MINISTRY OF ROAD TRANSPORT & HIGHWAYS

STANDARD DATA BOOK FOR ANALYSIS OF RATES

(Second Revision - 2019)

Volume-I: For Plain/Rolling Terrain

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

New Delhi
October, 2019

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 TRANSPORT & 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	8%	10%	12%
2	Contractors profit for Road Works	10%	10%	10%
3	Overheads for New/ Widening of Bridge/ Structure Works	20%	20%	20%
4	Overheads for Rehabilitation of Bridges / Structure	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:

A. ROAD WORKS

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

(i) Civil Works Cost up to Rs. 200 crores	12 percent
(ii) Civil Works Cost > Rs. 200 crores and ≤ Rs.500 Crores	10 percent
(iii) Civil Works Cost > Rs. 500 crores	08 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 factor 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 75 percent of the rated capacity given by manufacturer under ideal conditions.

6.3 The water tanker speed @ 20km/hr., return speed @ 30 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 charge 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 material considered in the rate analysis are approximate for the purpose of estimation and includes 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.

8.3 Highly Skilled labour include mason (1st class), carpenter, Blacksmith (I st 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.

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 considered as 25 kmph and empty vehicle is considered as 35 kmph.

ii) The speed of loaded vehicle on gravelled surface road is considered as 20 kmph and empty vehicle speed is considered as 30 kmph.

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 area speed of loaded vehicle on kutcha road is considered as 5 kmph and empty vehicle speed is considered as 7 kmph.

iv) The speed of loaded Transit Mixture is considered as 20 kmph and empty Transit Mixture speed is considered as 30 kmph.

4 Provision has been made for a tractor trolley instead of tipper where dismantled material 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.

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	1.000	
		ii) Loading by front end loader 1 cum bucket capacity	Min	6.633	
		iii) Maneuvering, reversing, dumping and turning for return	Min	2.000	
		iv) Waiting time, unforeseen contingencies etc.	Min	4.000	
		Total	**Min**	**13.633**	
		a) Machinery			
		Tipper 5.5 cum capacity	hour	0.227	
		Front end-loader 1 cum bucket capacity	hour	0.227	
		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	1.000	
		ii) Loading by front end loader 1 cum bucket capacity	Min	12.060	
		iii) Maneuvering, reversing, dumping and turning for return	Min	2.000	
		iv) Waiting time, unforeseen contingencies etc.	Min	4.000	
		Total	**Min**	**19.060**	
		a) Machinery			
		Tipper 10 cum capacity	hour	0.318	
		Front end-loader 1 cum bucket capacity	hour	0.318	
		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.**			

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 cum			
		Time required for			
		i) Positioning of tipper at loading point	Min	1.000	
		ii) Loading by front end loader 2.1 cum bucket capacity	Min	8.029	
		iii) Maneuvering, reversing, dumping and turning for return	Min	2.000	
		iv) Waiting time, unforeseen contingencies etc.	Min	4.000	
		Total	Min	**15.029**	
		a) Machinery			
		Tipper 14 cum capacity	hour	0.250	
		Front end-loader 2.1 cum bucket capacity	hour	0.250	
		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	1.000	
		ii) Loading by front end loader 3.1 cum bucket capacity	Min	6.996	
		iii) Maneuvering, reversing, dumping and turning for return	Min	2.000	
		iv) Waiting time, unforeseen contingencies etc.	Min	4.000	
		Total	**Min**	**13.996**	
		a) Machinery			
		Tipper 18 cum capacity	hour	0.233	
		Front end-loader 3.1 cum bucket capacity	hour	0.233	
		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.**			

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	0.055	
		Mazdoor for loading and unloading	day	1.364	
		b) Machinery			
		Tipper 10 Cum capacity	hour	1.364	
		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	0.144	
		Mazdoor for loading and unloading	day	3.600	
		b) Machinery			
		Truck 18 tonne capacity	hour	3.600	
		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**			
		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			

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		B Case-I : Surfaced 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 : 25 km / hour. Speed while Returning empty: 35 km / hour. **a) Machinery.** **i) Tipper 18 tonne capacity** Time taken for onward haulage with load Time taken for empty return trip. **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**	 hour hour	 0.400 0.286	
		C Case-I : Surfaced Road 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 Time taken for empty return trip. **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**	 hour hour	 0.400 0.286	
		D Case-I : Surfaced 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 : 25 km / hour. Speed while Returning empty: 35 km / hour. **a) Machinery.** **i) Tipper 32 tonne capacity** Time taken for onward haulage with load Time taken for empty return trip. **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**	 hour hour	 0.400 0.286	

Sr No	Ref. to M		Description	Unit	Quantity	Rate (Rs.)
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 : 20 km / hour			
			Speed for empty return trip : 30 km / hour			
			a) Machinery			
			Tipper 10 tonnes capacity			
			Time taken for onward haulage with load	hour	0.500	
			Time taken for empty return trip	hour	0.333	
			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 : 20 km / hour			
			Speed for empty return trip : 30 km / hour			
			a) Machinery			
			Tipper 18 tonnes capacity			
			Time taken for onward haulage with load	hour	0.500	
			Time taken for empty return trip	hour	0.333	
			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			
			Taking output 25 tonnes load and lead 10 km = 250 t.km			
			Speed with load : 20 km / hour			
			Speed for empty return trip : 30 km / hour			
			a) Machinery			
			Tipper 25 tonnes capacity			
			Time taken for onward haulage with load	hour	0.500	
			Time taken for empty return trip	hour	0.333	
			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			

Sr No	Ref. to M		Description	Unit	Quantity	Rate (Rs.)
		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 : 20 km / hour			
			Speed for empty return trip : 30 km / hour			
			a) Machinery			
			Tipper 32 tonnes capacity			
			Time taken for onward haulage with load	hour	0.500	
			Time taken for empty return trip	hour	0.333	
			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			
			I) 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			
			Speed while returning empty : 15 km / hour			
			a) Machinery			
			I) 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			

Sr No	Ref. to M		Description	Unit	Quantity	Rate (Rs.)
		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			
			I) 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			
			I) 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-IV: Katcha Track in hilly area.**			
			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 : 5 km / hour			
			Speed while returning empty : 7 km / hour			
			a) Machinery			
			I) Tipper 10 tonnes capacity			
			Time taken for onward haulage	hour	2.000	
			Time taken for empty return trip	hour	1.429	
			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			

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
1.04	(v)	**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 : 20 km / hour			
		Speed while returning empty : 30 km / hour			
		a) Machinery			
		I) Transit Mixture 6 cum capacity			
		Time taken for onward haulage with load	hour	0.500	
		Time taken for empty return trip	hour	0.333	
		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	0.060	
		Mazdoor	day	1.500	
		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	0.320	
		Mazdoor Skilled	day	2.000	
		Mazdoor	day	6.000	
		b) Material			
		Stone Boulder of size 150 mm and below	cum	750.000	

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		c) Machinery			
		Integrated stone crusher of 250 TPH including belt conveyor and vibrating screens	Hour	6.000	
		Generator 725 KVA	Hour	6.000	
		Front end loader 3.1 cum bucket capacity at quarry and crusher	Hour	5.515	
		Tipper 14 cum capacity for loading at quarry site	Hour	5.515	
		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	
		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 (Basic Cost)	Cum	28.98%	
		20 mm (Basic Cost)	Cum	31.95%	
		10 mm (Basic Cost)	Cum	30.75%	
		Dust (Basic Cost)	Cum	08.32%	
		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

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Taking Output = 750 cum			
		a) Labour			
		Mate	day	0.320	
		Mazdoor Skilled	day	2.000	
		Mazdoor	day	6.000	
		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 (for producing crusher run production capacity will increase by 30%)	Hour	4.615	
		Generator 725 KVA	Hour	4.615	
		Front end loader 3.1 cum bucket capacity at quarry and crusher	Hour	5.515	
		Tipper 14 cum capacity for loading at quarry site	Hour	5.515	
		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 materials 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.

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	0.960	0.960	0.960	
			Mazdoors	day	24.000	24.000	24.000	
			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 lobour 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	1.080	1.080	1.080	
			Mazdoors	day	27.000	27.000	27.000	
			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 lobour 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	2.000	2.000	2.000	
			Mazdoors	day	50.000	50.000	50.000	
			b) Machinery					
			Tipper					

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			(i) 18 cum capacity	hour	1.250			
			(ii) 14 cum capacity	hour		1.667		
			(iii) 10 cum capacity	hour			3.125	
			Sundries @ 1% of lobour 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	3.200	3.200	3.200	
			Mazdoors	day	80.000	80.000	80.000	
			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 lobour 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	0.040	0.040	0.040	
			Mazdoors	day	1.000	1.000	1.000	
			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	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
	(ii)	**Girth from 600 mm to 900 mm**					
		Unit = Each					
		Taking output = 30 nos.					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoors	day	1.000	1.000	1.000	
		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	0.040	0.040	0.040	
		Mazdoors	day	1.000	1.000	1.000	
		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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iv) Girth above 1800 mm					
		Unit = Each					
		Taking output = 20 nos.					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoors	day	1.000	1.000	1.000	
		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	
		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	2.000	2.000	2.000	
		Mazdoor	day	50.000	50.000	50.000	
		b) Overhead charges		**@ on (a)**	**@ on (a)**	**@ on (a)**	
		c) Contractor's profit		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	
		Rate per 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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	6.000	6.000	6.000	
		Mazdoor	day	150.000	150.000	150.000	
		b) Machinery					
		Tractor-trolley	hour	122.222	122.222	122.222	
		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					
		Mate	day	8.000	8.000	8.000	
		Mazdoor	day	200.000	200.000	200.000	
		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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Dozer					
		(i) Dozer (240HP)	hour	5.952			
		(ii) Dozer (175 HP)	hour		7.692		
		(iii) Dozer (90 HP)	hour			13.889	
		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 18 cum capacity Tipper & 3.1 Cum capacity Loader	cum	1000.000			

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Dozer					
		(i) Dozer (240HP)	hour	7.440			
		(ii) Dozer (175 HP)	hour		9.615		
		(iii) Dozer (90 HP)	hour			17.361	
		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 18 cum capacity Tipper & 3.1 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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			b) Machinery					
			Motor Grader					
			(i) Motor grader 4.30 metre blade	hour	4.032			
			(ii) Motor grader 3.70 metre blade	hour		4.864		
			(iii) Motor grader 3.35 metre blade	hour			5.423	
			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 18 cum capacity Tipper & 3.1 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	0.040	0.040	0.040	
			Mazdoor	day	1.000	1.000	1.000	
			b) Machinery					
			Motor Grader					
			(i) Motor grader 4.30 metre blade	hour	5.040			
			(ii) Motor grader 3.70 metre blade	hour		6.080		
			(iii) Motor grader 3.35 metre blade	hour			6.779	
			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	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Loading & unloading charges for disposed of grabbed material					
		(i) Using by 18 cum capacity Tipper & 3.1 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					
		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	0.040	0.040	0.040	
		Mazdoor for dismantling and loading	day	1.000	1.000	1.000	
		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					

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
2.04		B	**Cement Concrete Grade M-15 & M-20**					
			a) Labour					
			Mate	day	0.050	0.050	0.050	
			Mazdoor for dismantling and loading	day	1.250	1.250	1.250	
			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	**Prestressed / Reinforced cement concrete grade M-20 & above**					
			a) Labour					
			Mate	day	0.150	0.150	0.150	
			Blacksmith	day	0.250	0.250	0.250	
			Mazdoor for dismantling, loading and unloading	day	3.500	3.500	3.500	
			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					
			a) Labour					
			Mate	day	0.020	0.020	0.020	
			Mazdoor for loading and unloading & Pneumatic breaker	day	0.500	0.500	0.500	
			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	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Loading & unloading charges for disposed of material					
		(i) Using by 18 cum capacity Tipper & 3.1 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**	**Prestressed / reinforced cement concrete grade M-20 & above**					
		Unit = Cum					
		Taking output = 1.25 cum					
		a) Labour					
		Mate	day	0.036	0.036	0.036	
		Mazdoor with Pneumatic breaker and for loading and unloading	day	0.910	0.910	0.910	
		Blacksmith	day	0.250	0.250	0.250	
		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 18 cum capacity Tipper & 3.1 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					

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
2.04		(ii)	**Dismantling Brick / Tile work**					
			By Manual Means					
		A	**In lime mortar**					
			a) Labour					
			Mate	day	0.020	0.020	0.020	
			Mazdoor for dismantling, loading and unloading	day	0.500	0.500	0.500	
			b) Machinery					
			Tractor-trolley	hour	0.257	0.257	0.257	
			c) Overhead charges @ on (a+b)					
			d) Contractor's profit @ 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	0.030	0.030	0.030	
			Mazdoor for dismantling, loading and unloading	day	0.750	0.750	0.750	
			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	0.016	0.016	0.016	
			Mazdoor for dismantling and loading	day	0.400	0.400	0.400	
			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		D	**Dry brick pitching or brick soling**					
			a) Labour					
			Mate	day	0.014	0.014	0.014	
			Mazdoor for Dismantling, loading and unloading	day	0.350	0.350	0.350	
			b) Machinery					
			Tractor-trolley	hour	0.257	0.257	0.257	

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 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	0.024	0.024	0.024	
		Mazdoor for dismantling, loading and unloading.	day	0.600	0.600	0.600	
		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	0.030	0.030	0.030	
		Mazdoor for dismantling, loading and unloading.	day	0.750	0.750	0.750	
		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	0.020	0.020	0.020	
		Mazdoor for dismantling, loading and unloading.	day	0.500	0.500	0.500	
		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					

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	0.018	0.018	0.018	
			Mazdoor for dismantling, loading and unloading.	day	0.450	0.450	0.450	
			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	0.016	0.016	0.016	
			Mazdoor for dismantling, loading and unloading.	day	0.400	0.400	0.400	
			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	0.020	0.020	0.020	
			Mazdoor for dismantling, loading and unloading	day	0.500	0.500	0.500	
			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					
		II	**By Mechanical Means**					
2.04		A	**Dismantling Brick / Tile work/ rubble masonary/ pitching/ etc. by mechanical means**					
			Unit = Cum					
			Taking output = 20 cum					

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	
		Mazdoor	day	0.200	0.200	0.200	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.523			
		(ii) 1.1 cum bucket capacity	hour		0.603		
		(iii) 0.9 cum bucket capacity	hour			0.843	
		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	0.523			
		(ii) 14 cum capacity	hour		0.603		
		(iii) 10 cum capacity	hour			0.843	
		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 20 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 20					
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	0.060	0.060	0.060	
		Carpenter	day	0.500	0.500	0.500	
		Mazdoor for dismantling, loading and unloading.	day	1.000	1.000	1.000	
		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					
	A	**Including dismembering**					
		a) Labour					
		Mate	day	0.140	0.140	0.140	

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Blacksmith	day	1.000	1.000	1.000	
			Mazdoor for dismantling, loading and unloading	day	2.500	2.500	2.500	
			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		**B**	**Excluding dismembering.**					
			a) Labour					
			Mate	day	0.100	0.100	0.100	
			Mazdoor for dismantling, loading and unloading	day	2.000	2.000	2.000	
			Blacksmith	day	0.500	0.500	0.500	
			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	0.010	0.010	0.010	
			Blacksmith	day	0.130	0.130	0.130	
			Mazdoor	day	0.130	0.130	0.130	
			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	0.140	0.140	0.140	
			Mazdoor	day	3.500	3.500	3.500	

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)**	
		Rate per 1000 Nos = a+b+c					
2.04	**B**	**In mud mortar**					
		a) Labour					
		Mate	day	0.050	0.050	0.050	
		Mazdoor	day	1.250	1.250	1.250	
		b) Overhead charges		**@ on (a)**	**@ on (a)**	**@ on (a)**	
		c) Contractor's profit		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	
		Rate per1000 Nos = a+b+c					
2.04	**(vii)**	**Scraping of Stone from Dismantled Stone Masonry**					
		Unit = cum					
		Taking output = 1 cum					
	A	**In cement and lime mortar**					
		a) Labour					
		Mate	day	0.056	0.056	0.056	
		Mazdoor	day	1.400	1.400	1.400	
		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	0.012	0.012	0.012	
		Mazdoor	day	0.300	0.300	0.300	
		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	0.160	0.160	0.160	
		Mazdoor for scarping and loading	day	4.000	4.000	4.000	
		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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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	0.084	0.094	0.105	
		Mazdoor	day	2.088	2.346	2.617	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	2.176			
		(ii) 1.1 cum bucket capacity	hour		2.693		
		(iii) 0.9 cum bucket capacity	hour			3.235	
		Tipper					
		For loading & Unloading Time & For transportation of excess material to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	hour	2.226			
		(ii) 14 cum capacity	hour		2.743		
		(iii) 10 cum capacity	hour			3.285	
		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	0.094	0.104	0.115	
		Mazdoor	day	2.338	2.596	2.867	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	2.676			
		(ii) 1.1 cum bucket capacity	hour		3.193		
		(iii) 0.9 cum bucket capacity	hour			3.735	
		Tipper for Loading & unloading					
		For loading & Unloading Time & For transportation of excess material to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	hour	2.726			
		(ii) 14 cum capacity	hour		3.243		
		(iii) 10 cum capacity	hour			3.785	

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 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	0.104	0.114	0.135	
		Mazdoor	day	2.588	2.846	3.367	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	3.176			
		(ii) 1.1 cum bucket capacity	hour		3.693		
		(iii) 0.9 cum bucket capacity	hour			4.735	
		Tipper for Loading & unloading For loading & Unloading Time & For transportation of excess material to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	hour	3.226			
		(ii) 14 cum capacity	hour		3.743		
		(iii) 10 cum capacity	hour			4.785	
		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	0.060	0.060	0.060	
		Mazdoor for dismantling, loading and unloading	day	1.500	1.500	1.500	

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			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	0.040	0.040	0.040	
			Mazdoor for dismantling, loading and unloading.	day	1.000	1.000	1.000	
			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	**202**		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	0.024	0.027	0.033	
			Mazdoor for dismantling, loading and unloading	day	0.588	0.667	0.833	
			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)**	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.029	0.033	0.046	
		Mazdoor for dismantling, loading and unloading	day	0.718	0.827	1.156	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	2.873			
		(ii) 1.1 cum bucket capacity	hour		3.308		
		(iii) 0.9 cum bucket capacity	hour			4.625	
		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)**	
		d) Contractor's profit		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ on (a+b+c)**	
		Rate for 250 metre = a+b+c+d					
		Rate per metre = (a+b+c+d)/250					
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	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	6.841			
		(ii) 1.1 cum bucket capacity	hour		8.048		
		(iii) 0.9 cum bucket capacity	hour			9.121	
		Jack Hammer	hour	6.841	9.146	12.162	
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1 cum per hour	hour	2.880	2.880	2.880	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 18 cum capacity Tipper & 3.1 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					
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	0.006	0.006	0.006	
		Mazdoor including loading and unloading	day	0.150	0.150	0.150	
		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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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	0.006	0.006	0.006	
		Mazdoor including loading and unloading	day	0.150	0.150	0.150	
		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	0.009	0.009	0.009	
		Mazdoor including loading and unloading	day	0.225	0.225	0.225	
		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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.030	0.030	0.030	
		Mazdoor	day	0.750	0.750	0.750	
		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	0.020	0.020	0.020	
		Mazdoor	day	0.500	0.500	0.500	
		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	0.004	0.004	0.004	
		Mazdoor	day	0.100	0.100	0.100	
		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					
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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.150	0.150	0.150	
		Mazdoor including loading and unloading	day	3.000	3.000	3.000	
		Blacksmith	day	0.750	0.750	0.750	
		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)**	
		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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		Plumber	day	0.250	0.250	0.250	
		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.					
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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		material separately but excluding earth excavation and dismantling of masonry works. **Unit = running metre** **Taking output = 10 metres**					
		a) Labour					
		Mate	day	0.100	0.100	0.100	
		Mazdoor	day	2.500	2.500	2.500	
		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	0.480	0.480	0.480	
		Mazdoor	day	10.000	10.000	10.000	
		Electrician/Lineman	day	2.000	2.000	2.000	
		b) Machinery					
		Tractor-trolley	hour	1.500	1.500	1.500	
		c) Overhead charges		**for large Project @ 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 area inaccessible to machines and for small jobs.

