>					
	a)	Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
	b)	Machinery					
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	6.926			
		(ii) 1.1 cum bucket capacity	hour		8.149		
		(iii) 0.9 cum bucket capacity	hour			8.658	
		For loading					
		(i) 1.2 cum bucket capacity	hour	1.039			
		(ii) 1.1 cum bucket capacity	hour		1.196		
		(iii) 0.9 cum bucket capacity	hour			1.672	
		Jack Hammer	hour	6.926	8.149	8.658	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 14 cum capacity	t-km	75.000			
		(ii) 14 cum capacity	t-km		75.000		
		(iii) 10 cum capacity	t-km			75.000	
		For loading & unloading time					
		(i) 14 cum capacity	hour	1.039			
		(ii) 14 cum capacity	hour		1.196		
		(iii) 10 cum capacity	hour			1.672	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 50 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 50					
15.01	302 & 303	III Hard Rock (requiring blasting)					
	A	Manual Means <i>Unit = cum</i> <i>Taking output = 10 cum</i>					
	a)	Labour					
		Mate	day	0.459	0.459	0.459	
		Driller	day	0.500	0.500	0.500	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	10.640	10.640	10.640	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.000	1.000	1.000	
		c) Material					
		Explosives (Blasting Material)	kg	3.500	3.500	3.500	
		Detonator electric	each	14.000	14.000	14.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Cost for 10 cum = a+b+c+d+e

Rate per cum = (a+b+c+d+e)/10

Note Cost of dewatering @ 10 Percent of (a+b) may be added, where required Assessment for dewatering shall be made as per site conditions.

15.01 302 & 303

III Hard Rock (requiring blasting)

Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303

B Mechanical Means

Unit = cum

Taking output = 120 cum

a) Labour

Mate	day	0.253	0.253	0.253
Mazdoor	day	3.990	3.990	3.990
Driller	day	2.000	2.000	2.000
Blaster	day	0.333	0.333	0.333

b) Machinery

Air compressor	hour	6.000	6.000	6.000
Jack Hammer for drilling holes (@ 4.5 m per hour)	hour	24.000	24.000	24.000
Jack Hammer (consider 5% of the volume for dressing)	hour	1.219	1.219	1.219

Hydraulic Excavator

Excavator for excavation

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	1.219			
		(ii) 1.1 cum bucket capacity	hour		1.219		
		(iii) 0.9 cum bucket capacity	hour			1.219	
		For loading					
		(i) 1.2 cum bucket capacity	hour	2.493			
		(ii) 1.1 cum bucket capacity	hour		2.871		
		(iii) 0.9 cum bucket capacity	hour			4.013	
		Tipper					
		For transportation considering lead @ 1 km					
		(i) 14 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		For loading & unloading time					
		(i) 14 cum capacity	hour	2.493			
		(ii) 14 cum capacity	hour		2.871		
		(iii) 10 cum capacity	hour			4.013	
		c) Materials					
		Small dia.Explosive at 0.40 kg / cum for 120 cum (120 x 0.40)	kg	48.000	48.000	48.000	
		Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (120 x 0.2x5%)					
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos	no	69.000	69.000	69.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes (required for 5% of the total quantity @ 0.6 m per hole for I cum)	no	7.000	7.000	7.000	
		Detonating fuse coil	m	213.000	213.000	213.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 120 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/120					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	IV	Hard Rock (blasting prohibited) Unit = cum Taking output = 35 cum					
	A	Mechanical Means					
	a)	Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
	b)	Machinery					
		Jack Hammer	hour	7.111	8.889	10.940	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	7.111			
		(ii) 1.1 cum bucket capacity	hour		8.889		
		(iii) 0.9 cum bucket capacity	hour			10.940	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.727			
		(ii) 1.1 cum bucket capacity	hour		0.837		
		(iii) 0.9 cum bucket capacity	hour			1.171	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t-km	52.500			
		(ii) 14 cum capacity	t-km		52.500		
		(iii) 10 cum capacity	t-km			52.500	
		For loading & unloading time					
		(i) 14 cum capacity	hour	0.727			
		(ii) 14 cum capacity	hour		0.837		
		(iii) 10 cum capacity	hour			1.171	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 35 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/35					
15.01	V	Marshy Soil Unit = cum Taking output = 10 cum Depth upto 3 m					
	A	Manual means					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate/Supervisor	day	0.532	0.532	0.532	
		Mazdoor	day	13.300	13.300	13.300	
		b) Machinery					
		Tractor-trolley for removal.	hour	2.670	2.670	2.670	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

Cost for 10 cum = a+b+c+d

Rate per cum = (a+b+c+d)/ 10

- Note**
1. Cost of dewatering @ 30 Percent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.
 2. Shoring & strutting 15 Percent of (a), where required may be added
 3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item15.01 (i) to (iv) for ordinary soil

15.01

B Mechanical Means

Unit = cum

Taking output = 260 cum

a) Labour						
Mate	day	0.053	0.053	0.053		
Mazdoor	day	1.330	1.330	1.330		
b) Machinery						
Hydraulic Excavator						
(i) 1.2 cum bucket capacity	hour	10.126				
(ii) 1.1 cum bucket capacity	hour		11.662			
(iii) 0.9 cum bucket capacity	hour				16.304	
Tipper						
For transportation to dumping yard considering lead @ 1km						
(i) 14 cum capacity	t-km	390.000				
(ii) 14 cum capacity	t-km		390.000			
(iii) 10 cum capacity	t-km				390.000	
For loading & unloading time						
(i) 14 cum capacity	hour	10.126				
(ii) 14 cum capacity	hour		11.662			
(iii) 10 cum capacity	hour				16.304	
c) Material						
Selected earth for refilling	cum	156.000	156.000	156.000		
d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		

Cost for 260 cum = a+b+c+d

Rate per cum = (a+b+c+d)/ 260

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	VI	Back Filling in Marshy Foundation Pits Unit = Cum Taking Output = 6 cum					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor for dressing sides, bottom and backfilling	day	3.990	3.990	3.990	
		b) Machinery					
		Tractor-trolley for transportation	hour	2.000	2.000	2.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 6 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/6					
15.02	304	Filling Annular Space Around Footing in Rock Unit = cum Taking out put = 1 cum PCC-15 nominal mix. Rate may be taken as per item 15.11.					
15.03	304	Sand Filling in Foundation Trenches as per Drawing & Technical Specification Unit = cum Taking output = 100 cum					
		a) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		b) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.125 x L1 + 0.750			
		(ii) 12 KL capacity	hour		0.167 x L1 + 1.000		
		(iii) 6 KL capacity	hour			0.333 x L1 + 2.000	
		c) Material					
		Sand (assuming 20 Percent voids) at site	cum	120.000	120.000	120.000	
		Water	KL	18.000	18.000	18.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per 100 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/100					
15.04	1300	Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications. Unit = cum Taking output = 5 cum					
		a) Material					
		Bricks 1st class	each	2500.000	2500.000	2500.000	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	1.200	1.200	1.200	
		Water for curing	KL	2.415	2.415	2.415	
		b) Labour					
		Mate	day	0.638	0.638	0.638	
		Mason	day	5.320	5.320	5.320	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.017 x L1 + 0.101			
		(ii) 12 KL capacity	hour		0.022x L1 + 0.134		
		(iii) 6 KL capacity	hour			0.045 x L1 + 0.268	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
15.05	Sub-analysis	(A) Cement Mortar 1:3 (1 cement : 3 sand) Unit = cum Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.510	0.510	0.510	
		Sand	cum	1.050	1.050	1.050	
		b) Labour					
		Mate	day	0.048	0.048	0.048	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	1.197	1.197	1.197	
		Total Material and Labour = (a+b)					
	Sub-analysis (Addl.)	(B) Cement Mortar1:2 (1 cement :2 sand)					
		Unit = cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.672	0.672	0.672	
		Sand	cum	0.930	0.930	0.930	
		b) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	1.197	1.197	1.197	
		Total Material and Labour = (a+b)					
	Sub-analysis (Addl.)	(C) Cement Mortar1:4 (1 cement :4 sand)					
		Unit = cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.403	0.403	0.403	
		Sand	cum	1.120	1.120	1.120	
		b) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	1.197	1.197	1.197	
		Total Material and Labour = (a+b)					
	Sub-analysis (Addl.)	(D) Cement Mortar1:6 (1 cement :6 sand)					
		Unit = cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.288	0.288	0.288	
		Sand	cum	1.337	1.337	1.337	
		b) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	1.197	1.197	1.197	
		Total Material and Labour = (a+b)					
15.06	1400	Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications.					
		Unit = cum					
		Taking output = 5 cum					
	1405.4 (A)	Square Rubble Coursed Rubble Masonry (first sort)					
		a) Material					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Stone	cum	5.500	5.500	5.500	
		Through and bond stone (35no.x0.24mx0.24mx0.3 9m = 0.79 cu.m)	each	35.000	35.000	35.000	
		Cement mortar 1:3 (Rate taken from sub- analysis items 21.01 A)	cum	1.500	1.500	1.500	
		b) Labour					
		Mate	day	0.878	0.878	0.878	
		Mason	day	9.975	9.975	9.975	
		Mazdoor	day	11.970	11.970	11.970	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
1405.3	(B)	Random Rubble Masonry (coursed/uncoursed) Unit = cum Taking output = 5 cum					
		a) Material					
		Stone	cum	5.500	5.500	5.500	
		Through and bond stone (35nos.x0.24mx0.24mx0. 39m = 0.79 cu.m)	each	35.000	35.000	35.000	
		Cement mortar 1:3 (Rate taken from sub- analysis items 21.01 A)	cum	1.550	1.550	1.550	
		b) Labour					
		Mate	day	0.798	0.798	0.798	
		Mason	day	7.980	7.980	7.980	
		Mazdoor	day	11.970	11.970	11.970	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
Note The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.							
15.07	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications Unit = cum Taking output = 1 cum					
		a) Material					
		Bricks 1st class	each	500.000	500.000	500.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.240	0.240	0.240	
		Water for curing	KL	0.483	0.483	0.483	
		b) Labour					
		Mate	day	0.085	0.085	0.085	
		Mason	day	1.064	1.064	1.064	
		Mazdoor	day	1.064	1.064	1.064	
		Add for scaffolding @ 5 Percent of cost of material and labour					
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.003 x L1 + 0.020			
		(ii) 12 KL capacity	hour		0.004 x L1 + 0.027		
		(iii) 6 KL capacity	hour			0.009 x L1 + 0.054	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
15.08	1300 & 2200	Pointing with cement mortar (1:3) on brick work in substructure as per Technical Specifications					
		Unit = 10 sqm					
		Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.030	0.030	0.030	
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per 10 sqm (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.09	1300 & 2200	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications Unit = 10 sqm Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.144	0.144	0.144	
		Water for curing	KL	0.139	0.139	0.139	
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.001 x L1 + 0.006			
		(ii) 12 KL capacity	hour		0.001 x L1 + 0.008		
		(iii) 6 KL capacity	hour			0.003 x L1 + 0.016	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per 10 sqm (a+b+c+d+e)					

Note:- The number of masons and Mazdoors already catered in the cement mortar have been taken into account while providing these categories in brick masonry, pointing and plastering.

15.10	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications				
		A Random Rubble Masonry (coursed/uncoursed)				
		Unit = cum				
		Taking output = 1 cum				
		a) Material				
		Stone	cum	1.000	1.000	1.000
		Through and bond stone	No	7.000	7.000	7.000
		(7 no.x 0.24 m x 0.24 m x 0.39 m = 0.16 cum)				

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)		0.330	0.330	0.330	
		Water for curing		0.966	0.966	0.966	
		b) Labour					
		Mate		0.128	0.128	0.128	
		Mason		1.596	1.596	1.596	
		Mazdoor		1.596	1.596	1.596	
		Add for scaffolding @ 5 percent of cost of material and labour					
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.040			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.018 x L1 + 0.107	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
15.10	B	Coursed rubble masonry (first sort)					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.100	1.100	1.100	
		Through and bond stone (7 no.x 0.24 m x 0.24 m x 0.39 m = 0.16 cum)	each	7.000	7.000	7.000	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.300	0.300	0.300	
		Water for curing	KL	0.966	0.966	0.966	
		b) Labour					
		Mate	day	0.160	0.160	0.160	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.995	1.995	1.995	
		Add for scaffolding @ 5 Percent of cost of material and labour					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.040			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.018 x L1 + 0.107	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
15.10	C	Ashlar masonry (first sort)					
		Plain ashlar					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.110	1.110	1.110	
		Through and bond stone (7no.x0.24mx0.24mx0.39 m = 0.16 cu.m)	each	7.000	7.000	7.000	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.330	0.330	0.330	
		Water for curing	KL	0.966	0.966	0.966	
		b) Labour for masonry work					
		Mate	day	0.266	0.266	0.266	
		Mason	day	3.325	3.325	3.325	
		Mazdoor	day	3.325	3.325	3.325	
		Add for scaffolding @ 5 Percent of cost of a) Material and b) Labour					
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.040			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.054		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.018 x L1 + 0.107	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
	Note	The labour already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.					
15.11	1500, 1700 & 2100	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.					
	A	PCC Grade M15					
	Case I	PCC Grade M15 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.03)	cum	30.000	30.000	30.000	
		Water for curing	kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.143 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292x L1 + 1.750	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
		Case II PCC Grade M15 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis items 21.03)					
		Water for curing	kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	B	PCC Grade M20					
	Case I	PCC Grade M20 using batching plant transit mixer & Concrete pump					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.04)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		PCC Grade M20 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.04)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	C	RCC Grade M20					
	Case I	RCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.05)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		RCC Grade M20 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.05)	cum	15.000	15.000	15.000	
		Water for curing	KL	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	D	PCC Grade M25					
	Case I	PCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis items 21.06)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		PCC Grade M25 using batching plant transit mixer & manual placing					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.06)	cum	15.000	15.000	15.000	
		Water for curing	KL	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	E	RCC Grade M25					
	Case I	RCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis items 21.07)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	Case II	RCC Grade M25 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.07)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	F	PCC Grade M30					
	Case I	PCC Grade M30 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.08)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
	Case II	PCC Grade M30 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.08)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	G	RCC Grade M30					
	Case I	RCC Grade M30 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.09)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		RCC Grade M30 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.09)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	H	RCC Grade M35					
		Case I RCC Grade M35 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis items 21.11)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II	RCC Grade M35 using batching plant transit mixer & manual placing <i>Unit = cum</i> <i>Taking output = 15 cum</i>	a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub- analysis items 21.11)					
		Water for curing	KL	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)	
				Large	Medium	Small		
15.11	I	Rate per cum = (a+b+c+d+e+f)/15						
		RCC Grade M40						
		Case I	RCC Grade M40 using batching plant transit mixer & Concrete pump					
			Unit = cum					
		Taking output = 30 cum						
		a) Material						
			Per Cum Basic Cost (Rate taken from sub-analysis items 21.12)	cum	30.000	30.000	30.000	
			Water for curing	Kl	15.750	15.750	15.750	
		b) Labour						
		For pouring and placing						
			Mate	day	0.206	0.206	0.206	
			Mason	day	1.995	1.995	1.995	
			Mazdoor	day	3.143	3.143	3.143	
		c) Machinery						
		Transit truck agitator						
			For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
			For unloading	hour	0.726	0.726	0.726	
			Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
			Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
			(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
			(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
			(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery						
		e) Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f						
		Rate per cum = (a+b+c+d+e+f)/30						
Case II		RCC Grade M40 using batching plant transit mixer & manual placing						
		Unit = cum						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Taking output = 15 cum							
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.12)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.559	0.559	0.559	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	11.970	11.970	11.970	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L	37.5 x L	37.5 x L	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.208 x L1 + 0.625			
		(ii) 12 KL capacity	hour		0.278 x L1 + 0.833		
		(iii) 6 KL capacity	hour			0.556 x L1 + 1.667	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
15.12	1500, 1700 & 2100	Plain/Reinforced Cement Concrete for wall & slab etc. complete as per Drawing and Technical Specifications.					
		A RCC Grade M20 RCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.05)	cum	30.000	30.000	30.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
15.12	B	RCC Grade M25					
		RCC Grade M25 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.07)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
15.12	C	RCC Grade M30					
		RCC Grade M30 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.09)	cum	30.000	30.000	30.000	
		Water for curing	kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
15.12	D	RCC Grade M35					
		RCC Grade M35 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.11)	cum	30.000	30.000	30.000	
		Water for curing	KL	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
15.12	E	RCC Grade M40 RCC Grade M40 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.12)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
15.13	1600	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		Unit = MT					
		Taking output = 8 MT					
		a) Material					
		MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	5.333	5.333	5.333	
		Bending Machine	hour	5.333	5.333	5.333	
		Electric generator 15 KVA	hour	5.333	5.333	5.333	
		Tipper					
		Tipper for Transportation					
		(i) 14 cum capacity	t.km	8 x L			
		(ii) 14 cum capacity	t.km		8 x L		
		(iii) 10 cum capacity	t.km			8 x L	
		Loading & Unloading Time	hour				
		(i) 14 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity Light weight Crane	hour			1.778	
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
15.14	2706 & 2200	Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V: 20H towards drawingface . Complete as per drawing and Technical Specifications					
		Unit = Nos.					
		Taking output = 30 Nos.					
		a) Material					
		AC pipe 100 mm dia. (including wastage @ 5 Percent)	metre	31.500	31.500	31.500	
		Average length of weep hole is taken as one metre for the purpose of estimating.					
		MS clamp	Each	30.000	30.000	30.000	
		collar for AC pipe (average) taking 10% of above pipe rate	Each	10.000	10.000	10.000	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.050	0.050	0.050	
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.333	0.333	0.333	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 30 m = a+b+c+d					
		Rate per m (a+b+c+d)/30					
Note		1. In case of stone masonry, the size of the weep hole shall be 150 mm x 80 mm or circular with 150 mm diameter.					
		2. For structure in stone masonry, the weep holes shall be deemed to be included in the item of stone masonry work and shall not be paid separately.					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.15	2700	<p>PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification</p> <p>Unit = cum</p> <p>Taking output = 1 cum</p> <p>a) Material</p> <p>Case I PCC Grade M15 using batching plant & Concrete pump</p> <p>a) Material</p> <p>Concrete, Item No - 15.11 (A), Case-I excluding formworks</p> <p>Concrete, Item No - 15.11 (A), Case-I excluding formworks</p> <p>Concrete, Item No - 15.11 (A), Case-I excluding formworks</p> <p>b) Overhead charges</p> <p>c) Contractor's profit</p> <p>Cost for 1 Cum = a+b+c</p> <p>Rate per Cum (a+b+c)</p> <p>b) Material</p> <p>Case II PCC Grade M15 using batching plant & manual placing</p> <p>Concrete, Item No - 15.11 (A), Case-II excluding formworks</p> <p>Concrete, Item No - 15.11 (A), Case-II excluding formworks</p> <p>Concrete, Item No - 15.11 (A), Case-II excluding formworks</p> <p>b) Overhead charges</p> <p>c) Contractor's profit</p> <p>Cost for 1 Cum = a+b+c</p> <p>Rate per Cum (a+b+c)</p>	cum	1.000			
					1.000		
						1.000	
				@ on (a)	@ on (a)	@ on (a)	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Cement concrete M30	cum	1.000	1.000	1.000	
		Grade Refer relevant item of concrete in item 9.15 (B) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c) (Excluding OH & CP)					
		Added at the rate of 2 Percent of cost					
		HYSD bar reinforcement	tonne	0.050	0.050	0.050	
		Rate as per item No 9.16 (Excluding OH & CP)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum (a+b+c)					