2 In 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 site 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 analysis, (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.

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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.01	301	**Excavation in Soil by Manual Means.** 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 upto 1000 metres. **Unit = cum** **Taking output = 120 cum**					
		a) Labour					
		Mate	day	1.800	1.800	1.800	
		Mazdoor	day	45.000	45.000	45.000	
		b) Machinery					
		Truck 5.5 cum capacity	hour	9.236	9.236	9.236	
		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 120 cum = a+b+c+d **Rate per cum = (a+b+c+d)/120**					
		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.					
3.02	301	**Excavation in Ordinary Rock by Manual Means** 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 **Unit = cum** **Taking output = 120 cum**					
		a) Labour					
		Mate	day	2.800	2.800	2.800	
		Mazdoor	day	70.000	70.000	70.000	
		b) Machinery					
		Truck 5.5 cum capacity	hour	9.236	9.236	9.236	
		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 120 cum = a+b+c+d **Rate per cum = (a+b+c+d)/120**					
		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.					
3.03	301	**Excavation in Soil with Dozer with lead upto 1000 metres** 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		requirements of lines, grades and cross sections. **Unit = cum** **Taking output = 500 cum**					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Dozer					
		Dozer (240HP)	hour	3.731			
		Dozer (175 HP)	hour		5.342		
		Dozer (90 HP)	hour			8.621	
		Tipper					
		(i) 18 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 18 cum capacity Tipper & 3.1 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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Dozer					
		Dozer (240HP)	hour	4.688			
		Dozer (175 HP)	hour		6.667		
		Dozer (90 HP)	hour			10.714	
		Tipper					
		For transportation considering lead @ 1km					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 18 cum capacity	t.km	720.000			
		(ii) 14 cum capacity	t.km		720.000		
		(iii) 10 cum capacity	t.km			720.000	
		or Loading & unloading charges					
		(i) Using by 18 cum capacity Tipper & 3.1 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 & 302**	**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	0.210	0.210	0.210	
		Mazdoor	day	3.000	3.000	3.000	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		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	3.375			
		Dozer (175 HP)	hour		4.800		
		Dozer (90 HP)	hour			7.714	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 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 18 cum capacity Tipper & 3.1 Cum capacity Loader	cum	216.000			
		(ii) Using by 14 cum capacity Tipper & 2.1 Cum capacity Loader	cum		216.000		

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 I 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+c)**	**@ on (a+b+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.					
3.06	**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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	3.926			
		(ii) 1.1 cum bucket capacity	hour		5.024		
		(iii) 0.9 cum bucket capacity	hour			6.321	
		Tipper					
		For transportation considering lead @ 1 km					
		(i) 18 cum capacity	t.km	525.000			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	t.km		525.000		
		(iii) 10 cum capacity	t.km			525.000	
		For loading & unloading time					
		(i) 18 cum capacity	hour	3.926			
		(ii) 14 cum capacity	hour		5.024		
		(iii) 10 cum capacity	hour			6.321	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator for Jack Hammer					
		(i) 1.2 cum bucket capacity	hour	6.982			
		(ii) 1.1 cum bucket capacity	hour		8.214		
		(iii) 0.9 cum bucket capacity	hour			8.727	
		Jack Hammer	hour	6.982	8.214	8.727	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 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 18 cum capacity Tipper & 3.1 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.08	301	**Excavation in Hard Rock (blasting prohibited)**					
		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 1000 m					
		A Mechanical Method					
		Unit = cum					
		Taking output = 50 cum					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator for Jack Hammer					
		(i) 1.2 cum bucket capacity	hour	8.533			
		(ii) 1.1 cum bucket capacity	hour		10.039		
		(iii) 0.9 cum bucket capacity	hour			11.378	
		Jack Hammer	hour	8.533	10.039	11.378	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 cum capacity	t.km	100.000			
		(ii) 14 cum capacity	t.km		100.000		
		(iii) 10 cum capacity	t.km			100.000	
		For loading & unloading charges for disposed of grabbed material					
		(i) Using by 18 cum capacity Tipper & 3.1 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	
		Credit for excavated rock found suitable for use @ 50 percent of excavated quantity	cum	25.000	25.000	25.000	
		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 50 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/50					
3.08		**B Manual Method**					
		Unit = cum					
		Taking output = 16 cum					
		a) Labour					
		Mate	day	1.640	1.640	1.640	
		Mazdoor including loading in truck	day	16.000	16.000	16.000	
		Chiseller	day	24.000	24.000	24.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Blacksmith (IInd class)	day	1.000	1.000	1.000	
		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 & 302**	**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	0.210	0.210	0.210	
		Mazdoor	day	3.000	3.000	3.000	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		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	3.375			
		Dozer (175 HP)	hour		4.320		
		Dozer (90 HP)	hour			7.714	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 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 18 cum capacity Tipper & 3.1 Cum capacity Loader	cum	216.000			
		(ii) Using by 14 cum capacity Tipper &	cum		216.000		

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		2.1 Cum capacity Loader					
		(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 I 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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	8.506			
		(ii) 1.1 cum bucket capacity	hour		9.796		
		(iii) 0.9 cum bucket capacity	hour			13.695	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 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) 18 cum capacity	hour	8.506			
		(ii) 14 cum capacity	hour		9.796		
		(iii) 10 cum capacity	hour			13.695	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.769			
		(ii) 1.1 cum bucket capacity	hour		5.492		
		(iii) 0.9 cum bucket capacity	hour			7.678	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 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) 18 cum capacity	hour	4.769			
		(ii) 14 cum capacity	hour		5.492		
		(iii) 10 cum capacity	hour			7.678	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.12	303	**Presplitting of Rock Excavation Slopes** 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 = Sqm** **Taking output = 400 sqm** ***(120 cum considering 300 mm average depth of excavation over the existing rock face)***					
		a) Labour					
		Mate	day	0.210	0.210	0.210	
		Mazdoor	day	3.000	3.000	3.000	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		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	
		Dozer					
		(i) Dozer (240HP)	hour	1.875			
		(ii) Dozer (175 HP)	hour		2.400		
		(iii) Dozer (90 HP)	hour			4.286	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 cum capacity	t.km	240.000			
		(ii) 14 cum capacity	t.km		240.000		
		(iii) 10 cum capacity	t.km			240.000	
		For Loading & unloading charges					
		(i) Using by 18 cum capacity Tipper & 3.1 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	
		c) Materials					
		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 hole for I cum)	no	7.000	7.000	7.000	
		Detonating fuse coil	m	213.000	213.000	213.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		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 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	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation & Backfill					
		(i) 1.2 cum bucket capacity	hour	4.627			
		(ii) 1.1 cum bucket capacity	hour		5.329		
		(iii) 0.9 cum bucket capacity	hour			7.450	

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) 18 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) 18 cum capacity	hour	1.851			
		(ii) 14 cum capacity	hour		2.131		
		(iii) 10 cum capacity	hour			2.980	
		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)					
		Unit = cum					
		Taking output = 10 cum					
		a) Labour					
		Mate	day	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		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**					
		Unit = cum					
		Taking output = 50 cum					
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation , backfilling & loading					
		(i) 1.2 cum bucket capacity	hour	7.127			
		(ii) 1.1 cum bucket capacity	hour		8.352		
		(iii) 0.9 cum bucket capacity	hour			9.380	
		Jack Hammer	hour	5.818	6.845	7.273	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	40.000			
		(ii) 14 cum capacity	t.km		40.000		
		(iii) 10 cum capacity	t.km			40.000	

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	0.523			
		(ii) 14 cum capacity	hour		0.603		
		(iii) 10 cum capacity	hour			0.843	
		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	302& 303	**(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	0.210	0.210	0.210	
		Mazdoor	day	3.000	3.000	3.000	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		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	3.537			
		(ii) 1.1 cum bucket capacity	hour		4.174		
		(iii) 0.9 cum bucket capacity	hour			5.411	
		Jack Hammer (consider 5% of the volume for dressing)	hour	1.024	1.280	1.365	
		Tipper					
		For transportation considering lead @ 1km					
		(i) 18 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) 18 cum capacity	hour	1.005			
		(ii) 14 cum capacity	hour		1.157		
		(iii) 10 cum capacity	hour			1.618	

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 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					
3.13	**(iv)**	**Hard Rock (blasting prohibited)**					
		Unit = cum					
		Taking output = 35 cum					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Hydraulic Excavator used for Jack hammer & loading					
		(i) 1.2 cum bucket capacity	hour	9.571			
		(ii) 1.1 cum bucket capacity	hour		11.244		
		(iii) 0.9 cum bucket capacity	hour			13.783	
		Jack Hammer	hour	8.960	10.541	12.800	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 cum capacity	t.km	28.000			
		(ii) 14 cum capacity	t.km		28.000		
		(iii) 10 cum capacity	t.km			28.000	
		For loading & unloading					
		(i) 18 cum capacity	hour	0.244			
		(ii) 14 cum capacity	hour		0.281		
		(iii) 10 cum capacity	hour			0.393	
		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					

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	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		b) Machinery					
		Tractor-trolley	hour	2.670	2.670	2.670	
		c) Material					
		Selected earth for refilling	cum	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)**	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	10.256			
		(ii) 1.1 cum bucket capacity	hour		11.811		
		(iii) 0.9 cum bucket capacity	hour			16.513	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 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) 18 cum capacity	hour	10.256			
		(ii) 14 cum capacity	hour		11.811		
		(iii) 10 cum capacity	hour			16.513	
		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					

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	0.200	0.200	0.200	
		Mazdoor including loading and unloading	day	5.000	5.000	5.000	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.309			
		(ii) 1.1 cum bucket capacity	hour		4.962		
		(iii) 0.9 cum bucket capacity	hour			6.938	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 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) 18 cum capacity	hour	4.309			
		(ii) 14 cum capacity	hour		4.962		
		(iii) 10 cum capacity	hour			6.938	
		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					

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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	3.064			
		(ii) Motor grader 3.70 metre blade	hour		3.676		
		(iii) Motor grader 3.35 metre blade	hour			3.720	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 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 18 cum capacity Tipper & 3.1 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					

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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.196			
		(ii) 1.1 cum bucket capacity	hour		5.984		
		(iii) 0.9 cum bucket capacity	hour			8.366	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 18 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) 18 cum capacity	hour	5.196			
		(ii) 14 cum capacity	hour		5.984		
		(iii) 10 cum capacity	hour			8.366	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	3.064			
		(ii) Motor grader 3.70 metre blade	hour		3.676		
		(iii) Motor grader 3.35 metre blade	hour			3.720	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 18 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 18 cum capacity Tipper & 3.1 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.**					
		Unit = cum					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 450 cum					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	5.048			
		(ii) 1.1 cum bucket capacity	hour		5.813		
		(iii) 0.9 cum bucket capacity	hour			8.127	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	5.048			
		(ii) 14 cum capacity	hour		5.813		
		(iii) 10 cum capacity	hour			8.127	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.177			
		(ii) Motor grader 3.70 metre blade	hour		2.626		
		(iii) Motor grader 3.35 metre blade	hour			2.929	
		Water tanker (speed @ Water tanker speed km/ hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.864			
		(ii) 12 KL capacity	hour		0.333 x L1 + 1.152		
		(iii) 6 KL capacity	hour			0.667 x L1 + 2.304	
		Vibratory roller	hour	2.184	2.184	2.184	
		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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.17	**305**	**Construction of Embankment 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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.177			
		(ii) Motor grader 3.70 metre blade	hour		2.626		
		(iii) Motor grader 3.35 metre blade	hour			2.929	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.864			
		(ii) 12 KL capacity	hour		0.333 x L1 + 1.152		
		(iii) 6 KL capacity	hour			0.667 x L1 + 2.304	
		Vibratory roller	hour	2.184	2.184	2.184	
		c) Material					
		Cost of water (considering 5% additional moisture required)	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)**	
		Cost for 450 cum = a+b+c+d+e **Rate per cum = (a+b+c+d+e)/450**					
3.18	**305**	**Construction of Subgrade and Earthen Shoulders** 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** **Unit = cum** **Taking output = 450 cum**					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	

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	5.048			
		(ii) 1.1 cum bucket capacity	hour		5.813		
		(iii) 0.9 cum bucket capacity	hour			8.127	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	5.048			
		(ii) 14 cum capacity	hour		5.813		
		(iii) 10 cum capacity	hour			8.127	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.177			
		(ii) Motor grader 3.70 metre blade	hour		2.626		
		(iii) Motor grader 3.35 metre blade	hour			2.929	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.273 x L1 + 0.945			
		(ii) 12 KL capacity	hour		0.365 x L1 + 1.26		
		(iii) 6 KL capacity	hour			0.729 x L1 + 2.52	
		Vibratory roller 12 tonne	hour	2.184	2.184	2.184	
		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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.177			
		(ii) Motor grader 3.70 metre blade	hour		2.626		
		(iii) Motor grader 3.35 metre blade	hour			2.929	
		Water tanker (speed @ Water tanker speed km/ hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.273 x L1 + 0.945			
		(ii) 12 KL capacity	hour		0.365 x L1 + 1.26		
		(iii) 6 KL capacity	hour			0.729 x L1 + 2.52	
		Vibratory roller	hour	2.184	2.184	2.184	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor grader for ripping (in two layers) & grading					
		(i) Motor grader 4.30 metre blade	hour	2.192			
		(ii) Motor grader 3.70 metre blade	hour		2.637		
		(iii) Motor grader 3.35 metre blade	hour			2.804	
		Water tanker (speed @ Water tanker speed km/ hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.137 x L1 + 0.236			
		(ii) 12 KL capacity	hour		0.182 x L1 + 0.315		
		(iii) 6 KL capacity	hour			0.365 x L1 + 0.63	
		Vibratory roller	hour	1.092	1.092	1.092	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor grader for ripping & grading					
		(i) Motor grader 4.30 metre blade	hour	3.487			
		(ii) Motor grader 3.70 metre blade	hour		4.197		
		(iii) Motor grader 3.35 metre blade	hour			4.497	
		Water tanker (speed @ Water tanker speed km/ hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.167 x L1 + 0.64			
		(ii) 12 KL capacity	hour		0.222 x L1 + 0.853		
		(iii) 6 KL capacity	hour			0.444 x L1 + 1.707	
		Vibratory roller	hour	1.456	1.456	1.456	
		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)**	

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 300 cum = a+b+c+d+e **Rate per cum = (a+b+c+d+e)/300**					
3.21	**305**	**Stripping and Storing Top Soil** Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth. **Unit = cum** **Taking output = 250 cum**					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor grader					
		(i) Motor grader 4.30 metre blade	hour	1.680			
		(ii) Motor grader 3.70 metre blade	hour		2.027		
		(iii) Motor grader 3.35 metre blade	hour			2.260	
		Hydraulic Excavator for reapplication					
		(i) 1.2 cum bucket capacity	hour	2.804			
		(ii) 1.1 cum bucket capacity	hour		3.230		
		(iii) 0.9 cum bucket capacity	hour			4.515	
		Tipper					
		For transportation considering lead @ 1 km (20% of the material needs to be transported)					
		(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 (20% of the material needs to be transported)					
		(i) Using by 18 cum capacity Tipper & 3.1 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	
		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**					
3.22	**305**	**Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields.** Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after					

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer.					
			Unit = cum					
			Taking output = 250 cum					
			a) Labour					
			Mate	day	0.040	0.040	0.040	
			Mazdoor	day	1.000	1.000	1.000	
			b) Machinery					
			Motor grader					
			(i) Motor grader 4.30 metre blade	hour	1.680			
			(ii) Motor grader 3.70 metre blade	hour		2.027		
			(iii) Motor grader 3.35 metre blade	hour			2.260	
			Hydraulic Excavator for reapplication					
			(i) 1.2 cum bucket capacity	hour	2.804			
			(ii) 1.1 cum bucket capacity	hour		3.230		
			(iii) 0.9 cum bucket capacity	hour			4.515	
			Tipper					
			For transportation					
			(i) 18 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 18 cum capacity Tipper & 3.1 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, fetc.hing of sods and watering.					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.120	0.120	0.120	
			Mazdoor for preparation of ground and fetc.hing of sods	day	3.000	3.000	3.000	

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 @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.5 x L1 + 0.096			
		(ii) 12 KL capacity	hour		0.667 x L1 + 0.128		
		(iii) 6 KL capacity	hour			1.333 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	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		b) Machinery					
		Water tanker including watering for 3 months					
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	3.5 x L1 + 1.613			
		(ii) 12 KL capacity	hour		4.667 x L1 + 2.15		
		(iii) 6 KL capacity	hour			9.333 x L1 + 4.301	
		Tractor-trolley	hour	2.400	2.400	2.400	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	
		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 metre					
	A	**Mechanical means**					
		a) Labour					
		Mate	day	0.010	0.010	0.010	
		Mazdoor for dressing of bed and side of drain	day	0.250	0.250	0.250	
		b) Machinery					
		Hydraulic Excavator 0.9 cum bucket capacity	hour	0.090	0.090	0.090	
		Tractor-trolley					
		Tractor-trolley for transportation & for loading & Unloading Time	hour	0.246	0.246	0.246	
		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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		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)**	

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 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.					
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 metre					
		A Mechanical Means					
		a) Labour					
		Mate	day	0.020	0.020	0.020	
		Mazdoor for dressing of bed and side of drain	day	0.500	0.500	0.500	
		b) Machinery					
		Hydraulic Excavator 0.9 cum bucket capacity	hour	0.112	0.112	0.112	
		Tractor-trolley					
		Tractor-trolley for transportation & for loading & Unloading Time	hour	0.267	0.267	0.267	
		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	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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					
		Rate per metre = (a+b+c)/10					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 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 metre**					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor for excavation and back filling	day	2.000	2.000	2.000	
		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)**	**@ on (a+b)**	
		d) Contractor's profit @ on (a+b+c)		**@ 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 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 metre**					
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mazdoor for excavation and back filling with aggregates	day	1.500	1.500	1.500	
		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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 Case-II including OH & CP)	cum	0.495	0.495	0.495	
		c) Reinforcement (Rate taken from Item No. - 9.07 including OH & CP)	tonne	0.020	0.020	0.020	
		Rate per metre = (a+b+c) 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	0.280	0.280	0.280	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	1.000	1.000	1.000	
		b) Machinery					
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.125 x L1 + 0.84			
		(ii) 12 KL capacity	hour		0.167 x L1 + 1.12		
		(iii) 6 KL capacity	hour			0.333 x L1 + 2.24	
		Vibratory roller	hour	2.549	2.549	2.549	
		c) Material					
		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)**	

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 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 granular material, rolled with vibratory road roller, all complete as per clause 313.					
		Unit = cum					
		Taking output = 500 cum					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Dozer					
		Dozer (240HP)	hour	3.731			
		Dozer (175 HP)	hour		4.808		
		Dozer (90 HP)	hour			8.621	
		Tipper for transportation of rock considering lead @ 5 km					
		(i) 18 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 @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.111 x L1 + 0.427			
		(ii) 12 KL capacity	hour		0.148 x L1 + 0.569		
		(iii) 6 KL capacity	hour			0.296 x L1 + 1.138	
		Vibratory roller	hour	2.427	2.427	2.427	
		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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
3.33		**Work in Urban Roads** The cost of earth work in urban roads inhabited area will be comparatively higher due to following reasons: a) 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 b) There is considerable disruption of traffic adversely affecting the efficiency of the working parties including machines due to congestion caused by pedestrian traffic, local road side venders, 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 Fly ash/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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		b) Machinery					
		Hydraulic Excavator					
		For borrow area soil					
		(i) 1.2 cum bucket capacity	hour	0.757			
		(ii) 1.1 cum bucket capacity	hour		0.872		
		(iii) 0.9 cum bucket capacity	hour			1.219	
		Tipper					
		Transportation of borrow area soil					
		(i) 18 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 Fly ash					
		To be supplied by the Thermal Power Plant including loading and unloading					
		Loading & unloading					
		(i) 18 cum capacity	hour	0.757			
		(ii) 14 cum capacity	hour		0.872		
		(iii) 10 cum capacity	hour			1.219	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.177			
		(ii) Motor grader 3.70 metre blade	hour		2.626		
		(iii) Motor grader 3.35 metre blade	hour			2.929	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.356 x L1 + 1.231			
		(ii) 12 KL capacity	hour		0.475 x L1 + 1.642		
		(iii) 6 KL capacity	hour			0.95 x L1 + 3.283	
		Vibratory roller 12 tonne	hour	2.184	2.184	2.184	
		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
1. As Fly ash is available free of cost as waste material from Thermal Plants, cost of material has notbeen added.
2. 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 aggregate 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.

Sr No	Ref. 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 close graded 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	0.080	0.080	0.080	
		Mazdoor skilled	day	1.000	1.000	1.000	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	4.480			
		(ii) 200 tonne per hour	hour		5.600		
		(iii) 100 tonne per hour	hour			11.200	
		Electric generator					
		(i) 125 KVA	hour	4.480			
		(ii) 100 KVA	hour		5.600		
		(iii) 62.5 KVA	hour			11.200	
		Front end loader					
		(i) 3.1 Cum Capacity	hour	9.502			
		(ii) 2.1 Cum Capacity	hour		14.047		
		(iii) 1 Cum Capacity	hour			29.371	
		Tipper					
		For transportation					
		(i) 18 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) 18 cum capacity	hour	4.480			
		(ii) 14 cum capacity	hour		5.600		
		(iii) 10 cum capacity	hour			11.200	
		Motor grader					
		(i) Motor grader 4.30 metre blade	hour	3.226			
		(ii) Motor grader 3.70 metre blade	hour		3.891		
		(iii) Motor grader 3.35 metre blade	hour			4.339	
		Vibratory roller	hour	2.589	2.589	2.589	
		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	
		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	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			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 percent	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 percent	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 (a+b+c)**	**@ on (a+b+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		**(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 400 cum = a+b+c+d+e					
			Rate per cum = (a+b+c+d+e)/400					

Sr No	Ref. 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	401	B	**By Mix in Place Method**					
			Construction of granular sub-base by providing close graded 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	0.160	0.160	0.160	
			Mazdoor skilled	day	1.000	1.000	1.000	
			Mazdoor	day	3.000	3.000	3.000	
			b) Machinery					
			Front end loader for mixing at stock pile location					
			(i) 3.1 Cum Capacity	hour	4.464			
			(ii) 2.1 Cum Capacity	hour		6.579		

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 1 Cum Capacity	hour			13.889	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.292 x L1 + 0.778			
		(ii) 12 KL capacity	hour		0.389 x L1 + 1.037		
		(iii) 6 KL capacity	hour			0.778 x L1 + 2.074	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.016			
		(ii) Motor grader 3.70 metre blade	hour		2.432		
		(iii) Motor grader 3.35 metre blade	hour			2.712	
		Vibratory roller	hour	1.618	1.618	1.618	
		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 percent	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 percent	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 percent	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 percent	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	

Sr No	Ref. 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 percent	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					

Sr No	Ref. 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	0.080	0.080	0.080	
			Mazdoor skilled	day	1.000	1.000	1.000	
			Mazdoor	day	1.000	1.000	1.000	
			b) Machinery					
			Front end loader for loading to Tipper					
			(i) 3.1 Cum Capacity	hour	1.548			
			(ii) 2.1 Cum Capacity	hour		2.283		
			(iii) 1 Cum Capacity	hour			4.808	
			Tipper					
			For transportation					
			(i) 18 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) 18 cum capacity	hour	1.548			
			(ii) 14 cum capacity	hour		2.283		
			(iii) 10 cum capacity	hour			4.808	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
			(i) 16 KL capacity	hour	0.292 x L1 + 0.778			
			(ii) 12 KL capacity	hour		0.389 x L1 + 1.037		
			(iii) 6 KL capacity	hour			0.778 x L1 + 2.074	
			Motor Grader					
			(i) Motor grader 4.30 metre blade	hour	2.016			
			(ii) Motor grader 3.70 metre blade	hour		2.432		
			(iii) Motor grader 3.35 metre blade	hour			2.712	
			Vibratory roller	hour	1.618	1.618	1.618	
			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	

Sr No	Ref. 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					
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)**	

Sr No	Ref. 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 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	0.360	0.360	0.360	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	3.365			
		(ii) 1.1 cum bucket capacity	hour		3.875		
		(iii) 0.9 cum bucket capacity	hour			5.418	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	3.365			
		(ii) 14 cum capacity	hour		3.875		
		(iii) 10 cum capacity	hour			5.418	
		Tractor with ripper and rotavator attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Motor Grader					
			(i) Motor grader 4.30 metre blade	hour	2.419			
			(ii) Motor grader 3.70 metre blade	hour		2.918		
			(iii) Motor grader 3.35 metre blade	hour			3.254	
			Vibratory roller	hour	1.456	1.456	1.456	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
			(i) 16 KL capacity	hour	0.693 x L1 + 2.217			
			(ii) 12 KL capacity	hour		0.924 x L1 + 2.956		
			(iii) 6 KL capacity	hour			1.847 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	0.080	0.080	0.080	
			Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor	day	1.000	1.000	1.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	3.365			
		(ii) 14 cum capacity	hour		3.875		
		(iii) 10 cum capacity	hour			5.418	
		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	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.693 x L1 + 2.217			
		(ii) 12 KL capacity	hour		0.924 x L1 + 2.956		
		(iii) 6 KL capacity	hour			1.847 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 **manually spread** 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**					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		By Mechanical Means					
		a) Labour					
		Mate	day	0.360	0.360	0.360	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	3.365			
		(ii) 1.1 cum bucket capacity	hour		3.875		
		(iii) 0.9 cum bucket capacity	hour			5.418	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	3.365			
		(ii) 14 cum capacity	hour		3.875		
		(iii) 10 cum capacity	hour			5.418	
		Soil Stabilizer for mixing and pulverising with capacity 1000 m^2 per hour	hour	2.667	2.667	2.667	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.693 x L1 + 2.217			
		(ii) 12 KL capacity	hour		0.924 x L1 + 2.956		
		(iii) 6 KL capacity	hour			1.847 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					

Sr No	Ref. 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	0.360	0.360	0.360	
			Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor for spraying lime	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	3.365			
			(ii) 14 cum capacity	hour		3.875		
			(iii) 10 cum capacity	hour			5.418	
			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	2.419			
			(ii) Motor grader 3.70 metre blade	hour		2.918		
			(iii) Motor grader 3.35 metre blade	hour			3.254	
			Vibratory roller	hour	1.456	1.456	1.456	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
			(i) 16 KL capacity	hour	0.693 x L1 + 2.217			
			(ii) 12 KL capacity	hour		0.924 x L1 + 2.956		
			(iii) 6 KL capacity	hour			1.847 x L1 + 5.911	
			c) Material					
			Cement at site	tonne	10.500	10.500	10.500	

Sr No	Ref. 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	0.080	0.080	0.080	
			Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor for spraying lime	day	1.000	1.000	1.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	3.365			
			(ii) 14 cum capacity	hour		3.875		
			(iii) 10 cum capacity	hour			5.418	
			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	2.419			
			(ii) Motor grader 3.70 metre blade	hour		2.918		
			(iii) Motor grader 3.35 metre blade	hour			3.254	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Vibratory roller	hour	1.456	1.456	1.456	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
			(i) 16 KL capacity	hour	0.693 x L1 + 2.217			
			(ii) 12 KL capacity	hour		0.924 x L1 + 2.956		
			(iii) 6 KL capacity	hour			1.847 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 spread,** 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	0.360	0.360	0.360	
			Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor for spraying lime	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	3.365			

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		3.875		
		(iii) 10 cum capacity	hour			5.418	
		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	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.693 x L1 + 2.217			
		(ii) 12 KL capacity	hour		0.924 x L1 + 2.956		
		(iii) 6 KL capacity	hour			1.847 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	0.360	0.360	0.360	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	8.000	8.000	8.000	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	3.365			
			(ii) 14 cum capacity	hour		3.875		
			(iii) 10 cum capacity	hour			5.418	
			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	2.419			
			(ii) Motor grader 3.70 metre blade	hour		2.918		
			(iii) Motor grader 3.35 metre blade	hour			3.254	
			Vibratory roller	hour	1.456	1.456	1.456	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
			(i) 16 KL capacity	hour	0.594 x L1 + 1.9			
			(ii) 12 KL capacity	hour		0.792 x L1 + 2.533		
			(iii) 6 KL capacity	hour			1.583 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					

Sr No	Ref. 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	0.080	0.080	0.080	
		Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
		Mazdoor for spraying lime	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	3.365			
		(ii) 1.1 cum bucket capacity	hour		3.875		
		(iii) 0.9 cum bucket capacity	hour			5.418	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	3.365			
		(ii) 14 cum capacity	hour		3.875		
		(iii) 10 cum capacity	hour			5.418	
		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	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.594 x L1 + 1.9			
		(ii) 12 KL capacity	hour		0.792 x L1 + 2.533		
		(iii) 6 KL capacity	hour			1.583 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**					

Sr No	Ref. 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 **spread 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	0.360	0.360	0.360	
			Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor for spraying lime	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	3.365			
			(ii) 14 cum capacity	hour		3.875		
			(iii) 10 cum capacity	hour			5.418	
			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	2.419			
			(ii) Motor grader 3.70 metre blade	hour		2.918		
			(iii) Motor grader 3.35 metre blade	hour			3.254	
			Vibratory roller	hour	1.456	1.456	1.456	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
			(i) 16 KL capacity	hour	0.594 x L1 + 1.900			
			(ii) 12 KL capacity	hour		0.792 x L1 + 2.533		
			(iii) 6 KL capacity	hour			1.583 x L1 + 5.067	
			c) Material					
			Lime at site	tonne	9.000	9.000	9.000	

Sr No	Ref. 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	0.080	0.080	0.080	
			SkVilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor for spraying lime	day	1.000	1.000	1.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	3.365			
			(ii) 14 cum capacity	hour		3.875		
			(iii) 10 cum capacity	hour			5.418	
			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	2.419			
			(ii) Motor grader 3.70 metre blade	hour		2.918		
			(iii) Motor grader 3.35 metre blade	hour			3.254	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Vibratory roller	hour	1.456	1.456	1.456	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
			(i) 16 KL capacity	hour	0.594 x L1 + 1.9			
			(ii) 12 KL capacity	hour		0.792 x L1 + 2.533		
			(iii) 6 KL capacity	hour			1.583 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 spread**, 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	0.360	0.360	0.360	
			Skilled mazdoor for alignment and geometrics	day	1.000	1.000	1.000	
			Mazdoor for spraying lime	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			(i) 1.2 cum bucket capacity	hour	3.365			
			(ii) 1.1 cum bucket capacity	hour		3.875		
			(iii) 0.9 cum bucket capacity	hour			5.418	
			Tipper					
			For Transportation					
			(i) 18 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					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 18 cum capacity	hour	3.365			
		(ii) 14 cum capacity	hour		3.875		
		(iii) 10 cum capacity	hour			5.418	
		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	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.594 x L1 + 1.900			
		(ii) 12 KL capacity	hour		0.792 x L1 + 2.533		
		(iii) 6 KL capacity	hour			1.583 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	0.480	0.480	0.480	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	10.000	10.000	10.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	7.852			

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		9.043		
		(iii) 0.9 cum bucket capacity	hour			12.642	
		Tipper					
		For Transportation of Soil					
		(i) 18 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) 18 cum capacity	hour	7.852			
		(ii) 14 cum capacity	hour		9.043		
		(iii) 10 cum capacity	hour			12.642	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Tractor with ripper and rotavator attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.365 x L1 + 1.167			
		(ii) 12 KL capacity	hour		0.486 x L1 + 1.556		
		(iii) 6 KL capacity	hour			0.972 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					

Sr No	Ref. 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	0.480	0.480	0.480	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	10.000	10.000	10.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	7.852			
		(ii) 1.1 cum bucket capacity	hour		9.043		
		(iii) 0.9 cum bucket capacity	hour			12.642	
		Tipper					
		For Transportation of Soil					
		(i) 18 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) 18 cum capacity	hour	7.852			
		(ii) 14 cum capacity	hour		9.043		
		(iii) 10 cum capacity	hour			12.642	
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Tractor with ripper and rotavator attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.365 x L1 + 1.167			
		(ii) 12 KL capacity	hour		0.486 x L1 + 1.556		
		(iii) 6 KL capacity	hour			0.972 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					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
4.07	403	**Cement Treated Crushed Rock or combination as per clause 403 and Table 400-4 in Sub base/ Base** 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. **Unit = cum** **Taking output = 300 cum** **Quantity of cement assumed as 4 percent of quantity of crushed rock by weight.**					
		a) Labour					
		Mate	day	0.480	0.480	0.480	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	10.000	10.000	10.000	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.419			
		(ii) Motor grader 3.70 metre blade	hour		2.918		
		(iii) Motor grader 3.35 metre blade	hour			3.254	
		Vibratory roller	hour	1.456	1.456	1.456	
		Tractor with ripper and rotavator attachments @ 250 cum per hour for mixing	hour	1.200	1.200	1.200	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.417 x L1 + 1.333			
		(ii) 12 KL capacity	hour		0.556 x L1 + 1.778		
		(iii) 6 KL capacity	hour			1.111 x L1 + 3.556	
		c) Material					
		Cement at site @ 4 percent by weight of crushed aggregate (600 tonne)	tonne	24.000	24.000	24.000	
		Grading of material for sub-base course					
		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	
		or					
		Grading of material for Base course					
		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	

Sr No	Ref. 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 aggregate provided under 'c' above are uncompacted quantities.					
4.08	403	A	**Cement Treated Crushed Stone Sub base**					
			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	0.160	0.160	0.160	
			Mazdoor skilled	day	1.000	1.000	1.000	
			Mazdoor	day	3.000	3.000	3.000	
			b) Machinery					
			Wet mix plant					
			(i) 250 tonne per hour	hour	2.800			
			(ii) 200 tonne per hour	hour		3.500		
			(iii) 100 tonne per hour	hour			7.000	
			Electric generator					
			(i) 125 KVA	hour	2.800			
			(ii) 100 KVA	hour		3.500		
			(iii) 62.5 KVA	hour			7.000	
			Front end loader for loading to Tipper					
			(i) 3.1 Cum Capacity	hour	5.939			
			(ii) 2.1 Cum Capacity	hour		8.779		
			(iii) 1 Cum Capacity	hour			18.357	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	5.600			

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		6.300		
		(iii) 10 cum capacity	hour			9.800	
		Mechanical Paver finisher	hour	2.800	3.500	3.500	
		Vibratory roller	hour	2.240	2.800	2.800	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.328 x L1 + 0.875			
		(ii) 12 KL capacity	hour		0.4375 x L1 + 1.167		
		(iii) 6 KL capacity	hour			0.875 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 percent	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 percent	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)/hour					
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					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		By Mechanical Means					
		a) Labour					
		Mate	day	0.400	0.400	0.400	
		Skilled mazdoor for alignment and geometrics	day	2.000	2.000	2.000	
		Mazdoor for spraying lime	day	8.000	8.000	8.000	
		b) Machinery					
		Front end loader for mixing at stock pile location					
		(i) 3.1 Cum Capacity	hour	4.464			
		(ii) 2.1 Cum Capacity	hour		6.579		
		(iii) 1 Cum Capacity	hour			13.889	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.693 x L1 + 1.847			
		(ii) 12 KL capacity	hour		0.924 x L1 + 2.463		
		(iii) 6 KL capacity	hour			1.847 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	2.016			
		(ii) Motor grader 3.70 metre blade	hour		2.432		
		(iii) Motor grader 3.35 metre blade	hour			2.712	
		Vibratory roller	hour	1.618	1.618	1.618	
		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 percent	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 percent	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)					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost for day cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/250					
4.09	404.3.1	**Making 50 mm x 50 mm Furrows**					
		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					
		Unit = sqm					
		Taking output = 30 m x 7 m = 210 sqm					
		(i) 25mm deep furrow cutting					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Tractor-trolley	hour	0.200	0.200	0.200	
		c) Overhead charges @ on (a+b)					
		d) Contractor's profit @ on (a+b+c)					
		Cost for 210 sqm= a+b+c+d					
		Rate per sqm =(a+b+c+d)/210					
		(ii) 50mm deep furrow cutting					
		a) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	4.000	4.000	4.000	
		b) Machinery					
		Tractor-trolley	hour	0.400	0.400	0.400	
		c) Overhead charges @ on (a+b)					
		d) Contractor's profit @ on (a+b+c)					
		Cost for 210 sqm= a+b+c+d					
		Rate per sqm =(a+b+c+d)/210					
4.10	404.3.2	**Inverted Choke**					
		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.					
		Unit = cum					
		Taking output = 600 cum					
		a) Labour					
		Mate	day	0.920	0.920	0.920	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	21.000	21.000	21.000	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	4.839			
		(ii) Motor grader 3.70 metre blade	hour		5.837		
		(iii) Motor grader 3.35 metre blade	hour			6.508	

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Vibratory roller 8-10 tonnes @ 60 cum per hour	hour	6.000	6.000	6.000	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.75 x L1 + 4.8			
		(ii) 12 KL capacity	hour		1 x L1 + 6.4		
		(iii) 6 KL capacity	hour			2 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	10.080	10.080	10.080	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	250.000	250.000	250.000	
		b) Machinery					
		Vibratory roller	hour	2.330	2.330	2.330	
		or					
		Smooth 3 wheeled steel roller @ 30cum/hour	hour	4.660	4.660	4.660	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	1 x L1 + 3.84			
		(ii) 12 KL capacity	hour		1.333 x L1 + 5.12		
		(iii) 6 KL capacity	hour			0.533 x L1 + 10.24	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			c) Material (Refer table 400 – 8,9, 10 & 11)					
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 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 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	