Note The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.

15.17 2705

Drainage Spouts complete as per drawing and Technical specification

Unit = 1 No.

Taking output = 1 No.

a) Material

Corrosion resistant Structural steel including 5 Percent wastage	Kg	4.000	4.000	4.000
GI pipe 100mm dia	metre	0.320	0.320	0.320
GI bolt 10 mm Dia	each	6.000	6.000	6.000
Galvanised MS flat clamp	each	2.000	2.000	2.000

b) Labour

For fabrication

Mate	day	0.002	0.002	0.002
Skilled (Blacksmith, welder etc.)	day	0.027	0.027	0.027
Mazdoor	day	0.027	0.027	0.027

For fixing in position

Mate	day	0.011	0.011	0.011
Mason	day	0.013	0.013	0.013
Mazdoor	day	0.266	0.266	0.266

Add @ 5 Percent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Rate per metre (a+b+c+d)

- Note**
1. In case of viaducts in urban areas, the drainage spouts should be connected with suitably located pipelines to discharge the surface run-off to drains provided at ground level.
 2. In case of bridges, sufficient length of G.I Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.

15.18 2702

Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications

Unit = 1 cum

Taking output = 1 cum

a) Material

Cement concrete M30	cum	1.000	1.000	1.000
Grade Refer relevant item of concrete in Item 15.12 (C) excluding formwork				
HYSD bar reinforcement	tonne	0.075	0.075	0.075
Rate as per item No 15.13 (Excluding OH & CP)				

b) Labour

Mazdoor for cleaning deck slab concrete surface.	day	0.200	0.200	0.200
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c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Rate per cum (a+b+c+d)

15.19 516 & 2702

Mastic Asphalt

Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in Table 500-39, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 516.					
		Unit = sqm					
		Taking output = 72.46 sqm					
		(2 tonnes)(0.869 cum)					
		assuming a density of 2.3 tonnes/cum.					
		a) Labour					
		Mate	day	0.599	0.599	0.599	
		Mazdoor	day	14.630	14.630	14.630	
		Mazdoor (Skilled)	day	0.333	0.333	0.333	
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	0.060	0.060	0.060	
		Air compressor 250 cfm	hour	0.060	0.060	0.060	
		Mastic cooker 1 tonne capacity	hour	6.000	6.000	6.000	
		Bitumen boiler 1500 litres capacity	hour	6.000	6.000	6.000	
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	1.000	1.000	
		c) Material					
		Base mastic (without coarse aggregates) = 60 Percent					
		Coarse aggregate (3.35mm to 9.5 mm size) = 40 Percent .					
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRRI for a specific case)					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		i) Bitumen 80/100 or 60/70 or 30/40 @ 10.2 Percent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	0.204	0.204	
		ii) Crusher stone dust @ 31.9 Percent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.390	0.390	0.390	
		iii) Lime stone dust filler with calcium carbonate content not less than 80 Percent by weight @ 17.92 Percent by weight of mix = $2 \times 17.92/100 = 0.36$	tonne	0.360	0.360	0.360	
		iv) Coarse aggregates 9.5 mm to 3.35 mm size @ 40 Percent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.550	0.550	0.550	
		v) Pre-coated stone chips of 9.5 mm nominal size for skid resistance = $72.46 \times 0.005/10 = 0.036$	cum	0.036	0.036	0.036	
		vi) Bitumen for coating of chips @ 2 Percent by weight = $0.036 \times 1.456 \times 2/100 = 0.001048$ MT = 1.05kg	kg	1.050	1.050	1.050	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 72.46 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/72.46					

Note

1. The rates for 6 mm or any other thickness may be worked out on pro-rata basis.
2. Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.
3. The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

4. This rate analysis is based on design made by CRRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.
5. The quantity of bitumen works out 17 Percent of the mastic asphalt blocks without aggregates and falls within the standards laid down by MoRTH Specifications.

15.20 800

Crash Barriers for Bridge

The rate analysis for semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.

The rate analysis for rigid crash barrier in reinforced cement concrete, have been made and included in chapter-14 on Super-Structure.

15.21 800

Painting on concrete surface

Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 sqm.

Unit = sqm

Taking output = 10 sqm

a) Labour

Mate	day	0.027	0.027	0.027
Painter	day	0.333	0.333	0.333
Mazdoor (Skilled)	day	0.333	0.333	0.333

b) Material

Water based paint of approved quality for cement concrete surface	Litres	5.000	5.000	5.000
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c) Overhead charges

@ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 10 sqm (a+b+c+d)

Rate per sqm (a+b+c+d)/10

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.22	2605	Filler joint					
		(i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Cutting, bending, carrying & fixing etc.					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	0.665	0.665	0.665	
		Mazdoor (Skilled)	day	0.665	0.665	0.665	
		b) Material					
		Copper plate - 12m long x 250 mm wide	kg	55.000	55.000	55.000	
		Area = 12 x 0.25 = 3 sqm					
		Weight = 3 x 0.002 x 8900 = 53.4 kg					
		Wastage @ 2.5 Percent = 1.33 kg/54.73 kg say = 55 kg.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
15.22		(ii) Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		For carrying, placing & fixing.					
		Mate	day	0.011	0.011	0.011	
		Mazdoor	day	0.133	0.133	0.133	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
		b) Material					
		20 mm thick compressible fibre board 12 m long x 25 cm deep.	sqm	3.000	3.000	3.000	
		Area = 12 x 0.25 = 3 sqm					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
15.22	(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications. Unit = Running meter Taking output = 12 m					
		a) Labour					
		Mate	day	0.016	0.016	0.016	
		Mazdoor	day	0.266	0.266	0.266	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
		b) Material					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.600	3.600	3.600	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
15.22	(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 Percent bitumen by weight Unit = Running meter Taking output = 12 m 12m long x 100 mm wide x 10mm deep recess					
		a) Labour					
		Mate	day	0.032	0.032	0.032	
		Mazdoor	day	0.665	0.665	0.665	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
		b) Material					
		Sand	cum	0.012	0.012	0.012	
		Volume 12 x 0.1 x 0.01 = 0.012 cum					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Weight 0.012 x 1400 =
16.8kg

Bitumen cum 0.001 0.001 0.001

16.8 x 0.06 = 1 kg

c) **Overhead charges** @ on (a+b) @ on (a+b) @ on (a+b)
d) **Contractor's profit** @ on @ on (a+b+c) @ on
(a+b+c) (a+b+c)

Cost for 12 m = (a+b+c+d)

Rate per m = (a+b+c+d)/12

Note For arriving at the final rate of filler joints per m length and per cm depth of joint filling compound, the rates at Sl. No. i), ii), iii) & iv) shall be added.

**15.23 710.1.4.
of IRC:78
& 2200**

**Back filling behind abutment,
wing wall and return wall
complete as per drawing and
Technical Specification**

Unit = cum

Taking output = 10 cum

A Granular material

a) Labour

Mate day 0.372 0.372 0.372

Mazdoor day 9.310 9.310 9.310

b) Material

Granular material cum 12.000 12.000 12.000

c) Machinery

Plate compactor/power rammer hour 2.500 2.500 2.500

Water Tanker 6 Kl capacity hour 0.050 0.050 0.050

d) **Overhead charges** @ on @ on (a+b+c) @ on
(a+b+c) (a+b+c)

e) **Contractor's profit** @ on @ on @ on
(a+b+c+d) (a+b+c+d) (a+b+c+d)

Cost for 10 cum of granular backfill =
a+b+c+d+e

Rate per cum = (a+b+c+d+e)/10

15.23

B Sandy material

a) Labour

Mate day 0.372 0.372 0.372

Mazdoor for filling,
watering, ramming etc. day 9.310 9.310 9.310

b) Material

Sand cum 12.000 12.000 12.000

c) Machinery

Plate compactor/power rammer hour 2.500 2.500 2.500

Water Tanker 6 Kl capacity hour 0.060 0.060 0.060

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum of sandy backfill = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					
15.24	710.1.4. of IRC:78 and 2504.2	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification. Unit = cum Taking output = 10 cum.					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.000	12.000	12.000	
		c) Machinery					
		Water Tanker of 6 KL capacity	hour	0.060	0.060	0.060	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		cost for 10 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					
15.25		Painting with synthetic enamel paint bridge No. and span arrangements Painting two coats after filling the surface with synthetic					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		enamel paint bridge No. and span arrangements as per as directed by Engineer. Unit = Nos. Taking output = 1 Nos.					
		a) Labour					
		Mate	day	0.008	0.008	0.008	
		Painter	day	0.133	0.133	0.133	
		Mazdoor	day	0.067	0.067	0.067	
		b) Material					
		Paint conforming to requirement of clause 803.3.	Litre	0.300	0.300	0.300	
		Add for scaffolding @ 1 Percent of labour cost where required					
		Add @ 5 Percent cost of labour and materials to prepare the surface by filling minuts roughness on the surface and priming the surface before laying 2 coats of painting.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 1 No. = a+b+c+d					
		Rate per Nos. = (a+b+c+d)					

CHAPTER – 16

RIVER TRAINING AND PROTECTION WORKS

PREAMBLES:

- 1 Three types of aprons on riverbed as under have been catered.
 - a) Boulder apron laid dry
 - b) Boulder apron laid in wire crates
 - c) Apron laid in cement concrete blocks on M 15
- 2 A toe wall for toe protection of pitching can be either in dry rubble masonry (uncoursed) or in nominal mix cement concrete M 15. Depending upon the design, the rates may be adopted under respective clauses.
- 3 Flooring has been proposed in dry rubble stone, rubble stone laid in Cement Mortar 1:3 and with cement concrete blocks M 15.
- 4 Curtain walls proposed are of the following two types:
 - a) Course rubble stone masonry (1st sort) in Cement Mortar 1:3.
 - b) Cement concrete M 15 grade.
- 5 The rate analysis for gabion structures comprising of stone boulders laid in wire crates have been included. Such structures are suited as retaining structures and for erosion in river training works especially for situations where some settlement of foundation is anticipated. These structures can adjust in minor settlements, being flexible structures, without losing their functional requirement.

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																														
				Large	Medium	Small																															
16.01	2503	<p>Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.</p> <p>A Boulder Laid Dry Without Wire Crates.</p> <p>Unit = cum</p> <p>Taking output = 1 cum</p> <p>a) Material</p> <table><tr><td>Stone</td><td>cum</td><td>1.000</td><td>1.000</td><td>1.000</td></tr><tr><td>Stone Spalls</td><td>cum</td><td>0.200</td><td>0.200</td><td>0.200</td></tr></table> <p>b) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.059</td><td>0.059</td><td>0.059</td></tr><tr><td>Mason</td><td>day</td><td>0.466</td><td>0.466</td><td>0.466</td></tr><tr><td>Mazdoor *</td><td>day</td><td>0.998</td><td>0.998</td><td>0.998</td></tr></table> <p>c) Overhead charges</p> <table><tr><td>@ on (a+b)</td><td>@ on (a+b)</td><td>@ on (a+b)</td></tr></table> <p>d) Contractor's profit</p> <table><tr><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td></tr></table> <p>Rate per cum = (a+b+c+d)</p> <p>* Including excavation for trimming for preparation of bed.</p> <p>Note Nominal excavation required for preparation of bed has been taken into account while making provision for labour.</p>	Stone	cum	1.000	1.000	1.000	Stone Spalls	cum	0.200	0.200	0.200	Mate	day	0.059	0.059	0.059	Mason	day	0.466	0.466	0.466	Mazdoor *	day	0.998	0.998	0.998	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)				
Stone	cum	1.000	1.000	1.000																																	
Stone Spalls	cum	0.200	0.200	0.200																																	
Mate	day	0.059	0.059	0.059																																	
Mason	day	0.466	0.466	0.466																																	
Mazdoor *	day	0.998	0.998	0.998																																	
@ on (a+b)	@ on (a+b)	@ on (a+b)																																			
@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																			
16.02	2503	<p>Boulder Apron Laid in Wire Crates</p> <p>Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100 mm x 100 mm mesh (weaved diagonally) including 10 Percent extra for laps and joints laid with stone boulders weighing not less than 40 kg each.</p> <p>Unit = cum</p> <p>Taking output = 3 mx1.5mx1.25m = 5.63 cum</p> <p>a) Material</p> <table><tr><td>4mm GI wire crates woven in mesh size of 100 mm x 100 mm.</td><td>sqm</td><td>22.000</td><td>22.000</td><td>22.000</td></tr><tr><td>Stone</td><td>cum</td><td>5.630</td><td>5.630</td><td>5.630</td></tr><tr><td>Stone Spalls</td><td>cum</td><td>1.130</td><td>1.130</td><td>1.130</td></tr></table> <p>b) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.239</td><td>0.239</td><td>0.239</td></tr><tr><td>Mazdoor (Skilled)</td><td>day</td><td>1.995</td><td>1.995</td><td>1.995</td></tr><tr><td>Mazdoor*</td><td>day</td><td>3.990</td><td>3.990</td><td>3.990</td></tr></table>	4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.000	22.000	22.000	Stone	cum	5.630	5.630	5.630	Stone Spalls	cum	1.130	1.130	1.130	Mate	day	0.239	0.239	0.239	Mazdoor (Skilled)	day	1.995	1.995	1.995	Mazdoor*	day	3.990	3.990	3.990					
4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.000	22.000	22.000																																	
Stone	cum	5.630	5.630	5.630																																	
Stone Spalls	cum	1.130	1.130	1.130																																	
Mate	day	0.239	0.239	0.239																																	
Mazdoor (Skilled)	day	1.995	1.995	1.995																																	
Mazdoor*	day	3.990	3.990	3.990																																	