Sr No	Ref. 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	0.680	0.680	0.680	
			Mazdoor skilled	day	2.000	2.000	2.000	
			Mazdoor	day	15.000	15.000	15.000	
			b) Machinery					
			Front end loader for mixing at stock pile location					
			(i) 3.1 Cum Capacity	hour	6.429			
			(ii) 2.1 Cum Capacity	hour		9.474		
			(iii) 1 Cum Capacity	hour			20.000	
			Motor Grader					
			(i) Motor grader 4.30 metre blade	hour	2.903			
			(ii) Motor grader 3.70 metre blade	hour		3.502		
			(iii) Motor grader 3.35 metre blade	hour			3.905	
			Vibratory roller	hour	2.330	2.330	2.330	
			or					
			Smooth 3 wheeled steel roller	hour	4.660	4.660	4.660	

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
			(i) 16 KL capacity	hour	1 x L1 + 3.84			
			(ii) 12 KL capacity	hour		1.333 x L1 + 5.12		
			(iii) 6 KL capacity	hour			2.667 x L1 + 10.24	
			c) Material (Refer table 400 -8, 9, 10 & 11)					
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 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 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 (i)		(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					

Sr No	Ref. M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
4.11 B (i)		(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 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 B (ii)		(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-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**					
4.12	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,					

Sr No	Ref. 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	4.160	4.160	4.160	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	102.000	102.000	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.903			
		(ii) Motor grader 3.70 metre blade	hour		3.502		
		(iii) Motor grader 3.35 metre blade	hour			3.905	
		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	2.229			
		(ii) 2.1 Cum Capacity	hour		3.288		
		(iii) 1 Cum Capacity	hour			6.923	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	2.229			
		(ii) 14 cum capacity	hour		3.288		
		(iii) 10 cum capacity	hour			6.923	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.4 x L1 + 1.536			
		(ii) 12 KL capacity	hour		0.533 x L1 + 2.048		
		(iii) 6 KL capacity	hour			1.067 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	

Sr No	Ref. 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	0.560	0.560	0.560	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	12.000	12.000	12.000	
		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**					

Sr No	Ref. 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	0.160	0.160	0.160	
			Mazdoor skilled	day	1.000	1.000	1.000	
			Mazdoor	day	3.000	3.000	3.000	
			b) Machinery					
			Wet mix plant					
			(i) 250 tonne per hour	hour	2.640			
			(ii) 200 tonne per hour	hour		3.300		
			(iii) 100 tonne per hour	hour			6.600	
			Electric generator					
			(i) 125 KVA	hour	2.640			
			(ii) 100 KVA	hour		3.300		
			(iii) 62.5 KVA	hour			6.600	
			Front end loader for loading to Tipper					
			(i) 3.1 Cum Capacity	hour	2.640			
			(ii) 2.1 Cum Capacity	hour		3.300		
			(iii) 1 Cum Capacity	hour			6.600	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	5.280			
			(ii) 14 cum capacity	hour		6.600		
			(iii) 10 cum capacity	hour			9.900	
			Mechanical Paver finisher	hour	2.640	3.300	3.300	
			Vibratory roller	hour	2.112	2.640	2.640	
			c) Material					
			Material as per table 400-13					
			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)**	

Sr No	Ref. 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	0.160	0.160	0.160	
			Mazdoor skilled	day	1.000	1.000	1.000	
			Mazdoor	day	3.000	3.000	3.000	
			b) Machinery					
			Wet mix plant					
			(i) 250 tonne per hour	hour	2.640			
			(ii) 200 tonne per hour	hour		3.300		
			(iii) 100 tonne per hour	hour			6.600	
			Electric generator					
			(i) 125 KVA	hour	2.640			
			(ii) 100 KVA	hour		3.300		
			(iii) 62.5 KVA	hour			6.600	
			Front end loader for loading to Tipper					
			(i) 3.1 Cum Capacity	hour	2.640			
			(ii) 2.1 Cum Capacity	hour		3.300		
			(iii) 1 Cum Capacity	hour			6.600	
			Tipper					
			For Transportation					
			(i) 18 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) 18 cum capacity	hour	2.640			
			(ii) 14 cum capacity	hour		3.300		
			(iii) 10 cum capacity	hour			6.600	
			Motor Grader					
			(i) Motor grader 4.30 metre blade	hour	1.815			
			(ii) Motor grader 3.70 metre blade	hour		2.189		
			(iii) Motor grader 3.35 metre blade	hour			2.441	
			Vibratory roller	hour	1.456	1.456	1.456	

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Material					
		Material as per table 400-13					
		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)**	
		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					
4.15	**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	0.160	0.160	0.160	
		Mazdoor skilled	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	2.640			
		(ii) 200 tonne per hour	hour		3.300		
		(iii) 100 tonne per hour	hour			6.600	
		Electric generator					
		(i) 125 KVA	hour	2.640			
		(ii) 100 KVA	hour		3.300		
		(iii) 62.5 KVA	hour			6.600	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.640			
		(ii) 2.1 Cum Capacity	hour		3.300		
		(iii) 1 Cum Capacity	hour			6.600	
		Tipper					
		For Transportation					
		(i) 18 cum capacity	t.km	495 x L2			
		(ii) 14 cum capacity	t.km		495 x L2		

Sr No	Ref. 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) 18 cum capacity	hour	5.280			
		(ii) 14 cum capacity	hour		5.940		
		(iii) 10 cum capacity	hour			9.240	
		Vibratory roller	hour	2.112	2.112	2.112	
		Mechanical Paver finisher	hour	2.640	2.640	2.640	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.722 x L1 + 1.733			
		(ii) 12 KL capacity	hour		0.963 x L1 + 2.31		
		(iii) 6 KL capacity	hour			1.925 x L1 + 4.62	
		c) Material					
		Material as per table 400-13					
		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	0.240	0.240	0.240	
		Mazdoor	day	6.000	6.000	6.000	
		b) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.018 x L1 + 0.004			
		(ii) 12 KL capacity	hour		0.023 x L1 + 0.005		

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			0.047 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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.236			
		(ii) 1.1 cum bucket capacity	hour		0.271		
		(iii) 0.9 cum bucket capacity	hour			0.379	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	0.236			
		(ii) 14 cum capacity	hour		0.271		
		(iii) 10 cum capacity	hour			0.379	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.018 x L1 + 0.002			
		(ii) 12 KL capacity	hour		0.023 x L1 + 0.003		
		(iii) 6 KL capacity	hour			0.047 x L1 + 0.006	
		Plate compactor	hour	1.400	1.400	1.400	

Sr No	Ref. 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	1.360	1.360	1.360	
	Mason	day	4.000	4.000	4.000	
	Mazdoor	day	30.000	30.000	30.000	
	b) Machinery					
	Vibratory roller	hour	0.750	0.750	0.750	
	Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
	(i) 16 KL capacity	hour	0.083 x L1 + 0.04			

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 12 KL capacity	hour		0.111 x L1 + 0.053		
		(iii) 6 KL capacity	hour			0.222 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	**407**	**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 407 to form a layer of sub-base/Base					
		Unit = cum					
		Taking output = 360 cum					
		A By Mix in Place Method					
		a) Labour					
		Mate	day	0.480	0.480	0.480	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	10.000	10.000	10.000	
		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					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 3.1 Cum Capacity	hour	6.429			
		(ii) 2.1 Cum Capacity	hour		9.474		
		(iii) 1 Cum Capacity	hour			20.000	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	2.903			
		(ii) Motor grader 3.70 metre blade	hour		3.502		
		(iii) Motor grader 3.35 metre blade	hour			3.905	
		Vibratory roller	hour	2.330	2.330	2.330	
		or					
		Smooth 3 wheeled steel roller	hour	4.660	4.660	4.660	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.96			
		(ii) 12 KL capacity	hour		0.333 x L1 + 1.28		
		(iii) 6 KL capacity	hour			0.667 x L1 + 2.56	
		c) Material					
		i) For 53 mm maximum size (Table-400-14)					
		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 37.5 mm maximum size (Table-400-14)					
		37.5 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 37.5 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

Sr No	Ref. 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	0.280	0.280	0.280	
		Mazdoor skilled	day	1.000	1.000	1.000	
		Mazdoor	day	6.000	6.000	6.000	
		b) Machinery					
		Wet mix plant					
		(i) 250 tonne per hour	hour	2.400			
		(ii) 200 tonne per hour	hour		3.000		
		(iii) 100 tonne per hour	hour			6.000	
		Electric generator					
		(i) 125 KVA	hour	2.400			
		(ii) 100 KVA	hour		3.000		
		(iii) 62.5 KVA	hour			6.000	
		Front end loader for loading to Tipper					
		(i) 3.1 Cum Capacity	hour	2.400			
		(ii) 2.1 Cum Capacity	hour		3.000		
		(iii) 1 Cum Capacity	hour			6.000	
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	1.815			
		(ii) Motor grader 3.70 metre blade	hour		2.189		
		(iii) Motor grader 3.35 metre blade	hour			2.441	
		Vibratory roller	hour	2.400	2.400	2.400	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.125 x L1 + 0.3			
		(ii) 12 KL capacity	hour		0.167 x L1 + 0.4		
		(iii) 6 KL capacity	hour			0.333 x L1 + 0.8	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	2.400			
		(ii) 14 cum capacity	hour		3.000		
		(iii) 10 cum capacity	hour			6.000	
		c) Material					
		Aggregate at site					
		i) For 53 mm maximum size (Table-400-14)					
		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	

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Or					
		ii) For 37.5 mm maximum size (Table-400-14)					
		37.5 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 37.5 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**	**Lime, Fly ash Stabilised Soil Sub-Base** Construction of Sub-base using lime - Fly ash 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. **Unit = cum** **Taking output = 480 cum** **(720 tonne, density 1.50 t/cum)** **Assumptions made** Total mass taken for analysis = 720 Tonne Lime + Fly ash admixture @ 20 percent = 0.2 x 720=144 Tonne Soil = 720 -144 = 576 Tonne 576 /1.6 = 360 cum Lime + Fly ash = 144 t Ratio Lime 4 : Fly ash 16 Lime = 29 t. Fly ash = 115 t.					

Sr No	Ref. M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	4.038			
		(ii) 1.1 cum bucket capacity	hour		4.650		
		(iii) 0.9 cum bucket capacity	hour			6.502	
		Tipper					
		For transportation					
		(i) 18 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) 18 cum capacity	hour	4.038			
		(ii) 14 cum capacity	hour		4.650		
		(iii) 10 cum capacity	hour			6.502	
		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	3.302			
		(ii) Motor grader 3.70 metre blade	hour		3.982		
		(iii) Motor grader 3.35 metre blade	hour			4.441	
		Vibratory roller	hour	6.000	6.000	6.000	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.3 x L1 + 1.572			
		(ii) 12 KL capacity	hour		0.4 x L1 + 2.096		
		(iii) 6 KL capacity	hour			0.8 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.
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.

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

3. Lime + Fly ash have 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 mentions 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

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.

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/sqm using mechanical means.					
		Unit = sqm					
		Taking output = 7000 sqm					
		a) Labor					
		Mate	day	0.080	0.080	0.080	
		Maduro	day	2.000	2.000	2.000	
		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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 4.0 Km/hr.)					
		(I) 16 KL capacity	hour	0.073 x L1 + 0.613			
		(ii) 12 KL capacity	hour		0.097 x L1 + 0.817		
		(iii) 6 KL capacity	hour			0.194 x L1 + 1.633	
		c) Material					
		SS1 grade Bitumen emulsion @ 0.70 kg per sqm	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 sqm 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.

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/sqm using mechanical means. **Unit = sqm** **Taking output = 7000 sqm**					
		a) Labor					
		Mate	day	0.080	0.080	0.080	
		Maduro	day	2.000	2.000	2.000	
		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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 4.0 Km/hr.)					
		(I) 16 KL capacity	hour	0.073 x L1 + 0.613			
		(ii) 12 KL capacity	hour		0.097 x L1 + 0.817		
		(iii) 6 KL capacity	hour			0.194 x L1 + 1.633	
		c) Material					
		Cutback Bitumen MC 30 @ 0.60 kg per sqm	tonne	4.200	4.200	4.200	
		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 @ 0.60 kg per sqm 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.

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/sqm using mechanical means.					
		Unit = sqm					
		Taking output = 7000 sqm					
		a) Labor					
		Mate	day	0.080	0.080	0.080	
		Maduro	day	2.000	2.000	2.000	
		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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 4.0 Km/hr)					
		(I) 16 KL capacity	hour	0.073 x L1 + 0.613			
		(ii) 12 KL capacity	hour		0.097 x L1 + 0.817		
		(iii) 6 KL capacity	hour			0.194 x L1 + 1.633	
		c) Material					
		SS1 grade Bitumen emulsion @ 0.9 kg per sqm	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 sqm 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.

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/sqm using mechanical means.					
		Unit = sqm					
		Taking output = 7000 sqm					
		a) Labor					
		Mate	day	0.080	0.080	0.080	
		Maduro	day	2.000	2.000	2.000	
		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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 4.0 Km/hr.)					
		(I) 16 KL capacity	hour	0.073 x L1 + 0.613			
		(ii) 12 KL capacity	hour		0.097 x L1 + 0.817		
		(iii) 6 KL capacity	hour			0.194 x L1 + 1.633	
		c) Material					
		Cutback Bitumen MC 70 @ 0.9 kg per sqm	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 sqm 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.

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 sqm on the prepared bituminous surface cleaned with mechanical broom. **Unit = sqm** **Taking output = 7000 sqm**					
		a) Labor					
		Mate	day	0.080	0.080	0.080	
		Maduro	day	2.000	2.000	2.000	
		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 sqm	tonne	1.400	1.400	1.400	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 sqm 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 sqm on the prepared bituminous surface cleaned with mechanical broom. **Unit = sqm** **Taking output = 7000 sqm**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labor					
		Mate	day	0.080	0.080	0.080	
		Maduro	day	2.000	2.000	2.000	
		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 sqm	tonne	1.750	1.750	1.750	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 @ 0.25 kg per sqm 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 sqm 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 sqm on the prepared bituminous surface cleaned with mechanical broom. **Unit = sqm** **Taking output = 7000 sqm**					
			a) Labor					
			Mate	day	0.080	0.080	0.080	
			Maduro	day	2.000	2.000	2.000	
			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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Material					
		Bitumen emulsion @ 0.30 kg per sqm	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 sqm 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 sqm 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	0.440	0.440	0.440	
		Maduro	day	6.000	6.000	6.000	
		Maduro skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Batch Type Hot Mix Plant					
		(I) HMP 200 TPH	hour	3.007			
		(ii) HMP 160 TPH	hour		3.758		
		(iii) HMP 120 TPH	hour			5.011	
		Mechanical broom (2.1m sweeping width)	hour	0.697	0.697	0.697	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	3.007			
		(ii) Paver (240HP)	hour		3.758		
		(iii) Paver (174HP)	hour			5.011	
		Electric generator					
		(I) 500 KVA	hour	3.007			
		(ii) 400 KVA	hour		3.758		
		(iii) 250 KVA	hour			5.011	
		Front end loader for feeding the plant					
		(I) 3.1 Cum Capacity	hour	4.618			
		(ii) 2.1 Cum Capacity	hour		6.826		
		(iii) 1 Cum Capacity	hour			14.273	
		Tipper					
		For Transportation					
		(I) 18 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	
		For loading & unloading time					
		(I) 18 cum capacity	hour	6.013			
		(ii) 14 cum capacity	hour		7.517		
		(iii) 10 cum capacity	hour			10.022	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	7.256	7.256	7.256	
		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	
		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 below15 percent	cum	14.537	14.537	14.537	
		* Any one of the alternative					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 mazdoors 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	0.440	0.440	0.440		
		Maduro	day	6.000	6.000	6.000		
		Maduro skilled	day	5.000	5.000	5.000		
		b) Machinery						
		Batch Type Hot Mix Plant						
		(I) HMP 200 TPH	hour	3.007				
		(ii) HMP 160 TPH	hour		3.758			
		(iii) HMP 120 TPH	hour			5.011		
		Mechanical broom (2.1m sweeping width)	hour	0.976	0.976	0.976		

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	3.007			
		(ii) Paver (240HP)	hour		3.758		
		(iii) Paver (174HP)	hour			5.011	
		Electric generator					
		(i) 500 KVA	hour	3.007			
		(ii) 400 KVA	hour		3.758		
		(iii) 250 KVA	hour			5.011	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.125			
		(ii) 2.1 Cum Capacity	hour		7.577		
		(iii) 1 Cum Capacity	hour			15.842	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.013			
		(ii) 14 cum capacity	hour		7.517		
		(iii) 10 cum capacity	hour			10.022	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	10.159	10.159	10.159	
		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					
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 MoRT&H specification clause No. 505 complete in all respects.				
			Unit = cum				
			Taking output = 195 cum				
			a) Labour				
			Mate	day	0.440	0.440	0.440
			Mazdoor	day	6.000	6.000	6.000
			Mazdoor skilled	day	5.000	5.000	5.000
			b) Machinery				
			Hot Mix Plant				
			(i) HMP 200 TPH	hour	3.003		
			(ii) HMP 160 TPH	hour		3.754	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) HMP 120 TPH	hour			5.005	
		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	3.003			
		(ii) Paver (240HP)	hour		3.754		
		(iii) Paver (174HP)	hour			5.005	
		Electric generator					
		(i) 500 KVA	hour	3.003			
		(ii) 400 KVA	hour		3.754		
		(iii) 250 KVA	hour			5.005	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.138			
		(ii) 2.1 Cum Capacity	hour		7.596		
		(iii) 1 Cum Capacity	hour			15.882	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.006			
		(ii) 14 cum capacity	hour		7.508		
		(iii) 10 cum capacity	hour			10.010	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	9.663	9.663	9.663	
		c) Material					
		i) Bitumen@ 4 percent of mix	tonne	18.018	18.018	18.018	
		weight of mix = 205 x 2.231 = 450.450 tonne					
		ii) Aggregate					
		Total weight of mix =	450.45	tonnes			
		Weight of bitumen =	18.02	tonnes			
		Weight of aggregate =	432.43	tonnes			
		Taking density of aggregate = 1.5 tonne/cum					
		Grading – 1 37.5 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	cum	126.847	126.847	126.847	

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			percent 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					
			Grading – 1 37.5 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 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 MoRT&H specification clause No. 505 complete in all respects. **Unit = cum** **Taking output = 195 Cum**					
			a) Labour					
			Mate	day	0.440	0.440	0.440	
			Mazdoor	day	6.000	6.000	6.000	
			Mazdoor skilled	day	5.000	5.000	5.000	
			b) Machinery					
			Hot Mix Plant					
			(i) HMP 200 TPH	hour	3.003			
			(ii) HMP 160 TPH	hour		3.754		
			(iii) HMP 120 TPH	hour			5.005	
			Mechanical broom (2.1m sweeping width)	hour	0.663	0.663	0.663	
			Air compressor 250 cfm	hour	0.663	0.663	0.663	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.003			
		(ii) Paver (240HP)	hour		3.754		
		(iii) Paver (174HP)	hour			5.005	
		Electric generator					
		(i) 500 KVA	hour	3.003			
		(ii) 400 KVA	hour		3.754		
		(iii) 250 KVA	hour			5.005	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.112			
		(ii) 2.1 Cum Capacity	hour		7.556		
		(iii) 1 Cum Capacity	hour			15.799	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.006			
		(ii) 14 cum capacity	hour		7.508		
		(iii) 10 cum capacity	hour			10.010	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	9.663	9.663	9.663	
		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					
		Grading – 2, 26.5 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 perapproved design					
		Grading – 2, 26.5 mm (Nominal Size)					

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

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 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.

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.

5.05 **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 achieve the desired compaction as per MORT&H specification clause No. 507 complete in all respects

Unit = cum
Taking output = 191 cum

a)	**Labour**				
	Mate	day	0.440	0.440	0.440
	Mazdoor	day	6.000	6.000	6.000
	Mazdoor skilled	day	5.000	5.000	5.000
b)	**Machinery**				

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.005			
		(ii) HMP 160 TPH	hour		3.756		
		(iii) HMP 120 TPH	hour			5.008	
		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	3.005			
		(ii) Paver (240HP)	hour		3.756		
		(iii) Paver (174HP)	hour			5.008	
		Electric generator					
		(i) 500 KVA	hour	3.005			
		(ii) 400 KVA	hour		3.756		
		(iii) 250 KVA	hour			5.008	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.078			
		(ii) 2.1 Cum Capacity	hour		7.506		
		(iii) 1 Cum Capacity	hour			15.694	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.010			
		(ii) 14 cum capacity	hour		7.513		
		(iii) 10 cum capacity	hour			10.017	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.831	11.831	11.831	
		Pneumatic Tyre roller	hour	2.404	3.005	4.007	
		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 - 1-19 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	

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			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 MORT&H specification clause No. 507 complete in all respects **Unit = cum** **Taking output = 191 Cum**					
			a) Labour					
			Mate	day	0.440	0.440	0.440	
			Mazdoor	day	6.000	6.000	6.000	
			Mazdoor skilled	day	5.000	5.000	5.000	
			b) Machinery					
			Hot Mix Plant					
			(i) HMP 200 TPH	hour	3.005			
			(ii) HMP 160 TPH	hour		3.756		
			(iii) HMP 120 TPH	hour			5.008	
			Mechanical broom (2.1m sweeping width)	hour	1.624	1.624	1.624	
			Air compressor 250 cfm	hour	1.624	1.624	1.624	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.005			
		(ii) Paver (240HP)	hour		3.756		
		(iii) Paver (174HP)	hour			5.008	
		Electric generator					
		(i) 500 KVA	hour	3.005			
		(ii) 400 KVA	hour		3.756		
		(iii) 250 KVA	hour			5.008	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.004			
		(ii) 2.1 Cum Capacity	hour		7.378		
		(iii) 1 Cum Capacity	hour			15.553	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.010			
		(ii) 14 cum capacity	hour		7.513		
		(iii) 10 cum capacity	hour			10.017	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	16.902	16.902	16.902	
		Pneumatic Tyre roller	hour	2.404	3.005	4.007	
		c) Material					
		i) Bitumen@ 5.4 percent of mix	tonne	24.341	24.341	24.341	
		ii) Aggregate					
		Total weight of mix =	450.76	tonnes			
		Weight of bitumen =	24.34	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	59.699	59.699	59.699	
		10 - 5 mm 17 percent	cum	48.327	48.327	48.327	
		5 mm and below 60 percent	cum	170.568	170.568	170.568	
		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					

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 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**					
5.06	Case –I	**19 mm nominal chipping size**					
		a) Labour					
		Mate	day	0.440	0.440	0.440	
		Mazdoor	day	9.000	9.000	9.000	
		Mazdoor skilled	day	2.000	2.000	2.000	
		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	0.823			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 2.1 Cum Capacity	hour		1.216		
		(iii) 1 Cum Capacity	hour			2.547	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	8.224			
		(ii) 14 cum capacity	hour		8.618		
		(iii) 10 cum capacity	hour			9.948	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	5.973	5.973	5.973	
		Pneumatic Tyre roller	hour	5.973	5.973	5.973	
		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					
5.06	**509 Case – II**	**13 mm nominal size chipping**					
		Unit = sqm					
		Taking output = 9000 sqm					
		a) Labour					
		Mate	day	0.440	0.440	0.440	
		Mazdoor	day	9.000	9.000	9.000	
		Mazdoor skilled	day	2.000	2.000	2.000	
		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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Front end loader for loading					
		(i) 3.1 Cum Capacity	hour	0.544			
		(ii) 2.1 Cum Capacity	hour		0.804		
		(iii) 1 Cum Capacity	hour			1.688	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	7.946			
		(ii) 14 cum capacity	hour		8.205		
		(iii) 10 cum capacity	hour			9.089	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	3.982	3.982	3.982	
		Pneumatic Tyre roller	hour	3.982	3.982	3.982	
		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)**	
		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**					
	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 2. Input for the second coat, where required, will be the same as per the Ist 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 Viscocity grade bitumen to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 = sqm					
		Taking output = 10250 sqm					
		a) Labour					
		Mate	day	0.440	0.440	0.440	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.225			
		(ii) HMP 160 TPH	hour		4.032		
		(iii) HMP 120 TPH	hour			5.376	
		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	3.225			
		(ii) Paver (240HP)	hour		4.032		
		(iii) Paver (174HP)	hour			5.376	
		Electric generator					
		(i) 500 KVA	hour	3.225			
		(ii) 400 KVA	hour		4.032		
		(iii) 250 KVA	hour			5.376	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	4.942			
		(ii) 2.1 Cum Capacity	hour		7.283		
		(iii) 1 Cum Capacity	hour			15.375	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.451			
		(ii) 14 cum capacity	hour		8.063		
		(iii) 10 cum capacity	hour			10.751	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 Viscocity 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 = sqm** **Taking output = 10250 sqm**					
		a) Labour					
		Mate	day	0.440	0.440	0.440	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.225			
		(ii) HMP 160 TPH	hour		4.032		
		(iii) HMP 120 TPH	hour			5.376	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	3.225			
		(ii) Paver (240HP)	hour		4.032		
		(iii) Paver (174HP)	hour			5.376	
		Electric generator					
		(i) 500 KVA	hour	3.225			
		(ii) 400 KVA	hour		4.032		
		(iii) 250 KVA	hour			5.376	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	3.225			
		(ii) 2.1 Cum Capacity	hour		7.283		
		(iii) 1 Cum Capacity	hour			15.375	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.451			
		(ii) 14 cum capacity	hour		8.063		
		(iii) 10 cum capacity	hour			10.751	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
	(i)	**Case - I : Type A**					
		Unit = sqm					
		Taking output = 10250 sqm					
		a) Labour					
		Mate	day	0.240	0.240	0.240	
		Mazdoor	day	6.000	6.000	6.000	
		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	0.563			
		(ii) 2.1 Cum Capacity	hour		0.831		
		(iii) 1 Cum Capacity	hour			1.741	
		Tipper					
		For loading time					
		(i) 18 cum capacity	hour	0.563			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 14 cum capacity	hour		0.831		
		(iii) 10 cum capacity	hour			1.741	
		For Transportation					
		(i) 18 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) 18 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	4.082	4.082	4.082	
		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)**	
		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	0.440	0.440	0.440	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	5.000	5.000	5.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	0.314			
		(ii) HMP 160 TPH	hour		0.393		
		(iii) HMP 120 TPH	hour			0.524	
		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	0.314			
		(ii) Paver (240HP)	hour		0.393		
		(iii) Paver (174HP)	hour			0.524	
		Electric generator					
		(i) 500 KVA	hour	0.314			
		(ii) 400 KVA	hour		0.393		
		(iii) 250 KVA	hour			0.524	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	0.832			
		(ii) 2.1 Cum Capacity	hour		1.230		
		(iii) 1 Cum Capacity	hour			2.572	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	0.629			
		(ii) 14 cum capacity	hour		0.786		
		(iii) 10 cum capacity	hour			1.048	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	2.087	2.087	2.087	
		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					

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 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 are not available, nearest crusher site may be ascertained. Loading and un-loading 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 pre-coated fine grained 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		both directions, pressed into surface when the temperature of surfaces is not less than 1000C, 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	0.440	0.440	0.440	
		Mazdoor	day	10.000	10.000	10.000	
		Mazdoor skilled	day	1.000	1.000	1.000	
		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	
		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 CRRI for a specific case)					
		i) Bitumen 85/25 or 30/40 @ 10.2 percent by weight of mix. 2 x 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 x 31.9/100 = 0.638 tonnes = 0.638/1.625 = 0.39	cum	0.395	0.395	0.395	
		iii) Lime stone dust	tonne	0.361	0.361	0.361	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		filler with calcium content not less than 80 percent by weight @ 17.92 percent by weight of mix = 2 x 17.92/100 = 0.36					
		iv) Coarse aggregates 6.3 mm to 13.2 mm @ 40 percent by weight of mix = 2 x 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 x 0.005/10 = 0.018	cum	0.018	0.018	0.018	
		vi) Bitumen for coating of chips @ 2 percent by weight = 0.018 x 1.456 x 2/100 = 0.0005 MT = 0.5kg	kg	0.510	0.510	0.510	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 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 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.
4. This rate analysis is based on design made by CRRI for a specific case and is meant for 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)

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = sqm					
		Taking output = 24000 sqm (60 cum)					
		Taking density of 2.2 tonnes per cum					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Mazdoor	day	5.000	5.000	5.000	
		b) Machinery					
		Mechanical broom (2.1m sweeping width)	hour	7.143	7.143	7.143	
		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	0.366			
		(ii) 2.1 Cum Capacity	hour		0.541		
		(iii) 1 Cum Capacity	hour			1.132	
		Tipper					
		Tipper for loading time					
		(i) 18 cum capacity	hour	0.366			
		(ii) 14 cum capacity	hour		0.541		
		(iii) 10 cum capacity	hour			1.132	
		For Transportation					
		(i) 18 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	
		Tipper for unloading time					
		(i) 18 cum capacity	hour	6.579			
		(ii) 14 cum capacity	hour		6.579		
		(iii) 10 cum capacity	hour			6.579	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.083 x L1 + 3.200			
		(ii) 12 KL capacity	hour		0.111 x L1 + 4.267		
		(iii) 6 KL capacity	hour			0.222 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	cum	75.240	75.240	75.240	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
		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	0.240	0.240	0.240	
		Mazdoor	day	6.000	6.000	6.000	
	b)	**Machinery**					
		Mechanical broom (2.1m sweeping width)	hour	4.762	4.762	4.762	
		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	0.488			
		(ii) 2.1 Cum Capacity	hour		0.721		
		(iii) 1 Cum Capacity	hour			1.509	
		Tipper					
		Tipper for loading time					
		(i) 18 cum capacity	hour	0.488			
		(ii) 14 cum capacity	hour		0.721		
		(iii) 10 cum capacity	hour			1.509	
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	4.386			
		(ii) 14 cum capacity	hour		4.386		
		(iii) 10 cum capacity	hour			4.386	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.083 x L1 + 2.133			
		(ii) 12 KL capacity	hour		0.111 x L1 + 2.844		
		(iii) 6 KL capacity	hour			0.222 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)**	
	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	0.280	0.280	0.280	
		Mazdoor	day	7.000	7.000	7.000	
	b)	**Machinery**					
		Mechanical broom (2.1m sweeping width)	hour	3.571	3.571	3.571	
		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	0.512			
		(ii) 2.1 Cum Capacity	hour		0.757		
		(iii) 1 Cum Capacity	hour			1.585	
		Tipper					
		Tipper for loading time					
		(i) 18 cum capacity	hour	0.512			
		(ii) 14 cum capacity	hour		0.757		
		(iii) 10 cum capacity	hour			1.585	
		For Transportation					
		(i) 18 cum capacity	t.km	184.8 x L1			
		(ii) 14 cum capacity	t.km		184.8 x L1		

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity	t.km			184.8 x L1	
		Tipper for unloading time					
		(i) 18 cum capacity	hour	3.289			
		(ii) 14 cum capacity	hour		3.289		
		(iii) 10 cum capacity	hour			3.289	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.083 x L1 + 1.600			
		(ii) 12 KL capacity	hour		0.111 x L1 + 2.133		
		(iii) 6 KL capacity	hour			0.222 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 2.2 x 0.895 = 165.396 tonnes. Taking density 1.5, = 165.396/1.5 = 110.264 cum	cum	110.264	110.264	110.264	
		Filler @ 1.5 percent of total mix = 84 x 2.2 x 0.015	tonne	2.772	2.772	2.772	
		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 12000 sqm = a+b+c+d+e					
		Rate per sqm = (a+b+c+d+e)/12000					

Note 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 percent 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

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		at site and compacting to the required grade, level and thickness, all as specified in clause 519.					
		Unit = cum					
		Taking output = 120 cum					
A	(i)	**Using by Bituminous Macadam Grading -I**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	3.000	3.000	3.000	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	5.926			
		Milling Machine With 1.3 meter Drum Width	hour		9.117		
		Milling Machine with 1.2 meter Drum Width	hour			9.877	
		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	1.840			
		(ii) HMP 160 TPH	hour		2.300		
		(iii) HMP 120 TPH	hour			3.067	
		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	1.840			
		(ii) Paver (240HP)	hour		2.300		
		(iii) Paver (174HP)	hour			3.067	
		Electric generator					
		(i) 500 KVA	hour	1.840			
		(ii) 400 KVA	hour		2.300		
		(iii) 250 KVA	hour			3.067	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	1.868			
		(ii) 2.1 Cum Capacity	hour		2.762		
		(iii) 1 Cum Capacity	hour			5.775	
		Tipper					
		For Transportation Plant to site					
		(i) 18 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 18 cum capacity	hour	3.680			
		(ii) 14 cum capacity	hour		4.600		
		(iii) 10 cum capacity	hour			6.133	
		For Transportation of dismantle material Site to Plant					
		(i) 18 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) 18 cum capacity	hour	5.926			
		(ii) 14 cum capacity	hour		9.117		
		(iii) 10 cum capacity	hour			9.877	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	10.619	10.619	10.619	
	c)	**Material**					
	i)	**Bitumen**					
		A bitumen content is 3.3 percent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 percent 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 percent = 82.8 x 0.60 x0.033 = 1.639	tonne	1.639	1.639	1.639	
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.033= 6.376	tonne	6.376	6.376	6.376	
	ii)	**Aggregates**					
		Percentage of mix requiring fresh aggregates - 70 percent					
		Weight of fresh mix = 276 x 0.70 = 193.2 tonne					
		Weight of fresh aggregate in the mix = 193.2 x 0.967 = 186.824 tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 124.550 cum.					
		Size wise requirement of fresh aggregates					
		***Grading I (40 mm nominal size)**					
		37.5 - 25 mm 15 percent	cum	18.683	18.683	18.683	
		25 - 10 mm 45 percent	cum	56.048	56.048	56.048	
		10 - 5 mm 25 percent	cum	31.138	31.138	31.138	
		5 mm and below 15 percent	cum	18.683	18.683	18.683	
		Credit for milled material for use (70 Percent),Considering 20 percent cost as salvage value of	cum	124.550	124.550	124.550	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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**					
A	**(ii)**	**Using by Bituminous Macadam Grading -II**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	3.000	3.000	3.000	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	5.926			
		Milling Machine With 1.3 meter Drum Width	hour		9.117		
		Milling Machine with 1.2 meter Drum Width	hour			9.877	
		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	1.840			
		(ii) HMP 160 TPH	hour		2.300		
		(iii) HMP 120 TPH	hour			3.067	
		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	1.840			
		(ii) Paver (240HP)	hour		2.300		
		(iii) Paver (174HP)	hour			3.067	
		Electric generator					
		(i) 500 KVA	hour	1.840			
		(ii) 400 KVA	hour		2.300		
		(iii) 250 KVA	hour			3.067	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.196			
		(ii) 2.1 Cum Capacity	hour		3.246		
		(iii) 1 Cum Capacity	hour			6.787	
		Tipper					
		For Transportation Plant to site					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 18 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) 18 cum capacity	hour	3.680			
		(ii) 14 cum capacity	hour		4.600		
		(iii) 10 cum capacity	hour			6.133	
		For Transportation of dismantle material Site to Plant					
		(i) 18 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) 18 cum capacity	hour	5.926			
		(ii) 14 cum capacity	hour		9.117		
		(iii) 10 cum capacity	hour			9.877	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	10.619	10.619	10.619	
	c)	**Material**					
	i)	**Bitumen**					
		A bitumen content is 3.4 percent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 percent 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 percent = 82.8 x 0.60 x0.034 = 1.689	tonne	1.689	1.639	1.639	
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.034= 6.569	tonne	6.569	6.376	6.376	
	ii)	**Aggregates**					
		Percentage of mix requiring fresh aggregates - 70 percent Weight of fresh mix = 276 x 0.70 = 193.2 tonne 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 percent	cum	49.768	49.768	49.768	
		10 - 5 mm 40 percent	cum	49.768	49.768	49.768	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		5 mm and below 20 percent	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	cum	124.421	124.421	124.421	
		* Any one of the alternative may be adopted as per approved design					
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ 1on (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					
B	**(i)**	**Using by Dense Graded Bituminous Macadam Grading -I**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	3.000	3.000	3.000	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	5.926			
		Milling Machine With 1.3 meter Drum Width	hour		9.117		
		Milling Machine with 1.2 meter Drum Width	hour			9.877	
		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	1.840			
		(ii) HMP 160 TPH	hour		2.300		
		(iii) HMP 120 TPH	hour			3.067	
		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	1.840			
		(ii) Paver (240HP)	hour		2.300		
		(iii) Paver (174HP)	hour			3.067	
		Electric generator					
		(i) 500 KVA	hour	1.840			
		(ii) 400 KVA	hour		2.300		
		(iii) 250 KVA	hour			3.067	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	1.840			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 2.1 Cum Capacity	hour		2.300		
		(iii) 1 Cum Capacity	hour			3.642	
		Tipper					
		For Transportation Plant to site					
		(i) 18 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) 18 cum capacity	hour	3.680			
		(ii) 14 cum capacity	hour		4.600		
		(iii) 10 cum capacity	hour			6.133	
		For Transportation of dismantle material Site to Plant					
		(i) 18 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) 18 cum capacity	hour	5.926			
		(ii) 14 cum capacity	hour		9.117		
		(iii) 10 cum capacity	hour			9.877	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	10.619	10.619	10.619	
	c)	**Material**					
	i)	**Bitumen**					
		A bitumen content is 4.0 percent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 percent 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 percent = 82.8 x 0.60 x0.04 = 1.987	tonne	1.987	1.987	1.987	
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.04= 7.728	tonne	7.728	7.728	7.728	
	ii)	**Aggregates**					
		Percentage of mix requiring fresh aggregates - 70 percent					
		Weight of fresh mix = 276 x 0.70 = 193.2 tonne					
		Weight of fresh aggregate in the mix = 193.2 x 0.96 = 185.472 tonne					
		Taking average density of 1.5 tonnes/cum, total volume of aggregate = 123.648 cum.					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Size wise requirement of fresh aggregates					
		***Grading I (40 mm nominal size)**					
		37.5 - 25 mm 22 percent	cum	27.203	27.203	27.203	
		25 - 10 mm 13 percent	cum	16.074	16.074	16.074	
		10 -4.75 mm 19 percent	cum	23.493	23.493	23.493	
		4.75 mm and below 44 percent	cum	54.405	54.405	54.405	
		Filler @ 2 percent 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	cum	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					
B	**(ii)**	**Using by Dense Graded Bituminous Macadam Grading -II**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	3.000	3.000	3.000	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	5.926			
		Milling Machine With 1.3 meter Drum Width	hour		9.117		
		Milling Machine with 1.2 meter Drum Width	hour			9.877	
		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	1.840			
		(ii) HMP 160 TPH	hour		2.300		
		(iii) HMP 120 TPH	hour			3.067	
		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	1.840			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) Paver (240HP)	hour		2.300		
		(iii) Paver (174HP)	hour			3.067	
		Electric generator					
		(i) 500 KVA	hour	1.840			
		(ii) 400 KVA	hour		2.300		
		(iii) 250 KVA	hour			3.067	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.127			
		(ii) 2.1 Cum Capacity	hour		3.145		
		(iii) 1 Cum Capacity	hour			6.575	
		Tipper					
		For Transportation Plant to site					
		(i) 18 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) 18 cum capacity	hour	3.680			
		(ii) 14 cum capacity	hour		4.600		
		(iii) 10 cum capacity	hour			6.133	
		For Transportation of dismantle material Site to Plant					
		(i) 18 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) 18 cum capacity	hour	5.926			
		(ii) 14 cum capacity	hour		9.117		
		(iii) 10 cum capacity	hour			9.877	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	10.619	10.619	10.619	
	c)	**Material**					
	i)	**Bitumen**					
		A bitumen content is 4.5 percent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 percent 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 percent = 82.8 x 0.60 x0.045 = 1.689	tonne	2.236	2.236	2.236	
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.045= 6.569	tonne	8.694	8.694	8.694	
	ii)	**Aggregates**					
		Percentage of mix requiring fresh					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		aggregates - 70 percent Weight of fresh mix = 276 x 0.70 = 193.2 tonne Weight of fresh aggregate in the mix = 193.2 x 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 percent	cum	36.901	36.901	36.901	
		10 - 5 mm 28 percent	cum	34.441	34.441	34.441	
		5 mm and below 40 percent	cum	49.202	49.202	49.202	
		Filler @ 2 percent 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	cum	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**					
C	(i)	**Using By Bituminous Concrete Grading-I**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	3.000	3.000	3.000	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	5.926			
		Milling Machine With 1.3 meter Drum Width	hour		9.117		
		Milling Machine with 1.2 meter Drum Width	hour			9.877	
		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	1.840			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) HMP 160 TPH	hour		2.300		
		(iii) HMP 120 TPH	hour			3.067	
		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	1.840			
		(ii) Paver (240HP)	hour		2.300		
		(iii) Paver (174HP)	hour			3.067	
		Electric generator					
		(i) 500 KVA	hour	1.840			
		(ii) 400 KVA	hour		2.300		
		(iii) 250 KVA	hour			3.067	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.112			
		(ii) 2.1 Cum Capacity	hour		3.122		
		(iii) 1 Cum Capacity	hour			6.527	
		Tipper					
		For Transportation Plant to site					
		(i) 18 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) 18 cum capacity	hour	3.680			
		(ii) 14 cum capacity	hour		4.600		
		(iii) 10 cum capacity	hour			6.133	
		For Transportation of dismantle material Site to Plant					
		(i) 18 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) 18 cum capacity	hour	5.926			
		(ii) 14 cum capacity	hour		9.117		
		(iii) 10 cum capacity	hour			9.877	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour				
	c)	**Material**					
	i)	**Bitumen**					
		A bitumen content is 5.2 percent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 percent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 percent = 82.8 x 0.60 x0.052 = 2.583	tonne	2.583	2.583	2.583	
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.052= 10.046	tonne	10.046	10.046	10.046	
		ii) Aggregates					
		Percentage of mix requiring fresh aggregates - 70 percent					
		Weight of fresh mix = 276 x 0.70 = 193.2 tonne					
		Weight of fresh aggregate in the mix = 193.2 x 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 percent	cum	46.399	46.399	46.399	
		10 - 5 mm 17 percent	cum	20.757	20.757	20.757	
		5 mm and below 43 percent	cum	52.504	52.504	52.504	
		Filler @ 2 percent of weight of aggregates.	cum	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	cum	122.102	122.102	122.102	
		* 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					
C	**(ii)**	**Using By Bituminous Concrete Grading-II**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	3.000	3.000	3.000	
		b) Machinery					
		Milling machine					
		Milling Machine With 2 meter Drum Width	hour	5.926			