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5.63 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/5.63					
		* Mazdoor Including excavation for trimming for preparation of bed.					
		Note Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 Percent of the cost of GI wire may be added for weaving the wire crates.					
16.03	2503	Cement Concrete Blocks (size 0.5 x 0.5 x 0.5 m) Providing and laying of apron with cement concrete blocks of size 0.5 x 0.5 x 0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete with minimum cement content of 250 kg/cum. Unit = cum Taking out put = 1 cum Concrete Grade M15 cum 1.000 1.000 1.000 (Rate taken from items 12.08 A, Case II) including OH & CP Add 2 Percent of cost to account for excavation for preparation of bed, nominal surface reinforcement and filling of granular material in recesses between blocks. Rate per cum					
16.04	2504	Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications A Stone/Boulder Unit = cum Taking output = 1 cum a) Material Stone weighing not less than 40kg cum 1.000 1.000 1.000					

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Stone spalls of minimum 25 mm size	cum	0.200	0.200	0.200	
		b) Labour					
		Mate	day	0.059	0.059	0.059	
		Mason	day	0.466	0.466	0.466	
		Mazdoor	day	0.998	0.998	0.998	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum = (a+b+c+d)					
16.04	B	Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15					
		Unit = cum					
		Taking output = 1 cum					
		Concrete Grade M15	cum	1.000	1.000	1.000	
		(Rate taken from items 12.08 A, Case II) including OH & CP					
		Add 2 Percent of cost to account for nominal surface reinforcement and filling of granular material in recesses between blocks.					
		Rate per cum					
16.05	2504	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Graded stone aggregate of required size	cum	1.200	1.200	1.200	
		b) Labour					
		Mate	day	0.067	0.067	0.067	
		Mazdoor (Skilled)	day	0.333	0.333	0.333	
		Mazdoor *	day	1.330	1.330	1.330	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum = (a+b+c+d)					
		Note:- Includes Mazdoor required for trimming of slope to proper profile and preparation of bed.					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
16.06	700 & 2504	Geotextile Filter Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching. Unit = sqm Taking output = 10 sqm.					
		a) Labour					
		Mate	day	0.021	0.021	0.021	
		Mazdoor	day	0.399	0.399	0.399	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
		b) Material					
		Permeable synthetic geotextile including 5 Percent for overlap and wastage	sqm	11.000	11.000	11.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
16.07	2504.4	Toe protection A toe wall for toe protection can either be in dry rubble masonry in case of dry rubble pitching or pitching with stones in wire crates or it can be in PCC M15 nominal mix if cement concrete block have been used for pitching. Rates for toe wall can be adopted from respective clauses depending upon approved design. The rate for excavation for foundation, dry rubble masonry and PCC M15 have been analysed and given in respective chapters.					
16.08	2505	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concrete bedding. A Rubble stone laid in cement mortar 1:3					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Unit = cum

Taking output = 1 cum

a) Cement mortar 1:3	cum	0.133	0.133	0.133
(Rate taken from items 21.01 A)				
b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.08 (A) including OH & CP .	cum	0.333	0.333	0.333
Quantity shall be adopted as per design (Assume Rubble stone Flooring thickness 300mm and cement concrete bedding thickness 100mm)				
Add 1 Percent of cost to account for excavation for preparation of bed.				
c) Material				
Stone	cum	1.000	1.000	1.000
Stone Spalls	cum	0.200	0.200	0.200
d) Labour				
Mate	day	0.106	0.106	0.106
Mason	day	0.665	0.665	0.665
Mazdoor (for laying stones, filling of quarry spalls)	day	1.995	1.995	1.995
e) Overhead charges		@ on (a+c+d)	@ on (a+c+d)	@ on (a+c+d)
f) Contractor's profit		@ on (a+b+d+e)	@ on (a+b+d+e)	@ on (a+b+d+e)

Rate per cum = (a+b+c+d+e+f)

Note:- *Includes cement mortar for laying and filling of joints.

16.08	B	Cement Concrete blocks Grade M15 including 100 mm thick bedding				
		Concrete Grade M15 block. (Rate taken from items 12.08 A) including OH & CP	cum	1.000	1.000	1.000
		Add for cement concrete bedding (M15 Nominal mix) vide Item 12.08 (A) including OH & CP. Quantity shall be adopted as per design (Assume Cement Concrete blocks thickness 300mm and cement concrete bedding thickness 100mm)	cum	0.330	0.330	0.330
		Add 1 Percent of cost to account for excavation for preparation of bed.				
		Rate per cum				

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
16.09	2506	Dry Rubble Flooring Construction of dry rubble flooring at cross drainage works for relatively less important works. Unit = cum Taking output = 1 cum a) Material Stone cum 1.000 1.000 1.000 Stone Spalls cum 0.200 0.200 0.200 b) Labour Mate day 0.106 0.106 0.106 Mason day 0.665 0.665 0.665 mazdoor day 1.995 1.995 1.995 Add 1 Percent of (b) for trimming and preparation of base. c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Rate per cum = (a+b+c+d)					
16.10	2507.2	Curtain wall complete as per drawing and Technical specification A Stone masonry in cement mortar (1:3) Coursed rubble masonry (1st sort) (Rate taken from items 12.07 A) including OH & CP Rate same as per item No. 12.07 (A) including OH & CP Rate per cum or					
16.10		B Cement concrete Grade M15 Concrete Grade M15 cum 1.000 1.000 1.000 (Rate taken from items 12.08 A) including OH & CP Rate per cum					
		Note Other items like excavation for foundation, filling behind wall, filter media, weep holes etc. shall be added separately as per approved design.					
16.11	2507.2	Flexible Apron : Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall. Unit = cum Taking Output = 1 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Stone	cum	1.000	1.000	1.000	
		Stone Spalls	cum	0.200	0.200	0.200	
		b) Labour					
		Mate	day	0.067	0.067	0.067	
		Mason	day	0.333	0.333	0.333	
		Mazdoor	day	1.330	1.330	1.330	
		Add 1 Percent of cost of (a+b) for trimming and preparation of bed.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum = (a+b+c+d)					
16.12	2503.3	Gabion Structure for Retaining Earth Providing and construction of a gabion structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire Unit = cum Taking output = 7 x 3 x 0.6 = 12.60 cum					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	6.650	6.650	6.650	
		Mazdoor (Skilled)	day	2.660	2.660	2.660	
		b) Material					
		Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size.	sqm	61.000	61.000	61.000	
		Stone boulders with least dimension of 200 mm	cum	12.600	12.600	12.600	
		Stone spalls of minimum size 25 mm	cum	2.520	2.520	2.520	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
d) Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)

Cost for 12.60 cum (a+b+c+d)

Rate per cum (a+b+c+d)/12.60

Note Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 Percent of the cost of GI wire may be added for weaving the wire crates.

16.13 2503.3

Gabion Structure for Erosion Control, River Training Works and Protection works

Providing and constructing gabion structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire.

Unit = cum

Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum

a) Labour

Mate	day	0.186	0.186	0.186
Mazdoor	day	3.325	3.325	3.325
Mazdoor (Skilled)	day	1.330	1.330	1.330

b) Material

Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size to cover 6.00 cum.	sqm	65.000	65.000	65.000
Stone boulders with least dimension of 200 mm	cum	6.000	6.000	6.000
Stone spalls of minimum size 25 mm	cum	1.200	1.200	1.200

c) Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)
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CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
16.15		Embankment Erosion Protection using Fine Aggregate Concrete Filled Fabric Form Mattress system Laying of a fine aggregate concrete grade M30 filled fabric form for erosion protection of embankments Unit = Sqm Taking output = 60 Sqm					
		a) Labour					
		Mate	day	0.128	0.128	0.128	
		Mazdoor	day	2.394	2.394	2.394	
		Mazdoor (skilled)	day	0.798	0.798	0.798	
		b) Machinery					
		Transit truck agitator					
		For Transportation Transit truck agitator 6 cum capacity	t.km	13.800 x L	13.800 x L	13.800 x L	
		Unloading time	hour	0.145	0.145	0.145	
		Concrete Pump	hour	0.145	0.145	0.145	
		c) Materials					
		PCC M30 Grade Refer relevant item of concrete in Item 12.08 (F) Case I by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c)	cum	6.000	6.000	6.000	
		Fabric Form mattress with 30% shrinkage	sqm	78.000	78.000	78.000	
		Non-Woven Geotextile to be placed under concrete filled fabric form including 15 Percent for overlap and shrinkage	sqm	9.000	9.000	9.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 60 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/60					

CHAPTER – 17

REPAIR AND REHABILITATION

PREAMBLES:

- 1 Removal of cement concrete wearing coat and asphaltic wearing coat has been proposed with pneumatic breakers.
- 2 The rate for external pre-stressing has been analysed for three different spans of 25,50 and 100 m.
- 3 Sealing of cranks has been proposed with cement grout, cement mortar (1:1) grout and epoxy grout by injecting with grout pump through nipples.
- 4 Bonding of new concrete with old concrete is proposed with epoxy resin.
- 5 The repair and placement of the following structures has been included:
 - a) Bridge bearings
 - b) Expansion Joints
 - c) Concrete Railing
 - d) Mild steel railing
 - e) Crash barrier

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.01	2811	<p>Removal of existing cement concrete wearing coat including its disposal complete as per Technical Specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000 m</p> <p>Unit = Sqm (Thickness 75 mm)</p> <p>Taking output = 10 sqm</p> <p>a) Labour</p> <p>Mate day 0.053 0.053 0.053</p> <p>Mazdoor day 1.330 1.330 1.330</p> <p>b) Machinery</p> <p>Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories. hour 1.000 1.000 1.000</p> <p>Tractor-trolley. hour 0.500 0.500 0.500</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 10 sqm = (a+d+c+d)</p> <p>Rate per sqm = (a+b+c+d)/10</p>					
17.02	2811	<p>Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.</p> <p>Unit = Sqm</p> <p>Taking output = 10 sqm</p> <p>a) Labour</p> <p>Mate day 0.040 0.040 0.040</p> <p>Mazdoor day 0.998 0.998 0.998</p> <p>b) Machinery</p> <p>Air Compressor 250 cfm with pneumatic breaker. hour 0.750 0.750 0.750</p> <p>Tractor-trolley. hour 0.400 0.400 0.400</p> <p>c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)</p> <p>d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>Cost for 10 sqm = (a+d+c+d)</p> <p>Rate per sqm = (a+b+c+d)/10</p>					
17.03	2807	<p>Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification</p> <p>Unit = Sqm</p> <p>Taking output = 1 sqm</p>					

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Assuming thickness 25 mm					
		a) Material					
		Cement	kg	16.000	16.000	16.000	
		Graded sand	cum	0.040	0.040	0.040	
		Wire mesh 50mm x 50mm size of 3mm wire	kg	2.000	2.000	2.000	
		Epoxy	kg	0.670	0.670	0.670	
		Accelerator compound for guniting @ 4 Percent of weight of cement	kg	0.640	0.640	0.640	
		Add 2 Percent of cost of material for miscellaneous consumables like nozzles, wire brush, cotton waste etc.					
		b) Labour					
		Mate	day	0.010	0.010	0.010	
		Mason	day	0.053	0.053	0.053	
		Mazdoor	day	0.186	0.186	0.186	
		c) Machinery					
		Compressor with guniting equipment along with accessories	hour	0.100	0.100	0.100	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per sqm = (a+b+c+d+e)					
17.04	2800	Providing and inserting nipples with approved fixing compound after drilling holes for grouting as per Technical Specifications including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy Unit = Number Taking output = 1 No.					
		a) Material					
		Nipples	each	1.000	1.000	1.000	
		Cement, fixing compound and consumables @ 15 Percent of cost of nipple					
		b) Labour					
		Mate	day	0.009	0.009	0.009	
		Mazdoor (Skilled) labour for drilling	day	0.106	0.106	0.106	
		Mazdoor (Skilled) labour for fixing nipple and sealing inlets	day	0.106	0.106	0.106	
		Mazdoor for cutting and removing of nipples	day	0.053	0.053	0.053	
		Add 10 Percent of labour cost for drilling holes etc					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per No. = (a+b+c+d)					
17.05	2806	Sealing of cracks/porous concrete by injection process through nipples/ Grouting complete as per Technical Specification.					
	A	Cement Grout Unit = kg Taking output = 1 kg					
		a) Material					
		Cement including 10 Percent wastage	kg	1.100	1.100	1.100	
		Admixtures (anti shrinkage compound) @ 20 Percent of cost of cement					
		b) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		Mazdoor	day	1.330	1.330	1.330	
		c) Machinery					
		Grout pump with agitator and accessories	hour	0.100	0.100	0.100	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per kg = (a+b+c+d+e)					
	B	Cement Mortar (1:1) Grouting Unit = kg Taking output = 1 kg					
		a) Material					
		Cement including 10 Percent wastage	kg	0.550	0.550	0.550	
		Sand including 10 Percent wastage	kg	0.550	0.550	0.550	
		Admixtures (anti shrinkage compound) @ 20 Percent of cost of cement					
		b) Labour					
		Mate	day	0.059	0.059	0.059	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		Mazdoor	day	0.133	0.133	0.133	
		c) Machinery					
		Grout pump with agitator and accessories	hour	0.100	0.100	0.100	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per kg = (a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.06	2800	<p>Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.</p> <p>Unit = sqm</p> <p>Taking output = 10 sqm for an average thickness of 25mm.</p> <p>a) Labour</p> <p>Mate day 0.080 0.080 0.080</p> <p>Mazdoor (Skilled) day 0.998 0.998 0.998</p> <p>Mazdoor day 0.998 0.998 0.998</p> <p>b) Material</p> <p>Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter including 5 Percent wastage. kg 315.000 315.000 315.000</p> <p>c) Machinery</p> <p>Grout pump with agitator and accessories hour 2.000 2.000 2.000</p> <p>d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)</p> <p>Cost for 10 sqm = a+b+c+d+e</p> <p>Rate per sqm = (a+b+c+d+e)/10</p>					
		Note	This item is a proprietary item available in market as pre-packed polymer concrete and is required to be applied as per instructions of the manufacturer.				
17.07	2803	<p>Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.</p> <p>Unit = kg</p> <p>Taking output = 1 kg</p> <p>a) Material</p> <p>Epoxy including 10 Percent wastage kg 1.100 1.100 1.100</p> <p>b) Labour</p> <p>Mate day 0.011 0.011 0.011</p> <p>Mazdoor (Skilled) day 0.133 0.133 0.133</p> <p>Mazdoor day 0.133 0.133 0.133</p> <p>c) Machinery</p> <p>Epoxy Injection gun hour 0.100 0.100 0.100</p> <p>d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)</p> <p>Rate per kg = (a+b+c+d+e)</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.08	2804	<p>Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification</p> <p>Unit = sqm</p> <p>Taking output = 10 sqm</p> <p>Assume average 10mm thickness of epoxy mortar</p> <p>a) Material</p> <p>Epoxy resin-hardener mix for prime coat</p> <p>Epoxy mortar</p> <p>Epoxy resin -hardener mix for seal coat.</p> <p>Add 3 Percent cost of material for other consumables like acetone etc and to cover wastage.</p> <p>b) Labour</p> <p>Mate</p> <p>Mazdoor (Skilled)</p> <p>Mazdoor</p> <p>c) Overhead charges</p> <p>d) Contractor's profit</p> <p>Cost for 10 sqm = a+b+c+d</p> <p>Rate per sqm = (a+b+c+d)/10</p>					
			kg	2.500	2.500	2.500	
			kg	2.200	2.200	2.200	
			kg	2.000	2.000	2.000	
			day	0.053	0.053	0.053	
			day	0.665	0.665	0.665	
			day	0.665	0.665	0.665	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
17.09	2807	<p>Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.</p> <p>unit: sqm</p> <p>Taking output = 10 sqm</p> <p>40 mm average thickness.</p> <p>a) Labour</p> <p>Mate</p> <p>Mazdoor</p> <p>Mazdoor (Skilled)</p> <p>b) Machinery</p> <p>Air compressor 250 cfm</p> <p>Shotcreteing equipment</p>					
			day	0.053	0.053	0.053	
			day	0.665	0.665	0.665	
			day	0.665	0.665	0.665	
			hour	1.000	1.000	1.000	
			hour	1.000	1.000	1.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		water tanker 6 KL capacity	hour	0.020	0.020	0.020	
		c) Material					
		Cement	kg	120.000	120.000	120.000	
		Sand	cum	0.150	0.150	0.150	
		Coarse aggregate of size 4.75mm	cum	0.150	0.150	0.150	
		Quick setting compound	kg	2.500	2.500	2.500	
		Water	KL	0.100	0.100	0.100	
		d) Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		e) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 10 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/10					
17.10	2800	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete					
		Unit = sqm					
		Taking output = 10 sqm					
		Assumed thickness - 10 mm					
		a) Material					
		Acrylic polymer bonding coat	Litre	1.400	1.400	1.400	
		pre-packed cement based polymer mortar of strength 45 Mpa at 28 days	kg	12.000	12.000	12.000	
		Add 3 Percent of (a) above for wastage.					
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor (Skilled)	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Overhead charges		@ on	@ on	@ on	
				(a+b)	(a+b)	(a+b)	
		d) Contractor's profit		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
17.11	2805	Epoxy bonding of new concrete to old concrete					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Material					
		Epoxy resin with pot life not less than 60-90 minutes and satisfying testing as per clause 2803.9	kg	8.000	8.000	8.000	
		Add 3 Percent of (a) above for wastage.					
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mazdoor (Skilled)	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
17.12	2812	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification Span assumed: 25 m No. of cables: 4 no. No. of anchorages : 8 no. Unit = MT Taking output = 1 MT Assume 12.7mm dia. Strand in 12T13 system. Weight-9.42 kg/m of cable.					
		a) Material					
		HTS strand including 5 Percent wastage and extra length for jacking	tonne	1.050	1.050	1.050	
		HDPE pipes 75mm dia including 5 Percent wastage	metre	112.000	112.000	112.000	
		Cement for grouting	kg	400.000	400.000	400.000	
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.000	8.000	8.000	
		Epoxy	kg	6.000	6.000	6.000	
		MS plates for deviator (where deviator blocks are not provided)	tonne	2.100	2.100	2.100	
		Add 20 Percent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.					
		b) Labour					
		i) For making holes in the structure.					
		Mate	day	0.319	0.319	0.319	
		Mazdoor Semi-skilled)	day	3.990	3.990	3.990	
		Mazdoor	day	3.990	3.990	3.990	
		ii) For making and fixing anchorages for cables and placement of cables.					
		Mate	day	0.585	0.585	0.585	
		Blacksmith	day	3.990	3.990	3.990	
		Mazdoor	day	10.640	10.640	10.640	
		iii) For prestressing					
		Mate/Supervisor	day	0.178	0.178	0.178	
		Fitter	day	0.931	0.931	0.931	
		Mazdoor	day	3.525	3.525	3.525	
		iv) For grouting					
		Mate/Supervisor	day	0.178	0.178	0.178	
		Mason	day	0.931	0.931	0.931	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	3.525	3.525	3.525	
		c) Machinery					
		Stressing jack with pump	hour	4.000	4.000	4.000	
		Grouting pump with agitator	hour	1.350	1.350	1.350	
		d) Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		e) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Rate per MT = (a+b+c+d+e)					
17.13	2812	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification Span assumed: 50 m No. of cables: 4 no. No. of anchorages : 8 no. Unit = MT Taking output = 3.10 MT Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		a) Material					
		HTS strand including 5 Percent wastage and extra length for jacking	tonne	3.100	3.100	3.100	
		HDPE pipes 90mm dia including 5 Percent wastage	metre	224.000	224.000	224.000	
		Cement for grouting	tonne	1.010	1.010	1.010	
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.000	8.000	8.000	
		Epoxy	kg	10.000	10.000	10.000	
		MS plates for deviator (where deviator blocks are not provided)	tonne	7.000	7.000	7.000	
		Add 20 Percent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.					
		b) Labour					
		i) For making holes in the structure.					
		Mate	day	0.080	0.080	0.080	
		Mazdoor Semi-skilled)	day	10.640	10.640	10.640	
		Mazdoor	day	10.640	10.640	10.640	
		ii) For making and fixing anchorages for cables and placement of cables.					
		Mate	day	1.702	1.702	1.702	
		Blacksmith	day	9.310	9.310	9.310	
		Mazdoor	day	33.250	33.250	33.250	
		iii) For prestressing					
		Mate/Supervisor	day	0.266	0.266	0.266	
		Fitter	day	1.330	1.330	1.330	
		Mazdoor	day	5.320	5.320	5.320	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		iv) For grouting					
		Mate/Supervisor	day	0.346	0.346	0.346	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	6.650	6.650	6.650	
		c) Machinery					
		Stressing jack with pump	hour	7.000	7.000	7.000	
		Grouting pump with agitator	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		e) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 3.10 MT = a+b+c+d+e					
		Rate per MT = (a+b+c+d+e)/3.10					
17.14	2812	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification Span assumed: 100 m No. of cables: 6 no. No. of anchorages : 12 no. Unit = MT Taking output = 9.28 MT Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		a) Material					
		HTS strand including 5 Percent wastage and extra length for jacking	tonne	9.280	9.280	9.280	
		HDPE pipes 90 mm dia including 5 Percent wastage	metre	672.000	672.000	672.000	
		Cement for grouting	tonne	3.040	3.040	3.040	
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	12.000	12.000	12.000	
		Epoxy	kg	14.000	14.000	14.000	
		MS plates for deviator (where deviator blocks are not provided)	tonne	20.000	20.000	20.000	
		Add 20 Percent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.					
		b) Labour					
		i) For making holes in the structure.					
		Mate	day	2.288	2.288	2.288	
		Mazdoor Semi-skilled)	day	23.940	23.940	23.940	
		Mazdoor	day	33.250	33.250	33.250	
		ii) For making and fixing anchorages for cables and placement of cables.					
		Mate	day	5.320	5.320	5.320	
		Blacksmith	day	26.600	26.600	26.600	
		Mazdoor	day	106.400	106.400	106.400	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		iii) For prestressing					
		Mate/Supervisor	day	0.399	0.399	0.399	
		Fitter	day	1.995	1.995	1.995	
		Mazdoor	day	7.980	7.980	7.980	
		iv) For grouting					
		Mate/Supervisor	day	1.330	1.330	1.330	
		Mason	day	6.650	6.650	6.650	
		Mazdoor	day	26.600	26.600	26.600	
		c) Machinery					
		Stressing jack with pump	hour	10.000	10.000	10.000	
		Grouting pump with agitator	hour	10.000	10.000	10.000	
		d) Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		e) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost for 9.28 MT = a+b+c+d+e					
		Rate per MT = (a+b+c+d+e)/9.28					
17.15	2810	Replacement of Bearings complete as per Technical Specification					
		Unit = Number					
		Taking output = 3 No.					
		Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30m.					
		a) Labour					
		Mate	day	0.851	0.851	0.851	
		Mazdoor (Skilled)	day	5.320	5.320	5.320	
		Mazdoor	day	15.960	15.960	15.960	
		b) Machinery					
		i) Hire charges for jack of 40 tonne lifting capacity. (Lifting of span)	Day	3.000	3.000	3.000	
		c) Material					
		Wooden packing	cum	0.150	0.150	0.150	
		Cost of bearing. (Replacement of bearing)	each	3.000	3.000	3.000	
		d) Overhead charges		@ on	@ on	@ on	
				(a+b+c)	(a+b+c)	(a+b+c)	
		e) Contractor's profit		@ on	@ on	@ on	
				(a+b+c+d)	(a+b+c+d)	(a+b+c+d)	
		Cost of repair of 3 bearings = a+b+c+d+e					
		Rate of repair per bearing = (a+b+c+d+e)/3					
	Note	The work entails replacement of all the bearings on one side of the span.					
17.16	2811	Rectification of Bearings as per Technical Specifications					
		Unit = Number					
		Taking output = 3 No.					
		Lifting of superstructure span by jacking up from below i.e. by placing the jacks					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

on pier/abutment caps for span length of 30m.

a) Labour

Mate	day	0.851	0.851	0.851
Mazdoor (Skilled)	day	5.320	5.320	5.320
Mazdoor	day	15.960	15.960	15.960

b) Machinery

i) Hire charges for jack of 40 tonne lifting capacity.	each	3.000	3.000	3.000
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c) Material

Cost of parts to be replaced for 3 bearings.	each	3.000	3.000	3.000
Wooden packing	cum	0.150	0.150	0.150

d) Overhead charges

@ on	@ on	@ on
(a+b+c)	(a+b+c)	(a+b+c)

e) Contractor's profit

@ on	@ on	@ on
(a+b+c+d)	(a+b+c+d)	(a+b+c+d)

Cost of repair of 3 bearings = a+b+c+d+e

Rate of repair per bearing = (a+b+c+d+e)/3

Note The rectification of 3 bearings included in this analysis is on the same side of the span.

17.17

Replacement of Expansion Joints complete as per drawings

Unit - RM

Taking output = 12 RM

a) Material

Epoxy for bonding new concrete to old concrete @ 0.8 kg/sqm	kg	9.600	9.600	9.600
M-30 grade cement concrete excluding OH & CP (Rate taken from items 14.01 C (i) (p))	cum	3.600	3.600	3.600

b) Labour

Removal of old expansion joint including breaking of concrete, cutting of lugs and shifting of broken material etc.

Mate	day	0.346	0.346	0.346
Mazdoor	day	7.980	7.980	7.980
Mazdoor (Skilled)	day	0.665	0.665	0.665

c) Overhead charges

@ on	@ on	@ on
(a+b)	(a+b)	(a+b)

d) Contractor's profit

@ on	@ on	@ on
(a+b+c)	(a+b+c)	(a+b+c)

Cost for replacement of 12 RM = a+b+c+d

Rate per RM = (a+b+c+d)/12

Note The rate for the installation of new expansion joints may be taken from the chapter on superstructure. Broken concrete will have to be replaced which has been included in this analysis.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.18		Replacement of Damaged Concrete Railing. Unit = RM Taking output = 10 RM a) Labour Labour for dismantling old railing and disposal of dismantled material. Mate day 0.266 0.266 0.266 Mazdoor day 6.650 6.650 6.650 b) Machinery Tractor-trolley for disposal of dismantled material hour 1.000 1.000 1.000 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 10 m = a+b+c+d Rate per metre = (a+b+c+d)/10					
	Note	The rate for the provision of new railing may be adopted from the chapter on superstructure.					
17.19		Replacement of Crash Barrier. Unit = RM Taking output = 10 M a) Labour Labour for dismantling old railing and disposal of dismantled material. Mate day 0.532 0.532 0.532 Mazdoor day 13.300 13.300 13.300 b) Machinery Tractor-trolley for disposal of dismantled material hour 1.000 1.000 1.000 c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b) d) Contractor's profit @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) Cost for 10 m = a+b+c+d Rate per metre = (a+b+c+d)/10					
	Note	The rate for the construction of new crash barrier may be adopted from chapter 8 on Traffic and Transportation.					
17.20		Replacement of Damaged Mild Steel Railing Unit = RM Taking output = 10 M a) Labour Labour for dismantling old railing and disposal of dismantled material. Mate day 0.213 0.213 0.213 Mazdoor day 5.320 5.320 5.320					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.000	1.000	1.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 m = a+b+c+d					
		Rate per metre = (a+b+c+d)/10					
17.21		Repair of Crash Barrier					
		Repair of concrete crash barrier with cement concrete of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work.					
		Unit = Running meter					
		Taking output = 10 M.					
		It is assumed that damage is to the extent of 10 percent of the volume of concrete. This will require 0.30 cum of concrete.					
		a) Manpower*					
		Mate	day	0.053	0.053	0.053	
		Mazdoor	day	1.330	1.330	1.330	
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		b) Material					
		M-30 grade cement concrete excluding OH & CP (Rate taken from items 14.01 C (i) (p))	cum	0.300	0.300	0.300	
		This may be priced based on the rate given the chapter of superstructure.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 m = a+b+c+d					
		Rate per m = (a+b+c+d)/10					
17.22		Repair of RCC Railing					
		Carrying out repair of RCC M30 railing to bring it to the original shape.					
		Unit = Running meter					
		Taking output = 10 M.					
		It is assumed that damage is to the extent of 10 Percent					
		a) Material					
		M-30 grade cement concrete excluding OH & CP (Rate taken from	cum	0.100	0.100	0.100	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		items 14.01 C (i) (p)					
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.013	0.013	0.013	
		b) Labour*					
		Mate	day	0.011	0.011	0.011	
		mazdoor	day	0.266	0.266	0.266	
	*	For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 m = a+b+c+d					
		Rate per m = (a+b+c+d)/10					
17.23		Repair of Steel Railing					
		Repair of steel railing to bring it to the original shape					
		It is assumed that the damage to the steel railing is to the extent of 10 Percent.					
		Unit = Running meter					
		Taking output = 10 M.					
		a) Material					
		Mild steel ISMC series	kg	29.000	29.000	29.000	
		Flat iron	kg	10.000	10.000	10.000	
		MS Bolt and nuts	kg	1.000	1.000	1.000	
		Add 5 Percent of cost of material for painting.					
		b) Labour					
		Mate	day	0.021	0.021	0.021	
		Mazdoor (Skilled)	day	0.266	0.266	0.266	
		Mazdoor	day	0.266	0.266	0.266	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost of repair for 10 m = a+b+c+d					
		Cost of meter = (a+b+c+d)/10					
17.24		Mobile Bridge Inspection Unit (MBIU)					
		Inspection of bridge by using of Mobile Bridge Inspection Unit (MBIU)					
		Unit = Km					
		Taking output = 50 Km					
		a) Labour					
		Mate	day	1.360	1.360	1.360	
		Mazdoor (skilled)	day	34.000	34.000	34.000	
		Mazdoor	day	34.000	34.000	34.000	
		b) Machinery					
		Mobile Bridge Inspection Unit (MBIU)	hour	266.667	266.667	266.667	
		Mobile Bridge Inspection Unit (MBIU) Mobilization &	hour	15.000	15.000	15.000	

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

demobilization

Add 1 Percent of cost of a+b for

Miscellaneous work

c) Overhead charges	@ on	@ on	@ on
	(a+b)	(a+b)	(a+b)
d) Contractor's profit	@ on	@ on	@ on
	(a+b+c)	(a+b+c)	(a+b+c)

Cost for 50 Km = a+b+c+d

Rate per Km = (a+b+c+d)/ 50

- Note:** (i) Average Distance has been considered 300 km for mobilization at working site and same for demobilization
(ii) Speed of vehicle 40Km/hr. has been considered.

PART – C

TUNNEL WORKS

C. TUNNEL WORKS

BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

The basic approach for the preparation of Standard Data Book for Tunnel Works is indicated as under:

Description of items

The description of items is given briefly and linked with the relevant IRC-91, which may be referred for detailed description, provisions and interpretation.

Overhead Charges

The overhead charges include the following elements:

- i. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Office furniture, equipment and communications
- iii. Expenditure on
 - Corporate office of contractor
 - Site supervision
 - Documentation and "as built" drawings
- iv. Mobilization/de-mobilization of resources
- v. Labour camps with minimum amenities and transportation to work sites
- vi. Light vehicles for site supervision including administrative and managerial requirements
- vii. Laboratory equipment and quality control including field and laboratory testing
- viii. Minor T&P and survey instruments and setting out works, including verification of line, dimensions, trial pits and bore holes, where required
- ix. Temporary Diversion
- x. Watch and ward
- xi. Traffic management during construction
- xii. Expenditure on 'safeguarding environment
- xiii. Sundries
- xiv. Financing Expenditure
- xv. Work Insurance/compensation
- xvi. Car Policy
- xvii. Employee Insurance
- xviii. Property Insurance (Camp Builtup Area)

For the purpose of calculation of overhead charges

Tunnel Work	25 percent
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Contractor Profit :	10 Percent of cost of works
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Contractor profit is also added on overhead charges.

C. TUNNEL WORKS

BASIC APPROACH AND GENERAL CONDITIONS FOR THE PREPARATION OF STANDARD DATA BOOK

Basic Inputs

Basic inputs are only given in the standard data book. The rates for material and labour have to be updated by concerned State/UT govt. Officials like E-in-C, CE(NH), State PWDs.

Plants and Equipment

In the analysis of rates, for any items of work, capacity of. Equipment with corresponding output has been indicated which is most common in use for estimation purpose. Seeing the volume of job, different capacity equipment with corresponding output as indicated in Chapter-20 can be provided for preparing the estimate.

Materials

The rates of material should include basic cost at crushing units, cost of carriage including loading and unloading and stacking of material at site of work and shall be determined through market enquiries.

Labour

Highly Skilled labour include mason (1st class), carpenter, Blacksmith (1st class)/ Welder/ Plumber/ Electrician, (1st class), mechanics and other trades.

One mate has been provided for 25 labours.

Carriage of Materials

The unit for vehicle for carriage has been taken as under:

- a) In hours where lead is defined including time required for loading and unloading
- b) In tonne· km where lead is variable. The loading and unloading for such cases have been provided separately.

General :

Most of tunnels works in India is constructed / under construction using NATM technology and Rate has been analysed using the same. However, analysis of rate for tunnel construction with TBM will be incorporated in future.

Various items for tunnel work i.e. firefighting, ventilation, tunnel lighting, safety items etc. has been included in this Chapter.

The testing of materials and finished items of work is covered under overhead charges.

The Standard Data Book is for Department use only. It cannot be produced in Court of law as references/ authority and this is a privilege document.