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		9.117		
		Milling Machine with 1.2 meter Drum Width	hour			9.877	
		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	1.840			
		(ii) HMP 160 TPH	hour		2.300		
		(iii) HMP 120 TPH	hour			3.067	
		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	1.840			
		(ii) Paver (240HP)	hour		2.300		
		(iii) Paver (174HP)	hour			3.067	
		Electric generator					
		(i) 500 KVA	hour	1.840			
		(ii) 400 KVA	hour		2.300		
		(iii) 250 KVA	hour			3.067	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.107			
		(ii) 2.1 Cum Capacity	hour		3.115		
		(iii) 1 Cum Capacity	hour			6.513	
		Tipper					
		For Transportation Plant to site					
		(i) 18 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) 18 cum capacity	hour	3.680			
		(ii) 14 cum capacity	hour		4.600		
		(iii) 10 cum capacity	hour			6.133	
		For Transportation of dismantle material Site to Plant					
		(i) 18 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) 18 cum capacity	hour	5.926			
		(ii) 14 cum capacity	hour		9.117		
		(iii) 10 cum capacity	hour			9.877	
		Smooth steel wheeled tandem roller for static and vibratory passaes	hour	10.619	10.619	10.619	
	c)	**Material**					
	i)	**Bitumen**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		A bitumen content is 5.4 percent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 percent 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 percent = 82.8 x 0.60 x0.054 = 2.683	tonne	2.683	2.683	2.683	
		Bitumen required for fresh mix of 193.2 tonnes = 193.2 x 0.054= 10.433	tonne	10.433	10.433	10.433	
		ii) Aggregates Percentage of mix requiring fresh aggregates - 70 percent Weight of fresh mix = 276 x 0.70 = 193.2 tonne Weight of fresh aggregate in the mix = 193.2 x 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 percent	cum	25.587	25.587	25.587	
		10 - 5 mm 17 percent	cum	20.714	20.714	20.714	
		5 mm and below 60 percent	cum	73.107	73.107	73.107	
		Filler @ 2 percent of weight of aggregates.	cum	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 * Any one of the alternative may be adopted as per approved design	cum	121.845	121.845	121.845	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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**	Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		mm wide or incipient fretting or disintegration in an existing bituminous surfacing.					
		Unit = sqm					
		Taking output = 10500 sqm					
		(i) a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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	0.160	0.160	0.160	
		Mazdoor for precoating of grit	day	4.000	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 precoating grit @ 2 percent of grit,39.38 x 0.02	tonne	0.790	0.790	0.790	
		Cost for 10500 sqm = a+b					
		Rate per sqm = (a+b)/10500					
5.15	518	**Bituminous Cold Mix (Including Gravel Emulsion)**					
		Providing, laying and rolling					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 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	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		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	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	4.852			
		(ii) 2.1 Cum Capacity	hour		6.923		
		(iii) 1 Cum Capacity	hour			15.081	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	
		Pneumatic Tyre roller	hour	2.569	3.000	4.000	
		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

1. Density of aggregates has been assumed 1.5 gms/cc.
2. 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:-					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		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	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	4.852			
		(ii) 2.1 Cum Capacity	hour		6.923		
		(iii) 1 Cum Capacity	hour			15.081	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	
		Pneumatic Tyre roller	hour	2.569	3.000	4.000	
		c) Material					
		Bitumen emulsion @ 8	tonne	36.000	36.000	36.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		percent					
		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	1.Density of aggregates has been assumed 1.5 gms/cc 2. Tack coat where provided will be measured and paid separately.					
5.15	**(iii)**	**Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate** **Composition of mix** (450 tonne) is assumed to be as under:- Cutback bitumen - 5 percent Filler (lime) - 2 percent Total aggregates - 93 percent **Proportion of aggregates** 19 mm to 9.5 mm26 percent 9.5 mm to 6 mm31 percent 6 mm to 0.075 mm 36 percent					
		a) Labour					
		Mate	day	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) Paver (240HP)	hour	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.009			
		(ii) 2.1 Cum Capacity	hour		7.154		
		(iii) 1 Cum Capacity	hour			15.568	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	
		Pneumatic Tyre roller	hour	2.569	3.000	4.000	
	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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
5.15	(iv)	**Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate** **Composition of mix** (450 tonne) is assumed to be as under:- Cutback bitumen - 5 percent Filler - 2 percent Total aggregates - 93 percent **Proportion of aggregates** 37.5 mm to 19 mm25 percent 19 mm to 6 mm 30 percent 6 mm to 0.075 mm 38 percent					
		a) Labour					
		Mate	day	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		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	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.009			
		(ii) 2.1 Cum Capacity	hour		7.154		
		(iii) 1 Cum Capacity	hour			15.568	
		Tipper					
		For Transportation					
		(i) 18 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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tipper for loading & unloading time					
		(i) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	
		Pneumatic Tyre roller	hour	2.569	3.000	4.000	
		c) Material					
		Cutback bitumen on @ 5 percent	tonne	22.500	22.500	22.500	
		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 x0.38 x 1/1.5	cum	114.000	114.000	114.000	
		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 percum = (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	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.044			
		(ii) 2.1 Cum Capacity	hour		7.441		
		(iii) 1 Cum Capacity	hour			15.664	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	18.141	18.141	18.141	
		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	

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 205 cum = a+b+c+d+e **Rate per cum = (a+b+c+d+e)/205**					
		Note :- Tack coat will be measured and paid separately.					
5.17	517	**(i) Crack Prevention Courses**					
		Stress absorbing membrane (SAM) crack width less than 6 mm 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	0.160	0.160	0.160	
		Mazdoor	day	4.000	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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Crushed stone aggregates 5.6 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	**(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 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	0.160	0.160	0.160	
		Mazdoor	day	4.000	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	

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 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**					
		a) Labour					
		Mate	day	0.240	0.240	0.240	
		Mazdoor	day	4.000	4.000	4.000	
		Mazdoor skilled	day	2.000	2.000	2.000	
		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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.280	0.280	0.280	
		Mazdoor	day	5.000	5.000	5.000	
		Mazdoor skilled	day	2.000	2.000	2.000	
		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	
		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)**	

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 3500 Sqm = a+b+c+d+e					
		Rate per Sqm = (a+b+c+d+e)/3500					
		Note As bitumen overlay construction shall follow closely the fabric placement on the same day, an output of 3500 sqm only has been considered for the analysis which will cover a length of 500 m, of 7 m wide carriageway. This can be conveniently overlaid by a bituminous course in a day					
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	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.400			
		(ii) 2.1 Cum Capacity	hour		8.027		
		(iii) 1 Cum Capacity	hour			16.500	
		Tipper					
		For Transportation					
		(i) 18 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.831	11.831	11.831	
		Pneumatic Tyre roller	hour	2.400	3.000	4.000	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.042 x L1 + 0.182			
		(ii) 12 KL capacity	hour		0.056 x L1 + 0.243		
		(iii) 6 KL capacity	hour			0.111 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) }

1. These mixes are considered suitable for minor repair work and temporary road surface improvement.
2. 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.
3. Tack coat, where provided, will be measured and paid separately.

5.18	**(ii)**	**40 mm thickness**					
	a)	**Labour**					
		Mate	day	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.125			
		(ii) 2.1 Cum Capacity	hour		7.553		
		(iii) 1 Cum Capacity	hour			15.944	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.831	11.831	11.831	
		Pneumatic Tyre roller	hour	2.400	3.000	4.000	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.042 x L1 + 0.342			
		(ii) 12 KL capacity	hour		0.056 x L1 + 0.456		
		(iii) 6 KL capacity	hour			0.111 x L1 + 0.911	
		c) Material					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	31.500	31.500	
		Crushed stone aggregates 14 mm	cum	287.000	287.000	287.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		nominal size					
		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**					
5.18	**(iii)**	**25 mm thickness**					
		a) Labour					
		Mate	day	0.480	0.480	0.480	
		Mazdoor	day	7.000	7.000	7.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		Electric generator					
		(i) 500 KVA	hour	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	4.576			
		(ii) 2.1 Cum Capacity	hour		6.750		
		(iii) 1 Cum Capacity	hour			14.211	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.000			
		(ii) 14 cum capacity	hour		7.500		
		(iii) 10 cum capacity	hour			10.000	
		Paver finisher hydrostatic with sensor control compatible with the hot mix plant					
		(i) Paver (240HP)	hour	3.000			
		(ii) Paver (240HP)	hour		3.750		
		(iii) Paver (174HP)	hour			5.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.831	11.831	11.831	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic Tyre roller	hour	2.400	3.000	4.000	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.042 x L1 + 0.547			
		(ii) 12 KL capacity	hour		0.056 x L1 + 0.729		
		(iii) 6 KL capacity	hour			0.111 x L1 + 1.458	
		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 MORT&H specification clause No. 507 complete in all respects. **Unit = cum** **Taking output = 191 cum**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.440	0.440	0.440	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.005			
		(ii) HMP 160 TPH	hour		3.756		
		(iii) HMP 120 TPH	hour			5.008	
		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	3.005			
		(ii) Paver (240HP)	hour		3.756		
		(iii) Paver (174HP)	hour			5.008	
		Electric generator					
		(i) 500 KVA	hour	3.005			
		(ii) 400 KVA	hour		3.756		
		(iii) 250 KVA	hour			5.008	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	5.078			
		(ii) 2.1 Cum Capacity	hour		7.506		
		(iii) 1 Cum Capacity	hour			15.694	
		Tipper For Transportation Mix					
		(i) 18 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) 18 cum capacity	hour	6.010			
		(ii) 14 cum capacity	hour		7.513		
		(iii) 10 cum capacity	hour			10.017	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	11.831	11.831	11.831	
		Pneumatic Tyre roller	hour	2.404	3.005	4.007	
		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			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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**					
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 MORT&H specification clause No. 507 complete in all respects **Unit = cum** **Taking output = 191 cum**					
		a) Labour					
		Mate	day	0.440	0.440	0.440	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor skilled	day	5.000	5.000	5.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.005			
		(ii) HMP 160 TPH	hour		3.756		
		(iii) HMP 120 TPH	hour			5.008	
		Mechanical broom (2.1m sweeping width)	hour	1.624	1.624	1.624	
		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	3.005			
		(ii) Paver (240HP)	hour		3.756		
		(iii) Paver (174HP)	hour			5.008	
		Electric generator					
		(i) 500 KVA	hour	3.005			
		(ii) 400 KVA	hour		3.756		
		(iii) 250 KVA	hour			5.008	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	4.993			
		(ii) 2.1 Cum Capacity	hour		7.362		
		(iii) 1 Cum Capacity	hour			15.520	
		Tipper					
		For Transportation					
		(i) 18 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) 18 cum capacity	hour	6.010			
		(ii) 14 cum capacity	hour		7.513		
		(iii) 10 cum capacity	hour			10.017	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	16.902	16.902	16.902	
		Pneumatic Tyre roller	hour	2.404	3.005	4.007	
		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			

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

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						

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		MORTH specification clause No. 519 complete in all respects					
		Unit = cum					
		Taking output = 191 cum					
		a) Labour					
		Mate	day	0.520	0.520	0.520	
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	8.000	8.000	8.000	
		Skilled mazdoor for checking line & levels	day	5.000	5.000	5.000	
		b) Machinery					
		Hot in place recycling with Pre heater unit for hot in place recycling	hour	6.000	6.000	6.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	1.200			
		(ii) 2.1 Cum Capacity	hour		1.200		
		(iii) 1 Cum Capacity	hour			1.200	
		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	11.831	11.831	11.831	
		Pnumetic Tyre roller	hour	4.800	4.800	4.800	
		c) Material					
		i) Bitumen@ 5.2 per cent of weight of mix (for 80% recycled material @ 1.5%)	tonne	10.088	10.088	10.088	
		iii) 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 %**					

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			fresh material has been considered)					
			20 - 10 mm 38 percent	cum	21.651	21.651	21.651	
			10 - 5 mm 17 percent	cum	9.686	9.686	9.686	
			5 mm and below 43 percent	cum	24.500	24.500	24.500	
			Filler @ 2 percent of weight of aggregates.	cum	1.709	1.709	1.709	
			* 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)**	**@ 1on (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	0.520	0.520	0.520	
			Mazdoor	day	8.000	8.000	8.000	
			Mazdoor skilled	day	5.000	5.000	5.000	
			b) Machinery					
			Hot in place recycling with Pre heater unit	hour	6.000	6.000	6.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		for hot in place recycling					
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	1.200			
		(ii) 2.1 Cum Capacity	hour		1.200		
		(iii) 1 Cum Capacity	hour			1.200	
		Tipper					
		For Transportation					
		(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	11.831	11.831	11.831	
		Pneumatic Tyre roller	hour	4.800	4.800	4.800	
		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 =	450.760	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	11.94	11.94	11.94	
		10 - 5 mm 17 per cent	cum	9.665	9.665	9.665	
		5 mm and below 60 per cent	cum	34.114	34.114	34.114	
		Filler @ 2 per cent of weight of aggregates.	cum	1.706	1.706	1.706	
		* 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					

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

Note *1. Quantity of Bitumen & Plastic 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. 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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
6.01	*601*	**Dry Lean Cement Concrete Sub-base** 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. **Unit = cum** **Taking output = 450 cum**					
		a) Labour					
		Mate	day	0.360	0.360	0.360	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	7.000	7.000	7.000	
		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) 18 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) 18 cum capacity	hour	4.545			
		(ii) 14 cum capacity	hour		5.500		
		(iii) 10 cum capacity	hour			10.625	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	1.509 x L1 + 7.245			
		(ii) 12 KL capacity	hour		2.013 x L1 + 9.66		
		(iii) 6 KL capacity	hour			4.025 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					

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	0.440	0.440	0.440	
		Mazdoor skilled	day	5.000	5.000	5.000	
		Mazdoor	day	6.000	6.000	6.000	
		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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	3.281 x L1 + 15.75			
		(ii) 12 KL capacity	hour		4.375 x L1 + 21		
		(iii) 6 KL capacity	hour			8.75 x L1 + 42	

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 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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
6.03	*Suggestive*	**Transition Section between Rigid and Flexible Pavement** 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. 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.					
6.04	*Suggestive*	**Cement - Fly ash Dry Lean Cement Concrete Sub- base** 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. **Unit = cum** **Taking output = 450 cum** **a) Labour**					
		Mate	day	0.360	0.360	0.360	
		Mazdoor skilled	day	2.000	2.000	2.000	
		Mazdoor	day	7.000	7.000	7.000	

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) 18 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) 18 cum capacity	hour	4.545			
		(ii) 14 cum capacity	hour		5.500		
		(iii) 10 cum capacity	hour			10.625	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	1.509 x L1 + 7.245			
		(ii) 12 KL capacity	hour		2.013 x L1 + 9.66		
		(iii) 6 KL capacity	hour			4.025 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	

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 205 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	0.440	0.440	0.440	
		Mazdoor skilled	day	5.000	5.000	5.000	
		Mazdoor	day	6.000	6.000	6.000	
		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		

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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	3.281 x L1 + 15.75			
		(ii) 12 KL capacity	hour		4.375 x L1 + 21		
		(iii) 6 KL capacity	hour			8.75 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	

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	0.440	0.440	0.440	
		Mazdoor skilled	day	5.000	5.000	5.000	
		Mazdoor	day	6.000	6.000	6.000	
		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	

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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	1.641 x L1 + 7.875			
		(ii) 12 KL capacity	hour		2.188 x L1 + 10.5		
		(iii) 6 KL capacity	hour			4.375 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	
		Fibre Reinforcement @ 9.25 kg Per Cum.	tonne	4.163	4.163	4.163	

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 tarpaulin, 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 Fly ash 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	0.440	0.440	0.440	
		Mazdoor skilled	day	5.000	5.000	5.000	
		Mazdoor	day	6.000	6.000	6.000	

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 @ 20km/hr and return speed @ 30 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	1.641 x L1 + 7.875			
		(ii) 12 KL capacity	hour		2.188 x L1 + 10.5		
		(iii) 6 KL capacity	hour			4.375 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	

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	
		Fibre 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 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.