CHAPTER – 18

TUNNEL WORK

PREAMBLES:

- 1 For drilling, pneumatically and hydraulically powered method is considered.
- 2 The excavated materials suitable for construction shall be stockpiled at approved locations otherwise it should be dumped at the approved disposal location.
- 3 Cement Grouting has been also considered to prevent the seepage of water from the side wall of the tunnel. The grout mix shall have low or no bleedability and low shrinkage characteristics. Guniting to sides and arch of tunnel with cement mortar 1:3 proportion by weight is also considered for analysis.
- 4 Two types of material for shotcrete i.e. welded wire mesh and fiber reinforced micro silica has been considered.
- 5 Rock bolting, steel support and lining items are considered for analysis.
- 6 Permanent structural steel supports i.e. lattice girder has been also consider for analysis.
- 7 The basic rates are inclusive of scaling loose material, removal of under-cuts, cleaning bed and lighting and ventilation inside tunnel during construction.
- 8 The items related to road works, drain, footpath, crash barrier, railing, kerb etc. of tunnel is covered under relevant Chapters. But overhead charges are applicable for tunnel work.
- 9 The basic rates are exclusive of cost of dewatering. Separate provision shall be made in the estimate for dewatering.
- 10 The rate for lighting, ventilation and firefighting items are required to be ascertained from the market, this being a commercially produced item by specialized firms.

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
18.01	304	Excavation in Ordinary Rock using Hydraulic Excavator and Tippers with Disposal upto 1000 meters. Excavation for Portal in Ordinary Rock with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and disposal of excavated materials including all lifts and lead upto 1000m Unit = cum Taking output = 60 cum a) Labour Mate day 0.053 Mazdoor day 1.330 b) Machinery Excavator 1.1 cum bucket capacity hour 9.778 Jack Hammer hour 9.778 Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader) cum 72.000 Tipper 10 cum capacity for transportation to dumping yard considering lead @ 1km t-km 120.000 c) Overhead charges @ on (a+b) d) Contractor's profit @ on (a+b+c) Cost for 60 cum = a+b+c+d Rate per cum = (a+b+c+d)/60			
18.02	303 & 304	Excavation in Hard Rock (blasting prohibited) Excavation for Portal in Hard Rock (blasting prohibited) with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and and disposal of excavated materials including all lifts and lead upto 1000m Unit = cum Taking output =50 cum a) Labour Mate day 0.053 Mazdoor day 1.330 b) Machinery Excavator 1.1 cum bucket capacity hour 11.951 Jack Hammer hour 11.951 Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader) cum 60.000 Tipper 10 cum capacity for transportation to dumping yard considering lead @ 1km t-km 100.000 Credit for excavated rock found suitable for use @ 50 Percent of excavated quantity cum 30.000 c) Overhead charges @ on (a+b) d) Contractor's profit @ on (a+b+c) Cost for 50 cum = a+b+c+d Rate per cum = (a+b+c+d)/50			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
18.03	303	Excavation in Soil using Hydraulic Excavator and Tippers with Disposal upto 1000 meters. Excavation for portal in soil with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and and disposal of excavated materials including all lifts and lead upto 1000m Unit = cum Taking output =350 cum			
		a) Labour			
		Mate	day	0.053	
		Mazdoor	day	1.330	
		b) Machinery			
		Excavator 1.1 cum bucket capacity	hour	5.981	
		Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	hour	5.981	
		Tipper 10 cum capacity for transportation to dumping yard considering lead @ 1km	t-km	525.000	
		c) Overhead charges @ on (a+b)			
		d) Contractor's profit @ on (a+b+c)			
		Cost for 350 cum = a+b+c+d			
		Rate per cum = (a+b+c+d)/350			
18.04		Drill steel with Drill jumbo Excavation for tunnel by using drilling & blasting methods in all types of rock including cost of all materials, machinery, labour, scaling excavated surface, marking, ventilation, lighting, drainage, removing and hauling the excavated muck outside tunnel upto specified dump area and all other ancillary operations etc. Unit = cum Taking output =480 Cum			
		a) Labour			
		Mate	day	0.426	
		Mazdoor	day	7.980	
		Mazdoor (Skilled)	day	2.660	
		b) Machinery			
		Three boom Hydraulic Drill Jumbo	hour	25.067	
		Excavator for Scaling	hour	2.000	
		Tipper 10 cum capacity for transportation	tonne.km	480 x 2 x L	
		Loading & unloading charges(Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	cum	576.000	
		Dozer (175 HP)	hour	9.600	
		c) Materials			
		Explosives	Kg	576.000	
		Delay Detonators	Nos.	228.000	
		Electric Detonators	Nos.	35.000	
		Detonation fuse coil	Meter	50.000	
		3.7 m long extension rod	Nos	1.043	

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Drifter rod	Nos	0.505	
		R32 shank adapter	Nos	1.043	
		45 mm Button Bit	Nos	3.692	
		Add 10 Percent of cost of a+b+c towards Other consumable petty stores such as blasting batteries, galvanometers and sharpening charges of bit etc.			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 480 cum = a+b+c+d+e			
		Rate per cum = (a+b+c+d+e)/480			
18.05	304	Dewatering tunnel by pumping out water collected by natural drainage inside tunnel including			
		Dewatering in tunnel by pumping out water collected by natural drainage inside tunnel including providing sump wherever necessary, cost of all materials, machinery, labour, drainage and all other ancillary operations etc.complete.			
		Unit = Hour			
		Taking output = 20000 Hour			
		a) Labour			
		Mate	day	133.000	
		Mazdoor	day	3325.000	
		b) Machinery			
		Water Pump 10 HP	hour	20000.000	
		c) Materials			
		GI Pipe 100 mm Dia	Meter	500.000	
		Flange	Kg.	41.667	
		Nut & Bolt	Kg.	133.333	
		Bracket	Kg.	1125.000	
		Credit for salvage value of GI Pipe @ 30 Percent	Meter	150.000	
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 20000 hour = a+b+c+d+e			
		Rate per hour = (a+b+c+d+e)/20000			
18.06		Providing , Fitting and Placing of Ribs			
		Providing, Fitting and Placing of Ribs including Fabrication, Erection, Temporary fixture, Handling of material inside fabrication workshop, final matching, field welding and complete as per Drawing and Technical Specifications.			
		Unit = Tonne			
		Taking output = 26 Tonne			
		a) Labour			
		Mate	day	1.064	
		Mazdoor	day	13.300	
		Mazdoor(Semi Skilled)	day	6.650	
		Welder	day	6.650	
		b) Machinery			
		Rotating Telehandlers	hour	37.180	
		c) Materials			
		ISMB 350 (Including 0.25% Wastage)	Tonne	20.732	

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		MS Channel ISMC 75 (Including 0.25% Wastage)	Tonne	3.830	
		MS Plate 200 x 200 x 12 mm (Including 0.25% Wastage)	Tonne	1.504	
		Nuts and bolts (M 16X40)	Kg	151.200	
		Add 40 Percent of cost of a+b+c towards of Fabrication Erection, Temporary fixture, Handling of material, final matching and field welding etc.			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 26 Tonne = a+b+c+d+e			
		Rate per Tonne = (a+b+c+d+e)/26			
18.07	2807	Shotcreting with Steel fiber reinforced micro silica shotcrete (SFRS)			
		Shotcreting to upper bench / lower bench with steel fiber reinforced shotcrete (SFRS), shotcrete compressive strength shall be 25 N/mm ² and complete as per Drawing and Technical Specifications.			
		Unit = cum			
		Taking output =120 Cum			
		a) Labour			
		Mate	day	0.426	
		Mazdoor	day	10.640	
		b) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	1.429	
		Generator 250 KVA	hour	1.429	
		Loader 3.1 cum capacity	hour	1.429	
		Transit truck agitator			
		For transportation (6 cum Capacity)	tonne.km	300 x L	
		For loading & unloading	hour	11.429	
		Shotcrete Machine @ 12 cum/hour	hour	10.000	
		Compressor 500 cfm	hour	10.000	
		c) Materials			
		Cement	Tonne	49.440	
		Sand	Cum	86.850	
		10 mm to 4.76 mm Aggregate	Cum	52.080	
		Steel Fiber	Tonne	6.120	
		Admixture @ 0.4 % of Cement	Kg	197.760	
		Micro silica @ 6 % of Cement	Kg	2966.400	
		Accelerator @ 4.5 % of Cement	Kg	2224.800	
		Add 20 Percent of cost of a+b+c for Wastage due to rebound.			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 120 Cum = a+b+c+d+e			
		Rate per Cum = (a+b+c+d+e)/120			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)																																																
18.08	2807	<p>Shotcreting with welded wire mesh</p> <p>Shotcreting to upper bench / lower bench with welded wire mesh, shotcrete compressive strength shall be 25 N/mm2 and complete as per Drawing and Technical Specifications.</p> <p>Unit = cum</p> <p>Taking output =120 Cum</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.426</td></tr><tr><td>Mazdoor</td><td>day</td><td>10.640</td></tr></table> <p>b) Machinery</p> <table><tr><td>Batching Plant of capacity 120 cum/hour</td><td>hour</td><td>1.429</td></tr><tr><td>Generator 250 KVA</td><td>hour</td><td>1.429</td></tr><tr><td>Loader 3.1 cum capacity</td><td>hour</td><td>1.429</td></tr></table> <p>Transit truck agitator</p> <table><tr><td>For transportation (6 cum Capacity)</td><td>tonne.km</td><td>300 x L</td></tr><tr><td>For loading & unloading</td><td>hour</td><td>11.429</td></tr><tr><td>Shotcrete Machine @ 12 cum/hour</td><td>hour</td><td>10.000</td></tr><tr><td>Compressor 500 cfm</td><td>hour</td><td>10.000</td></tr></table> <p>c) Materials</p> <table><tr><td>Cement</td><td>Tonne</td><td>49.440</td></tr><tr><td>Sand</td><td>Cum</td><td>86.850</td></tr><tr><td>10 mm to 4.76 mm Aggregate</td><td>Cum</td><td>52.080</td></tr><tr><td>Wire mesh (Including 10% for lapping)</td><td>Sqm</td><td>1320.000</td></tr><tr><td>Admixture @ 0.4 % of Cement</td><td>Kg</td><td>197.760</td></tr><tr><td>Micro silica @ 6 % of Cement</td><td>Kg</td><td>2966.400</td></tr><tr><td>Accelerator @ 4.5 % of Cement</td><td>Kg</td><td>2224.800</td></tr></table> <p>Add 20 Percent of cost of a+b+c for Wastage due to rebound.</p> <p>d) Overhead charges @ on (a+b+c)</p> <p>e) Contractor's profit @ on (a+b+c+d)</p> <p>Cost for 120 Cum = a+b+c+d+e</p> <p>Rate per Cum = (a+b+c+d+e)/120</p>	Mate	day	0.426	Mazdoor	day	10.640	Batching Plant of capacity 120 cum/hour	hour	1.429	Generator 250 KVA	hour	1.429	Loader 3.1 cum capacity	hour	1.429	For transportation (6 cum Capacity)	tonne.km	300 x L	For loading & unloading	hour	11.429	Shotcrete Machine @ 12 cum/hour	hour	10.000	Compressor 500 cfm	hour	10.000	Cement	Tonne	49.440	Sand	Cum	86.850	10 mm to 4.76 mm Aggregate	Cum	52.080	Wire mesh (Including 10% for lapping)	Sqm	1320.000	Admixture @ 0.4 % of Cement	Kg	197.760	Micro silica @ 6 % of Cement	Kg	2966.400	Accelerator @ 4.5 % of Cement	Kg	2224.800			
Mate	day	0.426																																																			
Mazdoor	day	10.640																																																			
Batching Plant of capacity 120 cum/hour	hour	1.429																																																			
Generator 250 KVA	hour	1.429																																																			
Loader 3.1 cum capacity	hour	1.429																																																			
For transportation (6 cum Capacity)	tonne.km	300 x L																																																			
For loading & unloading	hour	11.429																																																			
Shotcrete Machine @ 12 cum/hour	hour	10.000																																																			
Compressor 500 cfm	hour	10.000																																																			
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Accelerator @ 4.5 % of Cement	Kg	2224.800																																																			
18.09	2806 & 3200	<p>Providing and fixing 25 mm diameter 3 meter long steel rock bolts including drilling 45 mm dia holes, plate, nuts, cement grout, cost of all materials, machinery, labour, ventilation, lighting, drainage and all other ancillary operations etc. complete as per Drawing and Technical Specifications.</p> <p>Unit = Number</p> <p>Taking output =155 Nos.</p> <p>a) Labour</p> <table><tr><td>Mate</td><td>day</td><td>0.638</td></tr><tr><td>Mazdoor</td><td>day</td><td>10.640</td></tr><tr><td>Mason (IInd class)</td><td>day</td><td>5.320</td></tr></table> <p>b) Machinery</p> <table><tr><td>Single boom Hydraulic Drill Jumbo</td><td>hour</td><td>25.833</td></tr></table>	Mate	day	0.638	Mazdoor	day	10.640	Mason (IInd class)	day	5.320	Single boom Hydraulic Drill Jumbo	hour	25.833																																							
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Mazdoor	day	10.640																																																			
Mason (IInd class)	day	5.320																																																			
Single boom Hydraulic Drill Jumbo	hour	25.833																																																			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		c) Materials			
		3.7 m long extension rod	Nos	1.011	
		R32 shank adapter	Nos	1.011	
		45 mm dia cross bit	Nos	3.577	
		25 mm Tor Steel (Including 2.5% Wastage)	Tonne	1.927	
		Add 15 Percent of cost of a+b+c towards cutting ,making tip, Threading, nut , plate, grouting and bit sharpening etc..			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 155 Nos = a+b+c+d+e			
		Rate per Number = (a+b+c+d+e)/155			
18.10	2806 & 3200	Providing and fixing 32 mm diameter 7 meter long steel rock bolts including drilling 51 mm dia holes, plate, nuts, cement grout, cost of all materials, machinery, labour, ventilation, lighting, drainage and all other ancillary operations etc. complete as per Drawing and Technical Specifications.			
		Unit = Number			
		Taking output =70 Nos.			
		a) Labour			
		Mate	day	0.798	
		Mazdoor	day	13.300	
		Mason (IInd class)	day	6.650	
		b) Machinery			
		Single Boom Hydraulic	hour	17.500	
		c) Materials			
		3.7 m long extension rod	Nos	1.065	
		R32 shank adapter	Nos	1.065	
		32 mm coupling sleeve	Nos	1.065	
		51 mm dia button bit	Nos	3.769	
		32 mm Tor Steel (Including 2.5% Wastage)	Tonne	3.237	
		Add 15 Percent of cost of a+b+c towards cutting ,making tip, Threading, nut , plate, grouting and bit sharpening etc..			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 70 Nos = a+b+c+d+e			
		Rate per Number = (a+b+c+d+e)/70			
18.11	2806	Grouting with Cement			
		Grouting cement slurry in grout holes under specified pressure for consolidation / contact grouting including cost of all materials, machinery, labour, predrilling wherever necessary, ventilation, lighting, drainage and other ancillary operations etc. complete as per Drawing and Technical Specifications.			
		Unit = Tonne			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Taking output = 1.5 Tonne			
		a) Labour			
		Mate	day	0.106	
		Mazdoor	day	2.660	
		b) Machinery			
		Grouting machine @ 25 Bags Per Hours	hour	1.200	
		Pump 10 HP	hour	1.200	
		Single Boom Hydraulic	hour	1.250	
		c) Materials			
		Cement Including 1% Wastage)	Tonne	1.515	
		Cost of water (Water/Cement Ratio - 0.4)	KL	0.606	
		3.7 m long extension rod	Nos	0.076	
		R32 shank adapter	Nos	0.076	
		32 mm coupling sleeve	Nos	0.076	
		51 mm dia cross bit	Nos	0.269	
		Add 5 Percent of cost of a+b+c towards cutting, making tip, Threading, nut , plate, grouting and bit sharpening etc..			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 1.5 Tonne = a+b+c+d+e			
		Rate per Tonne = (a+b+c+d+e)/1.5			
18.12	1700	Furnishing and Placing Reinforced cement concrete in Tunnel Work as per drawing and Technical Specification			
18.12	1700	A RCC Grade M20			
		Using Batching Plant, Transit Mixer and Concrete Pump			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.05)			
		Water for curing	KL	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		f) Overhead charges @ on (a+b+c+d)			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		g) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	B			
		RCC Grade M25			
		Using Batching Plant, Transit Mixer and Concrete Pump			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.07)			
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump			
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	C			
		RCC Grade M 30			
		Using Batching Plant, Transit Mixer and Concrete Pump.			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.09)			
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	

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Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	D			
		RCC Grade M35			
		Using Batching Plant, Transit Mixer and Concrete Pump			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.11)			
		Water for curing	KL	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne- km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	E			
		RCC Grade M-40			
		Using Batching Plant, Transit Mixer and Concrete Pump			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.12)			
		Water for curing	KL	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	

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Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	F			
		RCC Grade M-45			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.13)			
		Water for curing	KL	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			

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Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
18.12	1700	G			
		RCC Grade M-50			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.14)			
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	H			
		RCC Grade M- 55			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.15)			
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			

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Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		e) Overhead charges @ on (a+b+c+d) f) Contractor's profit @ on (a+b+c+d+e) Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	I			
		RCC Grade M- 60 Unit = Cum Taking output = 120 cum a) Material Per Cum Basic Cost cum 120.000 (Rate taken from sub-analysis -21.16) Water for curing KI 63.000 b) Labour For pouring and placing Mate day 0.317 Mason day 1.995 Mazdoor day 5.922 c) Machinery Transit truck agitator For transportation (6 cum Capacity) , L1- lead in tonne- 300 x L1 Kilometer km For unloading hour 2.905 Hydraulic Boom placer pump hour 2.905 Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading) (i) 12 KL capacity hour 1.167 x L1 + 3.5 d) Formwork and staging 40 percent of (a+b+c) e) Overhead charges @ on (a+b+c+d) f) Contractor's profit @ on (a+b+c+d+e) Cost for 120 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	J			
		RCC Grade M- 65 Unit = Cum Taking output = 120 cum a) Material Per Cum Basic Cost cum 120.000 (Rate taken from sub-analysis -21.17) Water for curing KI 63.000 b) Labour For pouring and placing Mate day 0.317 Mason day 1.995 Mazdoor day 5.922 c) Machinery Transit truck agitator For transportation (6 cum Capacity) , L1 - lead in tonne- 300 x L1 Kilometer km For unloading hour 2.905 Hydraulic Boom placer pump hour 2.905			

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Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading) (i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.13	1600	Supplying, fitting and placing HYSD bar reinforcement in Tunnel Work complete as per drawing and technical specifications			
		Unit = MT			
		Taking output = 8 MT			
		a) Material			
		MS bars including 5 Percent overlaps and wastage	tonne	8.400	
		Binding wire	Kg	48.000	
		b) Labour for straightening, cutting, bending,shifting to site, tying and placing in position			
		Mate	day	0.213	
		Blacksmith	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Cutting Machine	hour	8.000	
		Bending Machine	hour	8.000	
		Electric generator 15 KVA	hour	8.000	
		Tipper			
		Tipper for Transportation			
		(i) 14 cum capacity	t.km	8 x L1	
		Loading & Unloading Time	hour		
		(i) 14 cum capacity	hour	2.000	
		Light weight Crane			
		At cutting bending yard	hour	2.000	
		At site	hour	2.000	
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 8 MT (a+b+c+d+e)			
		Rate for per MT (a+b+c+d+e)/8			

CHAPTER – 19

ENVIRONMENTAL MANAGEMENT & BIO ENGINEERING

PREAMBLE:

1. The items of Bio-Engineering comprising Bamboo crib wall, Fascines, Brush Layers, Palisades in Rills & Slopes, Seeding and Mulching have been included in the chapter to stabilize hill slopes.
2. Seeding and mulching has been included as earth work to stabilize the cut and fill slope in plane
3. To attenuate the environmental pollution generated during construction and operation stage, three type of preventive measures have been provided
 - a) Dust suppression
 - b) Noise Barrier
 - c) Silt fencing

The selection of the attenuation factor will be based on site situation and the sensitive receptors.

4. The analysis of rates for Environmental Monitoring – Air, Water, Noise & Soil has been included to cater with the compliance submission to SPCB & MoEF&CC.
5. The rates for consent approval from SPCB & CPCB for Consent to Establish (CtE) and Consent to Operate (CtO) for setting of Plant has been estimate and considered.
6. The cost of Environment and Social Workshops to create awareness to the locals, NGOs, etc. has been evaluated.
7. The estimates for compensatory afforestation though proposed by the forest authority and those planted in the median by contractor has been analysed and included in rate list.
8. The overhead charges will be applicable of Road Works for this chapter.
9. The cost of maintenance for plantation has been considered and included for the purpose of estimation.

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.01	Suggestive	Noise Barriers					
		(i) Masonry wall					
		Unit = cum					
		Taking output = 5 Cum					
		a) Material					
		Bricks 1st class	each	2500.000	2500.000	2500.000	
		Cement mortar 1:3 (Rate as sub-analysis)	cum	1.200	1.200	1.200	
		Water for curing	KL	2.415	2.415	2.415	
		b) Labour					
		Mate	day	0.586	0.586	0.586	
		Mason	day	4.000	4.000	4.000	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.034 x L1 + 0.101			
		(ii) 12 KL capacity	hour		0.045 x L1 + 0.134		
		(iii) 6 KL capacity	hour			0.089 x L1 + 0.268	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 5 Cum = a+b+c+d+e					
		Rate per Cum = (a+b+c+d+e) /5					
		(ii) Galvanized steel plain sheet					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.073	0.073	0.073	
		blacksmith	day	0.500	0.500	0.500	
		Mazdoor	day	1.330	1.330	1.330	
		b) Material					
		Galvanized steel plain sheet (5 mm) including 5% wastage	Kg	3.150	3.150	3.150	
		MS Angle	Kg	154.500	154.500	154.500	
		Add 10 Percent of cost of a+b towards of drilling , nut & bolt etc.					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/100					
		Note :- Rate for excavation, cement concrete M-25 and painting may be taken from respective chapters					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

(iii) Acrylic noise barrier sheet

Unit = sqm

Taking output = 100 sqm

a) Labour

Mate	day	0.073	0.073	0.073
blacksmith	day	0.500	0.500	0.500
Mazdoor	day	1.330	1.330	1.330

b) Material

Acrylic noise barrier sheet (3 mm) including 5% wastage	Sqm	105.000	105.000	105.000
MS Angle	Kg	154.500	154.500	154.500

Add 10 Percent of cost of a+b towards of drilling , nut & bolt etc..

c) Overhead charges

@ on (a+b) @ on (a+b) @ on (a+b)

d) Contractor's profit

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

Cost for 100 sqm = a+b+c+d

Rate per sqm = (a+b+c+d) /100

Note :- Rate for excavation, cement concrete M-25 and painting may be taken from respective chapters

19.02 Suggestive

Construction of bamboo crib wall complete as per drawing and additional Technical specification.

Unit = Rm

Taking output = 1 Rm

a) Labour

Mate	day	0.021	0.021	0.021
Mazdoor skilled	day	0.133	0.133	0.133
Mazdoor	day	0.399	0.399	0.399

b) Machinery

Water tanker 6 KL capacity	hour	0.008	0.008	0.008
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c) Materials

Bamboos (For Horizontal Beam)	Rm	4.000	4.000	4.000
Live Stake Stump / Bamboos (Vertical)	Rm	1.500	1.500	1.500
Live Stake Stump / Bamboos (Horizontal)	Rm	1.000	1.000	1.000
Binding Material	Rm	2.000	2.000	2.000
Cost of Water	KL	0.050	0.050	0.050
Grass	Kg	1.500	1.500	1.500

d) Overhead charges

@ on (a+b+c) @ on (a+b+c) @ on (a+b+c)

e) Contractor's profit

@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)

Cost for 1 RM = a+b+c+d+e

Rate per Rm = (a+b+c+d+e)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.03	Suggestive	Construction of Fascines with a bundle of sticks complete as per drawing and additional Technical specification. Unit = Rm Taking output = 10 Rm a) Labour Mate day 0.133 0.133 0.133 Mazdoor skilled day 0.665 0.665 0.665 Mazdoor day 2.660 2.660 2.660 b) Machinery Tractor-trolley hour 1.000 1.000 1.000 c) Material Hard wood sticks Nr 8.000 8.000 8.000 Binding Material Rm 5.000 5.000 5.000 d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d) Cost for 10 Rm = a+b+c+d+e Rate per Rm = (a+b+c+d+e)/ 10					
19.04	Suggestive	Contraction and laying of brush Layers across the slope complete as per drawing and additional Technical specification. Unit = sqm Taking output = 100 sqm a) Labour Mate day 0.160 0.160 0.160 Mazdoor for preparation of ground day 3.990 3.990 3.990 b) Machinery Water tanker 6 Kl capacity including watering for 3 months hour 2.000 2.000 2.000 Tractor-trolley hour 0.500 0.500 0.500 c) Material Live Sods (.6m Length) Nr 1000.000 1000.000 1000.000 Farm yard manure @ 0.18 cum per 100 sqm at site of work cum 0.180 0.180 0.180 Cost of water KL 12.000 12.000 12.000 Grass Kg 100.000 100.000 100.000 d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d) Cost for 100 sqm = a+b+c+d+e Rate per sqm = (a+b+c+d+e)/ 100					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.05	Suggestive	Construction of vegetative Palisades in Rills using hard wood cutting complete as per drawing and additional Technical specification. Unit = Rm Taking output = 2 Rm					
		a) Labour					
		Mate	day	0.019	0.019	0.019	
		Mazdoor skilled	day	0.133	0.133	0.133	
		Mazdoor	day	0.354	0.354	0.354	
		b) Machinery					
		Tractor-trolley	hour	0.250	0.250	0.250	
		c) Material					
		Horizontal Live Sods (2M Length)	Nr	2.000	2.000	2.000	
		Vertical Live Sods (2 M Length)	Nr	40.000	40.000	40.000	
		Cost of water	KL	0.100	0.100	0.100	
		Binding Material	Rm	5.000	5.000	5.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 2 M = a+b+c+d+e					
		Rate per Rm = (a+b+c+d+e)/ 2					
19.06	Suggestive	Laying of Palisades in Slopes complete as per drawing and additional Technical specification. Unit = sqm Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor for preparation of ground	day	3.990	3.990	3.990	
		b) Machinery					
		Water tanker 6 kl including watering for 3 months	hour	2.000	2.000	2.000	
		Tractor-trolley	hour	0.500	0.500	0.500	
		c) Material					
		Live Sods (.6m Length)	Nr	1000.000	1000.000	1000.000	
		Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	0.180	0.180	0.180	
		Cost of water	KL	12.000	12.000	12.000	
		Grass	Kg	100.000	100.000	100.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 100 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/ 100					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.07	Suggestive	Dust suppression Sprinkling of water in the settlement and working area as per instruction of Engineer. Unit = 6 KL Taking output = 6 KL a) Labour Mate day 0.011 0.011 0.011 Mazdoor day 0.266 0.266 0.266 b) Machinery Water tanker 6 KL capacity hour 0.750 0.750 0.750 c) Materials Cost of Water KL 6.000 6.000 6.000 d) Overhead charges @ on (a+b+c) @ on (a+b+c) @ on (a+b+c) e) Contractor's profit @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d) Cost for 6 KL = a+b+c+d+e					
19.08	Suggestive	Water Quality Monitoring (Grab Sample as per the monitoring locations mention in the EIA/EMP report or one sample/10 km length) Unit = Number Taking output = One Number a) Cost of Water Quality Monitoring Nos. 1.000 1.000 1.000 b) Overhead charges @ on (a) @ on (a) @ on (a) c) Contractor's profit @ on (a+b) @ on (a+b) @ on (a+b) Rate per number = a+b+c					
19.09	Suggestive	Soil Quality Monitoring (Grab Sample as per the monitoring locations mention in the EIA/EMP report or one sample/10 km length) Unit = Number Taking output = One Number a) Cost of Soil Quality Monitoring Nos. 1.000 1.000 1.000 b) Overhead charges @ on (a) @ on (a) @ on (a) c) Contractor's profit @ on (a+b) @ on (a+b) @ on (a+b) Rate per number = a+b+c					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.10	Suggestive	Ambient Air Quality Monitoring 24 hrs continuous for location as mention in the EIA/EMP report or one monitoring location within 10 km radius Unit = Number Taking output = One Number a) Cost of Ambient Air Quality b) Overhead charges c) Contractor's profit Rate per number = a+b+c	Nos.	1.000	1.000	1.000	
				@ on (a)	@ on (a)	@ on (a)	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	
19.11	Suggestive	Ambient Noise Monitoring 24 hour continuous (To be carried out as per the location mention in the EIA/EMP report Unit = Number Taking output = One Number a) Cost of Ambient Noise Monitoring 24 hour continuous b) Overhead charges c) Contractor's profit Rate per number = a+b+c	Nos.	1.000	1.000	1.000	
				@ on (a)	@ on (a)	@ on (a)	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	
19.12	Suggestive	Consent Approvals (Once) Unit = Number Taking output = One Number (i) a) Consent to Establish (CTE) b) Overhead charges c) Contractor's profit Rate per number = a+b+c (ii) a) Consent to Operate (CTO) b) Overhead charges c) Contractor's profit Rate per number = a+b+c	Nos.	1.000	1.000	1.000	
				@ on (a)	@ on (a)	@ on (a)	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ on (a)	@ on (a)	@ on (a)	
				@ on (a+b)	@ on (a+b)	@ on (a+b)	
19.13	Suggestive	Compliance submission for Consent Approvals (Half Yearly) Unit = Number Taking output = One Number					

CHAPTER: 19 - ENVIRONMENTAL & SAFETY MANAGEMENT AND BIO ENGINEERING

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) a) compliance submission for Consent to Establish (CTE)	Nos.	1.000	1.000	1.000	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per number = a+b+c					
		(ii) a) compliance submission for Consent to Operate (CTO)	Nos.	1.000	1.000	1.000	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per number = a+b+c					
19.14	Suggestive	Environmental Clearance Compliance (Half Yearly) Unit = Number Taking output = One Number					
		a) Cost of Workshop	Nos.	1.000	1.000	1.000	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per number = a+b+c					
19.15	Suggestive	Environmental Workshops (Half Yearly) Unit = Number Taking output = One Number					
		a) Cost of Workshop	Nos.	1.000	1.000	1.000	
		b) Overhead charges		@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per number = a+b+c					
19.16	Suggestive	Pollution prevention Silt fencing on either side of the streams and rivers including erection and maintenance for entire construction phase. Unit = Rm Taking output = 100 Rm					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Tractor-trolley	hour	2.000	2.000	2.000	
		c) Material					
		Silt Fence Sheet	Sqm	100.000	100.000	100.000	
		Hard wood sticks	Nos.	34.000	34.000	34.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+vc+d)	
		Cost for 100 Rm= a+b+c+d+e					
		Rate per Rm = (a+b+c+d+e)/100					
19.17	IRC-SP-88	Road Safety Audit during Construction Period & Maintenance Period Road Safety Audit during Construction Period & Maintenance Period including collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification report, submission of GAP report, Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter report, Submission of audit report of work zone safety, workshop report and Final Safety report complete as per IRC-SP-88 and directed by engineer.					
		Unit = Kilometer					
	A	Upto 50.00 Kilometer					
		a) Experts/Key Personnel					
		Sr. Road Safety/Auditor/ Team Leader	Month	4	4	4	
		Traffic Planner	Month	6	6	6	
		b) Boarding & Loading					
		Boarding & Loading and Per Diem for Site Visits.	Days	90.000	90.000	90.000	
		Transportation at site and Head Office	No. of Trip	20.000	20.000	20.000	
		Duty travel to Site	Days	90.000	90.000	90.000	
		c) Reports and Documents Cost					
		Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5	
		Submission of GAP report	No. of Copies	5	5	5	
		Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter.	No. of Copies	5	5	5	
		Submission of audit report of work zone safety	No. of Copies	5	5	5	
		workshop report.	No. of Copies	5	5	5	
		Final Safety report	No. of	5	5	5	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

Copies

Add 10 percent of cost of a+b+c as
Miscellaneous work

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Rate for Upto 50.00 Kilometer = (a+b+c+d+e)

B Between 50.00 Km. to 100.00 Km.

a) Experts/Key Personnel

Sr. Road Safety/Auditor/ Team Leader	Month	6	6	6
Traffic Planner	Month	8	8	8

b) Boarding & Loading

Boarding & Loading and Per Diem for Site Visits.		126.000	126.000	126.000
Transportation at site and Head Office		20.000	20.000	20.000
Duty travel to Site		126.000	126.000	126.000

c) Reports and Documents Cost

Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5
Submission of GAP report	No. of Copies	5	5	5
Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter	No. of Copies	5	5	5
Submission of audit report of work zone safety	No. of Copies	5	5	5
Workshop report.	No. of Copies	5	5	5
Final Safety report	No. of Copies	5	5	5

Add 10 percent of cost of a+b+c as Miscellaneous work

d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Rate for 50.00 to 100.00 Kilometer = (a+b+c+d+e)