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.

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 geocomposite 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	0.030	0.030	0.030	
		Mazdoor skilled	day	0.250	0.250	0.250	
		Mazdoor	day	0.500	0.500	0.500	
		b) Material					
		Geonets, geomembrane and geotextile to make planar geocomposite stable network for sub surface drain including wrapping of joints with 160 mm over lapping with geotextile.					
		Geonets	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 maximize paving fabric contact with pavement surface **Unit = sqm** **Taking output = 2800 cum**					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.800	0.800	0.800	
		Mazdoor	day	20.000	20.000	20.000	
		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	0.080	0.080	0.080	
		Mazdoor skilled	day	0.500	0.500	0.500	
		Mazdoor	day	1.500	1.500	1.500	
		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	

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	0.200	0.200	0.200	
			Mazdoor	day	3.000	3.000	3.000	
			Mazdoor skilled	day	2.000	2.000	2.000	
			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					

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	metre	472.500	472.500	472.500	
		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	metre	472.500	472.500	472.500	
		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	metre	472.500	472.500	472.500	
		or					
		5.Glass reinforced polymer/fibre 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	
Type 1		**1.Galvanised carbon 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 2		**2.Copper Strips**					
		c) Overhead charges		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	

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/fibre 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	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor skilled	day	2.000	2.000	2.000	
		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 panels, overlaps and other protective elements for synthetic geogrids.					

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	0.320	0.320	0.320	
			Mazdoor	day	6.000	6.000	6.000	
			Mazdoor skilled	day	2.000	2.000	2.000	
			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 panels, 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					

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

Note

1. The specification and construction details to be adopted shall be as per section 3100 of MoRT&H Specification.
2. Drainage arrangement shall be made as per approved design and drawings.
3. 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.
4. 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.
5. 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.
6. For compaction of Earthwork, attention is invited to clause 3106.5 of MoRT&H Specification.
7. Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.
8. The type of reinforcing elements to be adopted shall be as per approved design and specifications.
9. The market rate for supply of reinforcing elements and their accessories are to be ascertained from reputed firms in the field of earth reinforcement.
10. 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.
11. 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.
12. The cost of reinforced earth retaining wall shall include following:
    (i) Foundation concrete as per approved design.
    (ii) Cost of facial panels and their erection.
    (iii) Cost of reinforcing elements including their fixing and joining with the facial panels.
    (iv) Drainage arrangement including filter media as per approved design and drawings.
13. The compacted earth filling to be retained shall form part of embankment.
14. Excavation for foundation including backfilling paid separately.
15. 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	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Bi-Axial Extruded GeoGrids 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 panels, 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	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		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 and					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		b) Material					
		Bi-Axial Extruded GeoGrids 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 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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
7.05	703 (iv)	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.					
		Unit = Sqm					
		Taking output = 300 sqm					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		b) Material					
		Bi-Axial Extruded GeoGrids of Minimum Tensile Strength 40 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 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					
7.06	703	Supplying and laying high strength flexible geogrids (HSFG) as soil reinforcement / basal reinforcement as per MORT&H 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 Celsius corresponding to 12 % strain etc.. complete and as directed by Engineer - In - Charge.					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Details of Cost for 300 Sqm					
		Unit = Sqm					
		Taking output = 300 sqm					
		b) Labour					
		Mate	day	0.200	0.200	0.200	
		Beldar	day	3.000	3.000	3.000	
		Skilled Beldar	day	2.000	2.000	2.000	
		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 including taxes and transportation.					
(i)		**c) Overhead charges**		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	

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					
	(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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	(ix)	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					
	(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. Geocomposite for planar drainage, realized by thermobonding a draining core in extruded monofilaments with two filtering nonwoven geotextiles that may also be working as separation or protecting					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		b) Material					
		Geosynthetic Drainage Composite 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.	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)**	
		Cost for 300 sqm = a+b+c+d **Rate per sqm = (a+b+c+d)/300**					
7.08	**704**	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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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. **Unit = Sqm** **Taking output = 300 sqm**					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		b) Material					
		Geosynthetic 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 transpotarion & 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 frication Slab** Provision of an Reinforced cement concrete crash barrier with frication 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 frication slab and (Area-1.032 Sqm. /Meter) Crash Barrier with frication Slab **Unit = Linear meter** **Taking output = 10 m**					

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 frication slab (Rate taken from items 12.08 B Case-II including OH & CP)	cum	0.550	0.550	0.550	
		RCC M 40 grade concrete (Area-1.032 Sqm. /Meter) (Rate taken from items 14.01 E Case-II including OH & CP)	cum	10.320	10.320	10.320	
		b) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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/mm^2 and tensile strength > 800N/mm^2 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	0.360	0.360	0.360	
		Skilled Mazdoor	day	1.000	1.000	1.000	
		Semi Skilled Mazdoor	day	2.000	2.000	2.000	
		Highly Skilled	day	4.000	4.000	4.000	
		Driller	day	1.000	1.000	1.000	
		Operator (Grouting)	day	1.000	1.000	1.000	

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 for10m = 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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.030	0.030	0.030	
		Mazdoor	day	0.400	0.400	0.400	
		Mazdoor (Skilled)	day	0.352	0.352	0.352	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.022	0.022	0.022	
		Mazdoor	day	0.300	0.300	0.300	
		Mazdoor (Skilled)	day	0.242	0.242	0.242	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	hour	5.600	5.600	5.600	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		installation and removal of 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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.017	0.017	0.017	
		Mazdoor	day	0.240	0.240	0.240	
		Mazdoor (Skilled)	day	0.176	0.176	0.176	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	16.480	16.480	16.480	
		Core tube (drilling bit)	Nos	0.416	0.416	0.416	
		Core tube (drilling pipe)	Nos	0.224	0.224	0.224	

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	5.590	5.590	5.590	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 = 20meter					
		a) Labour					
		For boring work					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.020	0.020	0.020	
		Mazdoor	day	0.280	0.280	0.280	
		Mazdoor (Skilled)	day	0.220	0.220	0.220	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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)**	
		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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.026	0.026	0.026	
		Mazdoor	day	0.347	0.347	0.347	
		Mazdoor (Skilled)	day	0.294	0.294	0.294	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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					
		B Gravelly Soil					
		Taking output = 18.3 meter					
		a) Labour					
		For boring work					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.019	0.019	0.019	
		Mazdoor	day	0.263	0.263	0.263	
		Mazdoor (Skilled)	day	0.201	0.201	0.201	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.014	0.014	0.014	
		Mazdoor	day	0.213	0.213	0.213	
		Mazdoor (Skilled)	day	0.146	0.146	0.146	

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	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.017	0.017	0.017	
		Mazdoor	day	0.247	0.247	0.247	
		Mazdoor (Skilled)	day	0.184	0.184	0.184	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	

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	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	0.940	0.940	0.940	
		Mazdoor (Skilled)	day	0.264	0.264	0.264	

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	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.043	0.043	0.043	
		Mazdoor	day	0.880	0.880	0.880	
		Mazdoor (Skilled)	day	0.198	0.198	0.198	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	

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	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	0.840	0.840	0.840	
		Mazdoor (Skilled)	day	0.154	0.154	0.154	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.042	0.042	0.042	
		Mazdoor	day	0.870	0.870	0.870	
		Mazdoor (Skilled)	day	0.187	0.187	0.187	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.045	0.045	0.045	
		Mazdoor	day	0.900	0.900	0.900	
		Mazdoor (Skilled)	day	0.220	0.220	0.220	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.041	0.041	0.041	
		Mazdoor	day	0.850	0.850	0.850	
		Mazdoor (Skilled)	day	0.165	0.165	0.165	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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)**	

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.038	0.038	0.038	
		Mazdoor	day	0.817	0.817	0.817	
		Mazdoor (Skilled)	day	0.129	0.129	0.129	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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					

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	0.842	0.842	0.842	
		Mazdoor (Skilled)	day	0.156	0.156	0.156	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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)**	
		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					

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.020	0.020	0.020	
		Mazdoor	day	0.270	0.270	0.270	
		Mazdoor (Skilled)	day	0.220	0.220	0.220	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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					

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.015	0.015	0.015	
		Mazdoor	day	0.220	0.220	0.220	
		Mazdoor (Skilled)	day	0.165	0.165	0.165	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For installation of pipe material					
		Mate	day	0.014	0.014	0.014	
		Mazdoor	day	0.200	0.200	0.200	
		Mazdoor (Skilled)	day	0.143	0.143	0.143	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.015	0.015	0.015	
		Mazdoor	day	0.220	0.220	0.220	
		Mazdoor (Skilled)	day	0.165	0.165	0.165	

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	0.176	0.176	0.176	
		Mazdoor	day	2.600	2.600	2.600	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.017	0.017	0.017	
		Mazdoor	day	0.230	0.230	0.230	
		Mazdoor (Skilled)	day	0.184	0.184	0.184	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.184	0.184	0.184	
		Mazdoor	day	2.800	2.800	2.800	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.013	0.013	0.013	
		Mazdoor	day	0.188	0.188	0.188	
		Mazdoor (Skilled)	day	0.138	0.138	0.138	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.184	0.184	0.184	
		Mazdoor	day	2.800	2.800	2.800	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	

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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.012	0.012	0.012	
		Mazdoor	day	0.171	0.171	0.171	
		Mazdoor (Skilled)	day	0.119	0.119	0.119	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.184	0.184	0.184	
		Mazdoor	day	2.800	2.800	2.800	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	

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)-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	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		For installation of pipe material					
		Mate	day	0.013	0.013	0.013	
		Mazdoor	day	0.188	0.188	0.188	
		Mazdoor (Skilled)	day	0.138	0.138	0.138	
		For both installation and removal of machinery and equipment of boring works					
		Mate	day	0.184	0.184	0.184	
		Mazdoor	day	2.800	2.800	2.800	
		Mazdoor (Skilled)	day	1.800	1.800	1.800	
		For installation and removal of temporary stage in flat terrain					
		Mate	day	0.364	0.364	0.364	
		Mazdoor	day	5.700	5.700	5.700	
		Mazdoor (Skilled)	day	3.400	3.400	3.400	
		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	

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	0.080	0.080	0.080	
		Mazdoor skilled	day	1.000	1.000	1.000	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Motor Grader					
		(i) Motor grader 4.30 metre blade	hour	1.210			
		(ii) Motor grader 3.70 metre blade	hour		1.459		
		(iii) Motor grader 3.35 metre blade	hour			1.627	
		Vibratory roller	hour	1.214	1.214	1.214	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 3.0 Km/hr.)					
		(i) 16 KL capacity	hour	0.292 x L1 + 0.467			
		(ii) 12 KL capacity	hour		0.389 x L1 + 0.622		
		(iii) 6 KL capacity	hour			0.778 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					

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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Motor grader for grading					
		(i) Motor grader 4.30 metre blade	hour	2.177			
		(ii) Motor grader 3.70 metre blade	hour		2.626		
		(iii) Motor grader 3.35 metre blade	hour			2.929	
		Water tanker (speed @ Water tanker speed km/hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.25 x L1 + 0.864			
		(ii) 12 KL capacity	hour		0.333 x L1 + 1.152		
		(iii) 6 KL capacity	hour			0.667 x L1 + 2.304	
		Vibratory roller	hour	2.184	2.184	2.184	
		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 MoRT&H 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	0.320	0.320	0.320	
		Mazdoor for filling, watering, ramming etc.	day	7.000	7.000	7.000	

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Mazdoor (Skilled)	day	1.000	1.000	1.000	
			b) Material					
			Filter media of stone aggregate conforming to clause 2504.2.2. of MoRT&H 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					
7.16	**704**		**Supplying & laying of drainage composite for use behind walls with Geosynthetic 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 planar 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	0.200	0.200	0.200	
			Mazdoor	day	3.000	3.000	3.000	
			Mazdoor (Skilled)	day	2.000	2.000	2.000	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material					
		Geosynthetic 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					
7.16	**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 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.					
		Unit = Sqm					
		Taking output = 300 sqm					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		b) Material					
		Geosynthetic 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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
7.17	**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	0.060	0.060	0.060	
		Mazdoor for preparation of ground and laying of the Geocell	day	1.000	1.000	1.000	
		Skilled Mazdoor		0.500	0.500	0.500	
		b) 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.					
		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:-	Soil filling/ spreading, turfing/seeding paid separately, refer chapter-03 for details.					
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,					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.060	0.060	0.060	
		Mazdoor for preparation of ground and laying of the Geocell	day	1.000	1.000	1.000	
		Skilled Mazdoor		0.500	0.500	0.500	
		b) 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.					
		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:-	Soil filling/ spreading , turfing/seeding paid separately ,refer chapter-03 for details.					
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	0.060	0.060	0.060	
		Mazdoor for preparation of ground and laying of the Geocell	day	1.000	1.000	1.000	
		Skilled Mazdoor		0.500	0.500	0.500	
		b) Material					
		Natural geotextile	Sqm	100.000	100.000	100.000	
		Add 10 per cent of the cost of natural geotextile for wastage, overlaps and					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		accessories for anchoring with the ground, other protective elements for natural geotextile and other miscelleneus activities required to complete the item in all respect including transpotarion & 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 100 sqm = a+b+c+d **Rate per sqm = (a+b+c+d)/100**					

Note:- Soil filling/ spreading , turfing/seeding paid separately ,refer chapter-03 for details.

CHAPTER – 8

TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES

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 aluminum 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

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.

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 metre** ***Using Concrete Batching and Mixing Plant***					
		(i) **PCC M15 for Kerb base**					
		Total Concrete =	11.610	Cum.			
		a) Labour					
		Mate	day	0.240	0.240	0.240	
		Mason	day	2.000	2.000	2.000	
		Mazdoor	day	4.000	4.000	4.000	
		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 @ 20 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.011 x L1 + 0.12			
		(ii) 12 KL capacity	hour		0.015 x L1 + 0.12		
		(iii) 6 KL capacity	hour			0.03 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.			

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		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 @ 20 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.042 x L1 + 0.12			
		(ii) 12 KL capacity	hour		0.056 x L1 + 0.12		
		(iii) 6 KL capacity	hour			0.113 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 metre					
		Total Concrete =	9.675	Cum.			
		Using Concrete Batching and Mixing Plant					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) PCC M15 for Kerb base					
		Total Concrete =	9.675	Cum.			
		a) Labour					
		Mate	day	0.240	0.240	0.240	
		Mason	day	2.000	2.000	2.000	
		Mazdoor	day	4.000	4.000	4.000	
		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 @ 20 km/hr and spreading speed @ 3.0 Km/hr)					
		(i) 16 KL capacity	hour	0.009 x L1 + 0.1			
		(ii) 12 KL capacity	hour		0.012 x L1 + 0.1		
		(iii) 6 KL capacity	hour			0.025 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 =	15.000	Cum.			
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		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 @ 20 km/hr and spreading speed @ 3.0 Km/hr.)					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.05 x L1 + 0.1			
		(ii) 12 KL capacity	hour		0.067 x L1 + 0.1		
		(iii) 6 KL capacity	hour			0.134 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					
	(i)	**Hindi** (Matras 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=1600.00 Cm.					
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Painter	day	2.000	2.000	2.000	
		Mazdoor	day	1.000	1.000	1.000	
		b) Material					
		Paint	Litre	0.700	0.700	0.700	
		Per Cm. Basic Cost of Labour & Material (a+b)		***1.339***	***1.339***	***1.339***	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = per cm height per letter					
		Taking Output=1600.00 Cm.					
		a) Labour					
		Mate	day	0.070	0.070	0.070	
		Painter Ist class	day	1.250	1.250	1.250	
		Mazdoor	day	0.500	0.500	0.500	
		b) Material					
		Paint	Litre	0.500	0.500	0.500	
		Per Cm. Basic Cost of Labour & Material (a+b)		***0.802***	***0.802***	***0.802***	
		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 Aluminum 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					

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

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		or					
	(x)	80 mm x 60 mm rectangular Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.480	0.480	0.480	
		or					
	(xi)	60 cm x 50 cm rectangular Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.300	0.300	0.300	
		or					
	(xii)	60 cm x 45 cm rectangular Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.270	0.270	0.270	
		or					
	(xiii)	60 cm x 60 cm square Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.360	0.360	0.360	
		or					
	(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)					

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)	

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)					
		(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,					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		3mm/4mm thick Aluminum 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	
		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	sqm	0.624	0.624	0.624	
		Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.					
		or					
		(ii) 90 cm equilateral triangle	sqm	0.351	0.351	0.351	
		Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.					
		or					
		(iii) 75 cm equilateral triangle	sqm	0.244	0.244	0.244	
		Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.					
		or					

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.	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					
	(x)	80 mm x 60 mm rectangular Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.480	0.480	0.480	
		or					
	(xi)	60 cm x 50 cm rectangular Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.300	0.300	0.300	
		or					
	(xii)	60 cm x 45 cm rectangular Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.270	0.270	0.270	
		or					
	(xiii)	60 cm x 60 cm square Add 1 percent of cost material (b) towards cost of drilling holes, nuts, bolts etc.	sqm	0.360	0.360	0.360	
		or					

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)					

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)	

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 Aluminum 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**					

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	0.008	0.008	0.008	
		Mazdoor	day	0.200	0.200	0.200	
		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 Aluminum composite material sheet with overall thickness of 4 mm with area exceeding 0.9 sqm fixed over back support frame of min 40 x 40					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.012	0.012	0.012	
		Mazdoor	day	0.300	0.300	0.300	
		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 1.5 sqm =i+ii+ii+ a+b+c+d+e					
		Rate per sqm (for sign having area more than 0.9 sqm) = (i+ii+iii+a+b+c+d+e)/1.50					

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.