CHAPTER: 19 - ENVIRONMENTAL & SAFETY MANAGEMENT AND BIO ENGINEERING

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.17	C	More than 100 Km.					
		a) Experts/Key Personnel					
		Sr. Road Safety/Auditor/ Team Leader	Month	8	8	8	
		Traffic Planner	Month	10	10	10	
		b) Boarding & Loading					
		Boarding & Loading and Per Diem for Site Visits.		162.000	162.000	162.000	
		Transportation at site and Head Office		20.000	20.000	20.000	
		Duty travel to Site		162.000	162.000	162.000	
		c) Reports and Documents Cost					
		Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5	
		Submission of GAP report	No. of Copies	5	5	5	
		Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter.	No. of Copies	5	5	5	
		Submission of audit report of work zone safety	No. of Copies	5	5	5	
		workshop report.	No. of Copies	5	5	5	
		Final Safety report	No. of Copies	5	5	5	
		Add 1 percent of cost of a+b+c as Miscellaneous work					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Rate for More than 100.00 Kilometer = (a+b+c+d+e)

19.18	IRC-SP-88	Road Safety Audit during Maintenance Period Road Safety Audit during Maintenance Period including collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification report, submission of GAP report, Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter report, submission of audit report of work zone safety (Maintenance work), workshop report and Final Safety report complete as per IRC-SP-88 and directed by engineer.
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CHAPTER: 19 - ENVIRONMENTAL & SAFETY MANAGEMENT AND BIO ENGINEERING

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Unit = Kilometer							
A	Upto 50.00 Kilometer						
a)	Experts/Key Personnel						
	Sr. Road Safety/Auditor/ Team Leader	Month	2	2	2		
	Traffic Planner	Month	3	3	3		
b)	Boarding & Loading						
	Boarding & Loading and Per Diem for Site Visits.	Days	45.000	45.000	45.000		
	Transportation at site and Head Office	No. of Trip	20.000	20.000	20.000		
	Duty travel to Site	Days	45.000	45.000	45.000		
c)	Reports and Documents Cost						
	Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5		
	Submission of GAP report	No. of Copies	5	5	5		
	Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter	No. of Copies	5	5	5		
	Submission of audit report of work zone safety (Maintenance work)	No. of Copies	5	5	5		
	workshop report.	No. of Copies	5	5	5		
	Final Safety report	No. of Copies	5	5	5		
	Add 10 percent of cost of a+b+c as Miscellaneous work						
d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
Rate for Upto 50.00 Kilometer = (a+b+c+d+e)							
B	Between 50.00 Km. to 100 Km.						
a)	Experts/Key Personnel						
	Sr. Road Safety/Auditor/ Team Leader	Month	3	3	3		
	Traffic Planner	Month	4	4	4		
b)	Boarding & Loading						
	Boarding & Loading and Per Diem for Site Visits.	Days	45.000	45.000	45.000		
	Transportation at site and Head Office	No. of Trip	20.000	20.000	20.000		
	Dutv travel to Site	Days	45.000	45.000	45.000		

CHAPTER: 19 - ENVIRONMENTAL & SAFETY MANAGEMENT AND BIO ENGINEERING

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Reports and Documents Cost					
		Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5	
		Submission of GAP report	No. of Copies	5	5	5	
		Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter	No. of Copies	5	5	5	
		Submission of audit report of work zone safety (Maintenance work)	No. of Copies	5	5	5	
		Workshop report.	No. of Copies	5	5	5	
		Final Safety report	No. of Copies	5	5	5	
		Add 10 percent of cost of a+b+c as Miscellaneous work					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate for 50.00 to 100.00 Kilometer = (a+b+c+d+e)					
C		More than 100 Km.					
		a) Experts/Key Personnel					
		Sr. Road Safety/Auditor/ Team Leader	Month	4	4	4	
		Traffic Planner	Month	5	5	5	
		b) Boarding & Loading					
		Boarding & Loading and Per Diem for Site Visits.	Days	45.000	45.000	45.000	
		Transportation at site and Head Office	No. of Trip	20.000	20.000	20.000	
		Duty travel to Site	Days	45.000	45.000	45.000	
		c) Reports and Documents Cost					
		Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5	
		Submission of GAP report	No. of Copies	5	5	5	
		Road Safety Audit Reports on all activities which were planned, actually executed and planned for	No. of Copies	5	5	5	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		the next quarter					
		Submission of audit report of work zone safety (Maintenance work)	No. of Copies	5	5	5	
		Workshop report.	No. of Copies	5	5	5	
		Final Safety report	No. of Copies	5	5	5	
		Add 10 percent of cost of a+b+c as Miscellaneous work					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate for More than 100.00 Kilometer = (a+b+c+d+e)					

CHAPTER – 20

USAGE RATES OF PLANT AND MACHINERY

PREAMBLE:

1. The hourly owning and operating cost of equipment comprises the following elements:

a) Ownership Cost

- i) Interest on capital investment;
- ii) Insurance cost; and
- iii) Depreciation cost.
- iv) Taxes and duties: This list is just indicative

b) Operational Cost

- i) Fuel/energy and lubricants charges;
- ii) Operation and maintenance crew charges;
- iii) Repair charges; and
- iv) Miscellaneous supplies

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
1	Dozer - 240 HP	Spreading Cutting Clearing	240	Hour	6446.00
2	Dozer - 175 HP	Spreading Cutting Clearing	175	Hour	4971.00
3	Dozer - 90 HP	Spreading Cutting Clearing	90	Hour	3401.00
4	Motor Grader 4.3 metre blade	Clearing Scarifying Spreading GSB WMM	186	Hour	5991.00
5	Motor Grader 3.7 metre blade	Clearing Scarifying Spreading GSB WMM	171	Hour	5497.00
6	Motor Grader 3.35 metre blade	Clearing Scarifying Spreading GSB WMM	110	Hour	4796.00
7	Hydraulic Excavator of 1.2 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	188	Hour	3420.00
8	Hydraulic Excavator of 1.1 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	162	Hour	3074.00
9	Hydraulic Excavator of 0.9 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	138	Hour	2782.00
10	Jack Hammer (attachment of Hydraulic Excavator)	For Drilling Purpose	-	Hour	206.00
11	Front End loader 3.1 cum bucket capacity	Soil loading Aggregate loading, etc.	221	Hour	4228.00
12	Front End loader 2.1 cum bucket capacity	Soil loading Aggregate loading, etc.	150	Hour	2618.00
13	Backhoe-loader 1 cum bucket capacity	Soil loading Aggregate loading, etc.	92	Hour	1780.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
14	Tipper-18 Cum	Transpotation of Soil, GSB,WMM, Hotmix etc.	280	Hour	2845.00
15	Tipper-18 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	275	Per Tonne Km	6.10
16	Tipper-18 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	275	Per Tonne Km	14.818
17	Tipper-18 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	275	Per Tonne Km	14.82
18	Tipper-14 Cum	Transpotation of Soil, GSB,WMM, Hotmix etc.	220	Hour	2513.00
19	Tipper -14 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Per Tonne Km	6.89
20	Tipper -14 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Per Tonne Km	16.75
21	Tipper -14 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Per Tonne Km	16.75
22	Tipper-10 Cum	Transpotation of Soil, GSB,WMM, Hotmix etc.	178	Hour	2229.00
23	Tipper -10 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	178	Per Tonne Km	8.49
24	Tipper -10 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	178	Per Tonne Km	20.64
25	Tipper -10 Cum (Katcha Track)	Transpotation of Soil, GSB,WMM, Hotmix etc.	178	Per Tonne Km	20.64
26	Tipper-5.5 Cum	Transpotation of Soil, GSB,WMM, Hotmix etc.	90	Hour	1681.00
27	Tipper- 5.5 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Per Tonne Km	11.53

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
28	Tipper- 5.5 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Per Tonne Km	28.02
29	Tipper- 5.5 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Per Tonne Km	28.02
30	Vibratory Soil Compactor (10 tonne)	Earth/Soil, GSB, WMM	99	Hour	2511.00
31	Smooth Wheeled Roller 8 tonne	Soil Compaction BM Compaction	98	Hour	2038.00
32	Tandem Roller	Rolling of Asphalt Surface	99	Hour	2501.00
33	Mini Tandem Roller	Earth/Soil	44	Hour	1401.00
34	Pneumatic Road Roller	Rolling of Asphalt Surface	114	Hour	2523.00
35	Water Tanker (16 KL)	Water Transport	150	Hour	1501.00
36	Water Tanker (12 KL)	Water Transport	150	Hour	1327.00
37	Water Tanker (6 KL)	Water Transport	100	Hour	1005.00
38	Tractor-trolley	Pulling, Tranportation,etc.	42	Hour	904.00
39	Rotavator	Scarifying	-	Hour	16.00
40	Ripper	Scarifying	-	Hour	21.00
41	Air Compressor -250 cfm	General Purpose	5	Hour	591.00
42	Air Compressor -500 cfm	General Purpose	148	Hour	2808.00
43	Integrated Stone Crusher Stone (3 Stage) 250 TPH	Crushing of Spalls	-	Hour	14744.00
44	Wet Mix Plant - 250 TPH Capacity	Wet Mix	-	Hour	878.00
45	Wet Mix Plant - 200 TPH Capacity	Wet Mix	-	Hour	583.00
46	Wet Mix Plant - 100 TPH Capacity	Wet Mix	-	Hour	558.00
47	Hotmix Plant - 200 TPH Capacity	DBM / BM / BC / Premix etc.	-	Hour	14553.00
48	Hotmix Plant - 160 TPH Capacity	DBM / BM / BC / Premix etc.	-	Hour	10338.00
49	Hotmix Plant - 120 TPH capacity	DBM / BM / BC / Premix etc.	-	Hour	8343.00
50	Batching and Mixing Plant - 240 cum Capacity	Concrete Mixing	-	Hour	6013.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
51	Batching and Mixing Plant - 120 cum Capacity	Concrete Mixing	-	Hour	3909.00
52	Mobile Concrete Batching / Mixing Plant	Concrete Mixing	60	Hour	960.00
53	Concrete Mixer - 0.4/0.28 cum	Concrete Mixing	10	Hour	492.00
54	Concrete Mixer - 1 cum	Concrete Mixing	15	Hour	533.00
55	Generator 725 KVA	Generation of Electric Energy	777	Hour	12030.00
56	Generator 500 KVA	Generation of Electric Energy	536	Hour	8320.00
57	Generator 400 KVA	Generation of Electric Energy	430	Hour	6707.00
58	Generator 250 KVA	Generation of Electric Energy	303	Hour	4728.00
59	Generator 125 KVA	Generation of Electric Energy	154	Hour	2472.00
60	Generator 100 KVA	Generation of Electric Energy	129	Hour	2108.00
61	Generator 62.5 KVA	Generation of Electric Energy	80	Hour	1351.00
62	Generator 33 KVA	Generation of Electric Energy	42	Hour	771.00
63	Generator 15 KVA	Generation of Electric Energy	20	Hour	431.00
64	Mechanical Broom Hydraulic	Surface Cleaning	50	Hour	1046.00
65	Bitumen Pressure Distributor	Applying bitumen tack coat	170	Hour	1711.00
66	Emulsion Pressure Distributor	Applying bitumen tack coat	170	Hour	1711.00
67	Bitumen Boiler Oil Fired	Bitumen Spraying	50	Hour	727.00
68	Mastic Cooker	Mastic Wearing Coat	10	Hour	640.00
69	Paver Finisher Mechanical	Paving of WMM	123	Hour	2526.00
70	Paver Finisher Hydrostatic with sensor control -240 HP	Paving of DBM / BM / BC / Premix etc.	240	Hour	8916.00
71	Paver Finisher Hydrostatic with sensor control -170 HP	Paving of DBM / BM / BC / Premix etc.	170	Hour	7057.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
72	Paver Finisher Concrete with 300 HP Motor	Paving of Concrete Surface	300	Hour	26922.00
73	Paver Finisher Concrete with 241 HP Motor	Paving of Concrete Surface	241	Hour	17458.00
74	Paver Finisher Concrete with 118 HP Motor	Paving of Concrete Surface	118	Hour	4362.00
75	Texture Curing Machine (TCM) - upto 18 m	Texturing of Concrete Surface	55	Hour	4628.00
76	Texture Curing Machine (TCM) - upto 9 m	Texturing of Concrete Surface	55	Hour	3654.00
77	Hydraulic Chip Spreader	Surface Dressing	200	Hour	2217.00
78	Pot-Hole Repair Machine	Repair of pot-holes	178	Hour	1802.00
79	Transit Mixer - 6 Cum	Mix to Site Transportation of Concrete	178	Hour	2367.00
80	Concrete Pump	Pumping of Concrete	15	Hour	1297.00
81	Boom Placer	Pumping of Concrete	178	Hour	4260.00
82	Kerb Casting Machine	Kerb Making	50	Hour	1889.00
83	Piling Rig with Bentonite Pump	Piling in foundation	360	Hour	19264.00
84	Pneumatic Sinking Plant	Sinking Purpose	250	Hour	6908.00
85	Road marking machine	Road Marking	90	Hour	1973.00
86	Mobile Slurry Seal Equipment	Mixing and laying slurry seat	115	Hour	3852.00
87	Joint Cutting Machine	Cutting Purpose	5	Hour	493.00
88	Bar Bending & Cutting Machine	Bar Cutting & Bending	5	Hour	509.00
89	Needle Vibrator	Concrete pouring	5	Hour	569.00
90	Jack Hammer for air compressor	General Purpose	-	Hour	11.00
91	Plate Compactor	Compaction	8	Hour	575.00
92	Milling Machine with 1 meter Drum Width	Milling of bitumen surface	155	Hour	4635.00
93	Milling Machine with 1.2 meter Drum Width	Milling of bitumen surface	208	Hour	5432.00
94	Milling Machine With 1.3 meter Drum Width	Milling of bitumen surface	330	Hour	7793.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
95	Milling Machine With 2 meter Drum Width	Milling of bitumen surface	500	Hour	11665.00
96	Cold in Situ recycling of bitumen's pavement with foam bitumen technology	Recycling of bitumen surface	602	Hour	29649.00
97	In situ stabilisation of WMM/GSB/Sub grade	Stabilisation of WMM/GSB/Sub grade	602	Hour	25774.00
98	Cement spreader	Spreading	350	Hour	8083.00
99	Mobile cold recycling mixing plant	Recycling of bitumen surface	300	Hour	21483.00
100	Hot in place recycling	Recycling of bitumen surface	322	Hour	103644.00
101	Pre heater unit for hot in place recycling	Recycling of bitumen surface	101	Hour	1262.00
102	Single boom Hydraulic Drill Jumbo	Drilling Purpose	78	Hour	5187.00
103	Two boom Hydraulic Drill Jumbo	Drilling Purpose	160	Hour	7880.00
104	Three boom Hydraulic Drill Jumbo	Drilling Purpose	240	Hour	11513.00
105	Hydraulic Rock bolt drill	Drilling Purpose	90	Hour	7445.00
106	Rotating Telehandlers	General Purpose	101	Hour	1185.00
107	Shotcrete Machine	Concreting Purpose	90	Hour	1765.00
108	Grouting machine	Grouting Purpose	8	Hour	762.00
109	Dewatering Pump 10 HP	Dewatering	10	Hour	326.00
110	Concrete cutting machine	Concrete cutting Purpose	5	Hour	216.00
111	Crawler mounted Crane 35 tonne capacity	Lifting Purpose	170	Hour	6137.00
112	Crawler mounted Crane 80 tonne capacity	Lifting Purpose	230	Hour	6413.00
113	Crawler mounted Crane 100 tonne capacity	Lifting Purpose	300	Hour	9693.00
114	Mobile Hydraulic Crane 3 tonne capacity	Lifting Purpose	42	Hour	1059.00
115	Mobile Hydraulic Crane 5 tonne capacity	Lifting Purpose	45	Hour	1104.00
116	Mobile Hydraulic Crane 10 tonne capacity	Lifting Purpose	48	Hour	1212.00
117	Mobile Hydraulic Crane 15 tonne capacity	Lifting Purpose	49	Hour	1249.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
118	Mobile Hydraulic Crane 20 tonne capacity	Lifting Purpose	101	Hour	1573.00
119	Mobile Hydraulic Crane 35 toone capacity	Lifting Purpose	173	Hour	2390.00
120	Concrete Bucket	For Purring Concrete		Hour	146.00
121	Prestressing Jack with Pump & Access (400 tonne)	Stressing of Steel Wires/Stand		Hour	533.00
122	Boat to carry at least 20 persons	General Purpose		hour	941.00
123	Crane with grab 0.75 cum capacity	Lifting Purpose		hour	1068.00
124	Epoxy Injection gun			hour	366.00
125	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking	Well sinking		hour	9721.00
126	Jack for Lifting 40 tonne lifting capacity	Lifting Purpose		hour	360.00
127	Vibrating Pile driving hammer complete with power unit and accessories	Pile driving		hour	18143.00
128	Transit Mixer - 6 Cum	Mix to Site Transportation of Concrete		Per Tonne Km	26.30
129	Centrifugal water pump	Water Pumping		Hour	389.00
130	Shredding Machine	Shredding of waste Plastic		Hour	549.00
131	Mobile Bridge Inspection Unit (MBIU)	For Inspection of Bridge		Hour	7091.00
132	Network Survey Vehicle (NSV) With SUV	For Pavement Inspection/Survey Purpose		Hour	6415.00
133	Falling weight deflectometer (FWD) Equipment With SUV	For Testing Purpose		Hour	3248.00
134	Retroreflectometer testing equipment with Vehicle With SUV	For Testing Retro reflection		Hour	1888.00
135	Sport utility vehicle (SUV)	General Purpose		Hour	1299.00
136	Automatic Vehicle Counter Classifier (ATCC) System	Traffic Counting		Hour	76.00

Note:- The usage rates given above are for the base year 2019-20 and derived based on the fuel & labour rate of Chhattisgarh region. Concerned States / UT's should update the same while preparing the SOR.

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.01	(A)	Cement Mortar 1:3 (1 cement : 3 sand) Unit = cum Taking output = 1 cum			
	a)	Materials			
		Cement	tonne	0.510	
		Coarse sand	cum	1.050	
		Cost of water	KL	0.255	
	b)	Labour			
		Mate	day	0.048	
		Mazdoor	day	1.197	
	c)	Machinery			
		Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.005 x L1 + 0.014	
		Rate per cum = (a+b+c)			
21.01	(B)	Cement Mortar1:2 (1cement :2 sand) Unit = cum Taking output = 1 cum			
	a)	Materials			
		Cement	tonne	0.672	
		Coarse sand	cum	0.930	
		Cost of water	KL	0.336	
	b)	Labour			
		Mate	day	0.048	
		Mazdoor	day	1.197	
	c)	Machinery			
		Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.006 x L1 + 0.019	
		Rate per cum = (a+b+c)			
21.01	(C)	Cement Mortar1:4 (1cement :4 sand) Unit =cum Taking output = 1 cum			
	a)	Materials			
		Cement	tonne	0.403	
		Coarse sand	cum	1.120	
		Cost of water	KL	0.202	
	b)	Labour			
		Mate	day	0.048	
		Mazdoor	day	1.197	
	c)	Machinery			
		Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.004 x L1 + 0.011	
		Rate per cum = (a+b+c)			

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.01	(D)	Cement Mortar 1:6 (1 cement : 6 sand) Unit = cum Taking output = 1 cum			
	a)	Materials			
		Cement	tonne	0.288	
		Coarse sand	cum	1.337	
		Cost of water	KL	0.144	
	b)	Labour			
		Mate	day	0.048	
		Mazdoor	day	1.197	
	c)	Machinery			
		Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.003 x L1 + 0.008	
		Rate per cum = (a+b+c)			
21.02		PCC 1:3:6 using batching Plant Plain cement concrete 1:3:6 nominal mix with crushed stone aggregate 40 mm nominal size mechanically mixed Unit = cum Taking output = 15 Cum			
	a)	Labour			
		Mate	day	0.426	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	9.310	
	b)	Material			
		40 mm Aggregate	cum	13.500	
		Coarse sand	cum	6.750	
		cement	tonne	3.450	
		Cost of water	KL	1.380	
	c)	Machinery			
		Batching Plant of capacity 120 cum/hour	hour	0.179	
		Generator 250 KVA	hour	0.179	
		Loader 3.1 cum capacity	hour	0.431	
		Transit truck agitator			
		For loading & Unloading time	hour	0.179	
		Rate per cum = (a+b+c)/15			
	Note	Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.			
21.03		Plain/Reinforced Cement Concrete complete as per Drawing and Technical Specifications. PCC Grade M15 Using Batching Plant Unit = cum Taking output = 360 Cum			
	a)	Material			
		Cement	tonne	99.000	
		Coarse sand	cum	162.000	
		40 mm Aggregate	cum	194.400	
		20 mm Aggregate	cum	97.200	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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		10 mm Aggregate	cum	32.400	
		Cost of water (Water/Cement Ratio - 0.4)	KL	39.600	
b)	Labour				
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
c)	Machinery				
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	

**Per Cum Basic Cost of Labour, Material & Machinery
(a+b+c)/360**

21.04

PCC Grade M20 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a)	Material				
		Cement	tonne	123.840	
		Coarse sand	cum	162.000	
		40 mm Aggregate	cum	129.600	
		20 mm Aggregate	cum	129.600	
		10 mm Aggregate	cum	64.800	
		Cost of water (Water/Cement Ratio - 0.4)	KL	49.536	
b)	Labour				
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
c)	Machinery				
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.05

RCC Grade M20 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a)	Material				
		Cement	tonne	124.980	
		Coarse Sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Cost of water	KL	49.992	
b)	Labour				
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.06		PCC Grade M25 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	143.850	
		Coarse sand	cum	162.000	
		40 mm Aggregate	cum	129.600	
		20 mm Aggregate	cum	129.600	
		10 mm Aggregate	cum	64.800	
		Cost of water	KL	57.540	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.07		RCC Grade M25 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	145.140	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.2 % of Cement	Kg	290.280	
		Cost of water	KL	58.056	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.08		PCC Grade M30 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	145.800	
		Coarse sand	cum	162.000	
		40 mm Aggregate	cum	129.600	
		20 mm Aggregate	cum	129.600	
		10 mm Aggregate	cum	64.800	
		Cost of water	KL	58.320	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.09		RCC Grade M30 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	146.400	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.3 % of Cement	Kg	439.200	
		Cost of water	KL	58.560	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.10		PCC Grade M35 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	150.840	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.3 % of Cement	Kg	452.520	
		Cost of water	KL	60.336	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.11		RCC Grade M35 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	151.920	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.4 % of Cement	Kg	607.680	
		Cost of water	KL	60.768	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.12		RCC Grade M40 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	154.800	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.8 % of Cement	Kg	1238.400	
		Cost of water	KL	61.920	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			

21.13

RCC Grade M45 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material					
Cement	tonne	154.800			
Coarse sand	cum	162.000			
20 mm Aggregate	cum	194.400			
10 mm Aggregate	cum	129.600			
Admixture @ 1 % of Cement	Kg	1548.000			
Cost of water	KL	61.920			
b) Labour					
Mate	day	0.213			
Skilled Mazdoor	day	1.330			
Mazdoor	day	3.990			
c) Machinery					
Batching Plant of capacity 120 cum/hour	hour	4.286			
Generator 250 KVA	hour	4.286			
Loader 3.1 cum capacity	hour	10.340			
Transit truck agitator					
For loading & Unloading time	hour	4.286			
Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360					

21.14

RCC Grade M50 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material					
Cement	tonne	154.800			
Coarse sand	cum	162.000			
20 mm Aggregate	cum	194.400			
10 mm Aggregate	cum	129.600			
Admixture @ 0.8 % of Cement	Kg	1238.400			
Silica Fume @ 5% of Cement	Kg	7740.000			
Cost of water	KL	61.920			
b) Labour					
Mate	day	0.213			
Skilled Mazdoor	day	1.330			
Mazdoor	day	3.990			
c) Machinery					
Batching Plant of capacity 120 cum/hour	hour	4.286			
Generator 250 KVA	hour	4.286			
Loader 3.1 cum capacity	hour	10.340			
Transit truck agitator					
For loading & Unloading time	hour	4.286			
Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360					

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.15		RCC Grade M55 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	158.400	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 1 % of Cement	Kg	1267.200	
		Silica Fume @ 5% of Cement	Kg	7920.000	
		Cost of water	KL	63.360	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.16		RCC Grade M60 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	160.200	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 1 % of Cement	Kg	1281.600	
		Silica Fume @ 6% of Cement	Kg	9612.000	
		Cost of water	KL	64.080	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.17		RCC Grade M65 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		a) Material			
		Cement	tonne	162.000	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 1 % of Cement	Kg	1296.000	
		Silica Fume @ 6% of Cement	Kg	9720.000	
		Cost of water	KL	64.800	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.18	601	A DLC Using Batching Plant-240 cum capacity Plant			
		Unit = cum			
		Taking output = 450 Cum			
		a) Material			
		Cement @ 150 kg/cum of concrete	tonne	67.500	
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500	
		Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.	cum	405.000	
		Cost of water (Water/Cement Ratio - 0.4)	KL	27.000	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 240 cum/hour	hour	2.679	
		Generator 250 KVA	hour	2.679	
		Loader 3.1 cum capacity	hour	12.926	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450			
21.18	601	B Dry Lean Cement Concrete Sub- base Flyash (Using Batching Plant)-240 cum capacity Plant			
		Unit = cum			
		Taking output = 450 Cum			
		a) Material			
		Cement @ 129 kg/cum of concrete	tonne	57.860	
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500	
		Crushed stone coarse aggregate of 25 mm and	cum	405.000	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.			
		Fly ash conforming to IS: 3812-1966 (Part-I)	cum	9.640	
		Cost of water (Water/Cement Ratio - 0.4)	KL	23.144	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 240 cum/hour	hour	2.679	
		Generator 250 KVA	hour	2.679	
		Loader 3.1 cum capacity	hour	12.926	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450

Note Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.

***Calculation of cement and fly ash.**

Cement @ 150 kg/cum = 450 x 150 = 67.500 tonnes.

20 percent of cement to be replaced by fly ash = 13.50 tonnes.

Balance cement = 54.0 tonnes.

Quantity of fly ash = 13.50 x specific gravity of fly ash / specific gravity of cement = 13.50 x 2.25/3.15 = 9.64 tonnes.

21.18	601	C	DLC Using Batching Plant-120 cum capacity Plant		
			Unit = cum		
			Taking output = 450 Cum		
		a) Material			
		Cement @ 150 kg/cum of concrete	tonne	67.500	
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500	
		Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.	cum	405.000	
		Cost of water (Water/Cement Ratio - 0.4)	KL	27.000	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	5.357	
		Generator 250 KVA	hour	5.357	
		Loader 3.1 cum capacity	hour	12.926	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.18	601	D Dry Lean Cement Concrete Sub- base Flyash (Using Batching Plant) -120 cum capacity Plant Unit = cum Taking output = 450 Cum			
		a) Material			
		Cement @ 150 kg/cum of concrete	tonne	57.860	
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500	
		Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.	cum	405.000	
		Fly ash conforming to IS: 3812-1966 (Part-I)	cum	9.640	
		Cost of water (Water/Cement Ratio - 0.4)	KL	23.144	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	5.357	
		Generator 250 KVA	hour	5.357	
		Loader 3.1 cum capacity	hour	12.926	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450			
		Note Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.			
		*Calculation of cement and fly ash.			
		Cement @ 150 kg/cum = 450 x 150 = 67.500 tonnes.			
		20 Percent of cement to be replaced by fly ash = 13.50 tonnes.			
		Balance cement = 54.0 tonnes.			
		Quantity of fly ash = 13.50 x specific gravity of fly ash /specific gravity of cement = 13.50 x 2.25/3.15 = 9.64 tonnes.			
21.19	602	A PQC M 35 grade Using Batching Plant-240 cum capacity Plant Unit =cum Taking output = 900 Cum			
		a) Material			
		Cement @ 400 kg/cum of concrete	tonne	360.000	
		Coarse sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete	cum	405.000	
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000	
		Admixture @ 0.5 % of Cement	Kg	1800.000	
		Cost of water	KL	144.000	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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c) Machinery

Batching Plant of capacity 240 cum/hour	hour	5.357
Generator 250 KVA	hour	5.357
Loader 3.1 cum capacity	hour	25.851
Transit truck agitator		
For loading & Unloading time	hour	5.357

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900

21.19 602

B PQC M 35 grade Using Batching-240 cum capacity Plant (Cement - Flyash)

Unit =cum

Taking output = 900 Cum

a) Material

Cement	tonne	306.000
Fly ash conforming to IS: 3812 (Part-I)	tonne	93.000
Coarse sand	cum	364.500
Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000
Admixture @ 0.5 % of Cement	Kg	1530.000
Cost of water	KL	122.400

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 240 cum/hour	hour	5.357
Generator 250 KVA	hour	5.357
Loader 3.1 cum capacity	hour	24.989
Transit truck agitator		
For loading & Unloading time	hour	5.357

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900

- Note**
1. The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.
 2. IRC: 68 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.

***Calculation of cement, sand and fly ash.**

Cement @ 400 kg/cum = 900 x 400 = 360 tonnes.

15 Percent of cement to be replaced by fly ash = 54.0 tonnes.

Balance cement = 306.00 tonnes.

Quantity of fly ash = 54.00 x specific gravity of fly ash /specific gravity of cement = 54.00 x 2.25/3.15 = 38.571 tonnes.

Sand @ 0.45 cum / cum of concrete = 900 x 0.45 = 405 x 1.6 = 648 tonnes.

10 Percent to be replaced by flyash.

Balance sand = 648 x 0.9 = 583.2 tonnes = 583.02 / 1.6 = 364.5 cum.

Quantity of flyash = (648-583.2) x specific gravity of fly ash/specific gravity of sand = 64.8 x 2.25 / 2.687 = 54.26 tonnes

Fly ash Total fly ash = 38.571 + 54.26 = 92.831 tonnes. (Say 93 tonnes)

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.19	602	C PQC M 35 grade Using Batching Plant-120 cum capacity Unit = cum Taking output = 900 Cum			
		a) Material			
		Cement @ 400 kg/cum of concrete	tonne	360.000	
		Coarse sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete	cum	405.000	
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000	
		Admixture @ 0.5 % of Cement	Kg	1800.000	
		Cost of water	KL	144.000	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	10.714	
		Generator 250 KVA	hour	10.714	
		Loader 3.1 cum capacity	hour	25.851	
		Transit truck agitator			
		For loading & Unloading time	hour	10.714	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900			
21.19	602	D PQC M 35 grade Using Batching Plant-120 cum capacity (Cement - Flyash) Unit= cum Taking output = 900 Cum			
		a) Material			
		Cement	tonne	306.000	
		Fly ash conforming to IS: 3812 (Part-I)	tonne	93.000	
		Coarse sand	cum	364.500	
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000	
		Admixture @ 0.4 % of Cement	Kg	1224.000	
		Cost of water	KL	122.400	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	10.714	
		Generator 250 KVA	hour	10.714	
		Loader 3.1 cum capacity	hour	24.989	
		Transit truck agitator			
		For loading & Unloading time	hour	10.714	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900			

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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- Note**
1. The quantities for cement, coarse aggregate and fine aggregates are for estimating only. The exact quantities will be as per mix design.
 2. IRC: 68 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.

***Calculation of cement, sand and fly ash.**

Cement @ 400 kg/cum = $900 \times 400 = 360$ tonnes.

15 Percent of cement to be replaced by fly ash = 54.0 tonnes.

Balance cement = 306.00 tonnes.

Quantity of fly ash = $54.00 \times \text{specific gravity of fly ash} / \text{specific gravity of cement} = 54.00 \times 2.25 / 3.15 = 38.571$ tonnes.

Sand @ 0.45 cum / cum of concrete = $900 \times 0.45 = 405 \times 1.6 = 648$ tonnes.

10 Percent to be replaced by flyash.

Balance sand = $648 \times 0.9 = 583.2$ tonnes = $583.02 / 1.6 = 364.5$ cum.

Quantity of flyash = $(648 - 583.2) \times \text{specific gravity of fly ash} / \text{specific gravity of sand} = 64.8 \times 2.25 / 2.687 = 54.26$ tonnes

Fly ash Total fly ash = $38.571 + 54.26 = 92.831$ tonnes. (Say 93 tonnes)

21.20 409

PCC Grade M15 Using Batching Plant for Kerb

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	99.000
Coarse sand	cum	162.000
40 mm Aggregate	cum	194.400
20 mm Aggregate	cum	97.200
10 mm Aggregate	cum	32.400
Cost of water (Water/Cement Ratio - 0.4)	KL	39.600

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340

Transit truck agitator

For loading & Unloading time	hour	4.286
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Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.21 409

PCC Grade M20 Using Batching Plant for Kerb

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	123.840
Coarse sand	cum	162.000
40 mm Aggregate	cum	129.600
20 mm Aggregate	cum	129.600
10 mm Aggregate	cum	64.800
Cost of water (Water/Cement Ratio - 0.4)	KL	49.536

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340
Transit truck agitator		
For loading & Unloading time	hour	4.286

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.22

Cost of Water

Unit = KL

Taking output = 12 KL

a) Labour

Mate	day	0.007
Mazdoor	day	0.177

b) Machinery

Centrifugal water pump (600 LMP)	hour	0.615
Water tanker 12 KL	hour	0.615
Cost for 12 KL = a+b		

Rate per KL = (a+b)/12