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	0.240	0.240	0.240	
		Blacksmith	day	2.000	2.000	2.000	
		Mazdoor including for handling & fixing at site.	day	4.000	4.000	4.000	
		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	0.010	0.010	0.010	
		Blacksmith	day	0.100	0.100	0.100	
		Mazdoor	day	0.150	0.150	0.150	
		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	

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 1. 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. 2. 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	0.120	0.120	0.120	
		Painter	day	2.000	2.000	2.000	
		Mazdoor	day	1.000	1.000	1.000	
		b) Material					
		Paint conforming to requirement of clause 803.3.	Litre	6.000	6.000	6.000	
		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**					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.09	803	**Painting on Steel Surfaces** 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 **Unit = sqm** **Taking output = 10 sqm**					
		a) Labour					
		Mate	day	0.028	0.028	0.028	
		Painter	day	0.450	0.450	0.450	
		Mazdoor	day	0.250	0.250	0.250	
		b) Material					
		Paint ready mixed approved brand.	Litre	1.250	1.250	1.250	
		Add @ 1 percent on cost of material for scaffolding					
		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 10 sqm = a+b+c+d **Rate per sqm= (a+b+c+d)/10**					
8.10	803	**Painting on Wood Surfaces** Providing and applying two coats of ready mix paint of approved brand on wood surface after thorough cleaning of surface to give an even shade **Unit = sqm** **Taking output = 10 sqm**					
		a) Labour					
		Mate	day	0.028	0.028	0.028	
		Painter	day	0.500	0.500	0.500	
		Mazdoor	day	0.200	0.200	0.200	
		b) Material					
		Paint ready mixed of approved brand.	Litre	1.500	1.500	1.500	
		Add @ 1 percent on cost of material for scaffolding					
		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.					

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					
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	0.084	0.084	0.084	
		Painter	day	0.550	0.550	0.550	
		Mazdoor	day	1.550	1.550	1.550	
		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	0.068	0.068	0.068	
		Painter	day	0.350	0.350	0.350	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.12	803	**Painting Lines, Dashes, Arrows etc. on Roads in Two Coats on Old Work** Painting lines, dashes, arrows etc. on 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	0.062	0.062	0.062	
		Painter Ist class	day	0.300	0.300	0.300	
		Mazdoor	day	1.250	1.250	1.250	
		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	0.068	0.068	0.068	
		Painter Ist class	day	0.350	0.350	0.350	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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.					
		Unit = sqm					
		Taking output = 600 sqm					
		a) Labour					
		Mate	day	0.030	0.030	0.030	
		Mazdoor	day	0.750	0.750	0.750	
		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	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 from item No. 8.03 including OH & CP)	per cm per letter	1800.000	1800.000	1800.000	
		Transportation and fixing					
		f) Labour					
		Mate	day	0.264	0.264	0.264	
		Mason	day	0.600	0.600	0.600	
		Mazdoor including loading/unloading	day	6.000	6.000	6.000	
		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 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	0.320	0.320	0.320	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	7.000	7.000	7.000	
		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 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	0.340	0.340	0.340	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	7.000	7.000	7.000	
		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.

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 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	0.040	0.040	0.040	
		Mazdoor for fixing	day	1.000	1.000	1.000	
		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	
		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	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	
		Transportation and fixing					
		e) Labour					
		Mate	day	0.570	0.570	0.570	
		Mazdoor	day	14.250	14.250	14.250	
		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 strutted 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	0.090	0.090	0.090	
		Blacksmith	day	0.250	0.250	0.250	
		Mazdoor	day	2.000	2.000	2.000	
		b) Material					
		Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	31.420	31.420	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 exposed surface of angle iron posts (Rate as per item no. 8.08)	sqm	2.110	2.110	2.110	
		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 strutted 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	0.116	0.116	0.116	
		Blacksmith	day	0.400	0.400	0.400	
		Mazdoor	day	2.500	2.500	2.500	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
	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 strutted, 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	0.120	0.120	0.120	
		Welder	day	1.000	1.000	1.000	
		Mazdoor	day	2.000	2.000	2.000	
		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	
		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	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Painting					
		Painting two coats Including priming	sqm	8.000	8.000	8.000	
		e) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ on (a+b+c)**	
		f) Contractor's profit		**@ on (a+b+c+e)**	**@ on (a+b+c+e)**	**@ on (a+b+c+e)**	
		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.					
		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	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		Plumber	day	0.010	0.010	0.010	
		b) Material					
		Steel pipe 50 mm external dia as per IS:1239	metre	30.000	30.000	30.000	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
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 posts1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to, 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	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		Plumber	day	0.010	0.010	0.010	
		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)**	

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 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 crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with Reinforced Cement Concrete with HYSD reinforcement conforming to conforming MoRT&H Specification 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)					
			Unit = Linear metre					
			Taking output = 20 m					
	A	**(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)	cum	4.860	4.860	4.860	
			HYSD steel reinforcement including dowel bars	tonne	0.194	0.194	0.194	
			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	0.250	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					
8.22	**A**	**(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)	cum	4.860	4.860	4.860	
			HYSD steel reinforcement	tonne	0.194	0.194	0.194	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		including dowel bars					
		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	0.250	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 30 may be taken from chapter-12 on foundation.

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)	cum	5.220	5.220	5.220	
		HYSD steel reinforcement including dowel bars	tonne	0.209	0.209	0.209	
		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	0.250	0.250	0.250	
		d) Overhead charges		**@ on (b+c)**	**@ on (b+c)**	**@ on (b+c)**	
		e) Contractor's profit		**@ on**	**@ on**	**@ on**	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
				(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 25 may be taken from chapter-12 on foundation.					
8.22	B	(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)	cum	5.220	5.220	5.220	
		HYSD steel reinforcement including dowel bars	tonne	0.209	0.209	0.209	
		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	0.250	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 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**					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 4.5 metre length					
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Blacksmith	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		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.)					
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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	0.060	0.060	0.060	
		Blacksmith	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	

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

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.

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = Running metre					
		Taking output = 15 metre					
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	2.000	2.000	2.000	
		Blacksmith	day	1.000	1.000	1.000	
		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					
		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 envoirenment 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

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		and rectangular vans 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	0.004	0.004	0.004	
		Mazdoor	day	0.100	0.100	0.100	
		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	
		iii) MS sheet for 250 mm dia circular vane 3 mm thick,4 numbers @ 24 kg/sqm	kg	4.800	4.800	4.800	
		Add 5 percent cost of material for fabrication, welding, bending, nuts, bolts etc.					
		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 450 to the direction of flow of traffic, 1.5 m center to center, top edge of the					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.004	0.004	0.004	
		Mazdoor	day	0.100	0.100	0.100	
		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	
		e) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ on (a+b+c)**	
		f) Contractor's profit		**@ on (a+b+c+e)**	**@ on (a+b+c+e)**	**@ on (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	0.030	0.030	0.030	
		Mazdoor	day	0.500	0.500	0.500	
		Electrician	day	0.250	0.250	0.250	
		b) Material					
		i) Steel circular hollow pole of standard specification for	each	1.000	1.000	1.000	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		street lighting to mount light at 10 m height above road level					
		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	
		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 (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 light for fixing in Median= a+b+c+d+e					
	(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	0.024	0.024	0.024	
		Mazdoor	day	0.400	0.400	0.400	
		Electrician	day	0.200	0.200	0.200	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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)**	
		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 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 = 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	2.360	2.360	2.360	
		b) 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	
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	20.000	20.000	20.000	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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.15.05B)	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 = 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)**	cum	3.370	3.370	3.370	
		b) Labour					
		Mate	day	0.090	0.090	0.090	
		Mazdoor	day	2.000	2.000	2.000	
		Mazdoor skilled	day	0.250	0.250	0.250	
		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	cum	4.380	4.380	4.380	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(Rate taken from item No. 15.07 B including OH & CP)					
		b) Labour					
		Mate	day	0.160	0.160	0.160	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor skilled	day	1.000	1.000	1.000	
		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.					
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 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	0.120	0.120	0.120	
		Mazdoor	day	2.000	2.000	2.000	
		Blacksmith	day	1.000	1.000	1.000	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 specilised commercial product and the lumpsum 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 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	0.070	0.070	0.070	
		Mazdoor	day	1.500	1.500	1.500	
		Blacksmith	day	0.250	0.250	0.250	
		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**					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 with20 mm steel wire rope as per approved design and drawings **Unit = sqm** **Taking output = 20 sqm**					
		a) Labour					
		Mate	day	0.130	0.130	0.130	
		Mazdoor	day	3.000	3.000	3.000	
		Blacksmith	day	0.250	0.250	0.250	
		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)**	
		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 patentend 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	0.100	0.100	0.100	
		Mazdoor	day	2.500	2.500	2.500	

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

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Unit = Nos					
		Taking output = 50 Nos					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		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	
		Add 10 percent of cost of material for fixing and 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 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					
		Unit = Running metre					
		Taking output = 68 Nos.					
		a) Labour					
		Mate	day	0.020	0.020	0.020	
		Mazdoor	day	0.500	0.500	0.500	
		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					

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

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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				
		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	0.090	0.090	0.090	
		Mazdoor	day	1.000	1.000	1.000	
		Blacksmith (Ist class)	day	1.000	1.000	1.000	
		Welder	day	0.250	0.250	0.250	
		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)**	
		e) Contractor's profit		**@ on (a+b+c+d)**	**@ on (a+b+c+d)**	**@ on (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					

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

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

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55 **Unit = each** **Taking output = one steel portable barricade**					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	0.250	0.250	0.250	
		Painter	day	0.500	0.500	0.500	
		Welder	day	0.250	0.250	0.250	
		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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 of450, complete as per IRC:SP:55					
		Unit = each					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	0.300	0.300	0.300	
		Painter	day	0.600	0.600	0.600	
		Welder	day	0.300	0.300	0.300	
		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)**	
		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 of450, complete as per IRC:SP:55					
		Unit = each					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mazdoor	day	0.300	0.300	0.300	
		Painter	day	0.600	0.600	0.600	
		Carpenter	day	0.600	0.600	0.600	
		b) Material					
		Timber	cum	0.180	0.180	0.180	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.240	0.240	0.240	
		Mazdoor	day	3.000	3.000	3.000	
		Painter	day	1.000	1.000	1.000	
		Mason	day	2.000	2.000	2.000	
		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)**	
		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	0.020	0.020	0.020	
		Mazdoor	day	0.250	0.250	0.250	
		Painter	day	0.250	0.250	0.250	
		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	

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					
8.46	**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 reboubdable work zone sheeting as per ASTM D 4956 S2. **Unit = each** **Taking output = one drum delineator**					
		a) Labour					
		Mate	day	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		b) Material					
		Water Filled Barricades Work zone sheeting	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					
8.47	**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	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		b) Material					
		Tubular Marker/ Spring post 450 mm	each	1.000	1.000	1.000	

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					
8.48	**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	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		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					
8.49	**suggestive**	**Flagman** 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 **Unit = each** **Taking output = one flagman**					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Material					
		Flag of red color cloth 600 x 600 mm	each	1.000	1.000	1.000	
		Wooden staff for fastening of flag 25 mm dia, one m long	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 flagman = a+b+c+d					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
8.50	816	**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.					
	A	**Traffic Management Command Centre Equipment**					
		Material					
	A1	Control Centre Server	Nos.	1.000	1.000	1.000	
	A2	Hot Standby Backup Server	Nos.	1.000	1.000	1.000	
	A3	NAS Video Server with storage Minimum 70 TB	Nos.	1.000	1.000	1.000	
	A4	Backup Video (Only Incidents) Server	Nos.	1.000	1.000	1.000	
	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 Ope rator 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	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	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**					
	C1	PTZ Camera (including CCTV Controller)	Set	1.000	1.000	1.000	
	C2	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)**					
	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	
		Steel fence for protection	Set	1.000	1.000	1.000	

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	I	**Digital Transmission System (DTS)**					
	I1	24 Core Armored 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 from item No. 12.11 A (iii) Case II including OH & CP)	cum	4.860	4.860	4.860	
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		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.					
	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					

Sr No	Ref.to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
	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.

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	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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	0.180	0.180	0.180
			Mazdoor	day	4.500	4.500	4.500
			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.

9.01	A	(iii)	**Depth above 6 m**				
			a) Labour				
			Mate/Supervisor	day	0.240	0.240	0.240
			Mazdoor	day	6.000	6.000	6.000
			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				

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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.					
9.01	B (i)	**Mechanical Means (Depth upto 3 m)** **Unit = cum** **Taking output = 330 cum**					
		a) Labour					
		Mate	day	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	4.627			
		(ii) 1.1 cum bucket capacity	hour		5.329		
		(iii) 0.9 cum bucket capacity	hour			7.450	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	2.776			
		(ii) 1.1 cum bucket capacity	hour		3.197		
		(iii) 0.9 cum bucket capacity	hour			4.470	
		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	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					

Sr No	Ref. to M		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			(i) 1.2 cum bucket capacity	hour	4.674			
			(ii) 1.1 cum bucket capacity	hour		5.383		
			(iii) 0.9 cum bucket capacity	hour			7.525	
			For backfilling (considering 60% of the excavated material)					
			(i) 1.2 cum bucket capacity	hour	2.804			
			(ii) 1.1 cum bucket capacity	hour		3.230		
			(iii) 0.9 cum bucket capacity	hour			4.515	
			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	0.320	0.320	0.320	
			Mazdoor	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			For excavation					
			(i) 1.2 cum bucket capacity	hour	4.732			
			(ii) 1.1 cum bucket capacity	hour		5.450		
			(iii) 0.9 cum bucket capacity	hour			7.619	
			For backfilling (considering 60% of the excavated material)					
			(i) 1.2 cum bucket capacity	hour	2.839			
			(ii) 1.1 cum bucket capacity	hour		3.270		

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 0.9 cum bucket capacity	hour			4.571	
		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	0.200	0.200	0.200	
		Mazdoor	day	5.000	5.000	5.000	
		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.					
9.01	**B**	**Mechanical Means**					
		Unit = cum					
		Taking output = 50 cum					
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		b) Machinery					
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	5.818			
		(ii) 1.1 cum bucket capacity	hour		6.845		
		(iii) 0.9 cum bucket capacity	hour			7.273	

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	0.872			
			(ii) 1.1 cum bucket capacity	hour		1.005		
			(iii) 0.9 cum bucket capacity	hour			1.405	
			Jack Hammer	hour	5.818	6.845	7.273	
			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	0.872			
			(ii) 14 cum capacity	hour		1.005		
			(iii) 10 cum capacity	hour			1.405	
			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	**301 & 302**	**III**	**Hard Rock (requiring blasting)**					
		A	**Manual Means**					
			Unit = cum					
			Taking output = 10 cum					
			a) Labour					
			Mate	day	0.350	0.350	0.350	
			Driller	day	0.500	0.500	0.500	
			Blaster	day	0.250	0.250	0.250	
			Mazdoor	day	8.000	8.000	8.000	
			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.

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	0.210	0.210	0.210	
			Mazdoor	day	3.000	3.000	3.000	
			Driller	day	2.000	2.000	2.000	
			Blaster	day	0.250	0.250	0.250	
			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	1.024	1.024	1.024	
			Hydraulic Excavator					
			Excavator for excavation					
			(i) 1.2 cum bucket capacity	hour	1.024			
			(ii) 1.1 cum bucket capacity	hour		1.024		
			(iii) 0.9 cum bucket capacity	hour			1.024	
			For loading					
			(i) 1.2 cum bucket capacity	hour	2.094			
			(ii) 1.1 cum bucket capacity	hour		2.411		
			(iii) 0.9 cum bucket capacity	hour			3.371	
			Tipper					
			For transportation considering lead @ 1 km					
			(i) 18 cum capacity	t-km	180.000			
			(ii) 14 cum capacity	t-km		180.000		

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity	t-km			180.000	
		For loading & unloading time					
		(i) 18 cum capacity	hour	2.094			
		(ii) 14 cum capacity	hour		2.411		
		(iii) 10 cum capacity	hour			3.371	
		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	**IV**	**Hard Rock (blasting prohibited)**					
		Unit = cum					
		Taking output = 35 cum					
	A	**Mechanical Means**					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Jack Hammer	hour	5.973	7.467	9.190	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	5.973			
		(ii) 1.1 cum bucket capacity	hour		7.467		
		(iii) 0.9 cum bucket capacity	hour			9.190	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.611			

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		0.703		
		(iii) 0.9 cum bucket capacity	hour			0.983	
		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	0.611			
		(ii) 14 cum capacity	hour		0.703		
		(iii) 10 cum capacity	hour			0.983	
		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	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	8.506			
		(ii) 1.1 cum bucket capacity	hour		9.796		
		(iii) 0.9 cum bucket capacity	hour			13.695	
		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	8.506			
		(ii) 14 cum capacity	hour		9.796		
		(iii) 10 cum capacity	hour			13.695	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Water tanker (speed @ Water tanker speed km/ hr and return speed @ 20 km/hr and spreading speed @ 2.5 Km/hr.)					
		(i) 16 KL capacity	hour	0.125 x L1 + 0.16			
		(ii) 12 KL capacity	hour		0.167 x L1 + 0.213		
		(iii) 6 KL capacity	hour			0.333 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)**	

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	0.320	0.320	0.320	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	7.000	7.000	7.000	
		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	0.023 x L1 + 0.135			
		(ii) 12 KL capacity	hour		0.03 x L1 + 0.18		
		(iii) 6 KL capacity	hour			0.06 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.					
9.04	**2900**	**Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Single Row.**					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Laying Reinforced cement concrete pipe NP4/ prestressed 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	0.100	0.100	0.100	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	2.000	2.000	2.000	
		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 /prestressed 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	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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	0.160	0.160	0.160	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		b) Material					
		Sand at site	cum	0.090	0.090	0.090	
		Cement at site	tonne	0.070	0.070	0.070	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		RCC pipe NP-4/prestressed 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	0.160	0.160	0.160	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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/prestressed 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

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 / Prestressed Concrete Pipe on First Class Bedding in Double Row.**					
		Laying Reinforced cement concrete pipe NP4 / prestressed 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	0.200	0.200	0.200	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	4.000	4.000	4.000	
		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/prestressed 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	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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

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	0.320	0.320	0.320	
		Mason	day	2.000	2.000	2.000	
		Mazdoor	day	6.000	6.000	6.000	
		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 /prestressed 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	0.320	0.320	0.320	
		Mason	day	2.000	2.000	2.000	
		Mazdoor	day	6.000	6.000	6.000	
		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 /prestressed 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	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ on (a+b+c)**	

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 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**	**PCC Grade M15**					
		Case I	**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	0.113	0.113	0.113	
			Mason	day	1.500	1.500	1.500	
			Mazdoor	day	1.325	1.325	1.325	
			c) Machinery					
			Transit truck agitator					
			For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
			For unloading	hour	0.650	0.650	0.650	
			Hydraulic Boom **placer pump**	hour	0.650	0.650	0.650	
			Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
			(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
			(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
			(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	
			d) Formwork @ 10 percent on cost of concrete i.e. cost of material, labour and machinery					

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, transit mixer & 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					
		Mate	day	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					

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 (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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ km/hr and return speed @ km/hr and 30 mins					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	

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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					

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**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	t.-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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**					
		Unit = cum					
		Taking output = 15 cum					

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 21.07)	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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	9.000	9.000	9.000	
		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	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	

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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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+d)**	**@ on (a+b+c+d)**	**@ on (a+b+c+d)**	
		e) Contractor's profit		**@ on (a+b+c+d+e)**	**@ on (a+b+c+d+e)**	**@ on (a+b+c+d+e)**	
		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.

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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.007			
		(ii) 1.1 cum bucket capacity	hour		0.008		
		(iii) 0.9 cum bucket capacity	hour			0.012	
		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	0.007			
		(ii) 14 cum capacity	hour		0.008		
		(iii) 10 cum capacity	hour			0.012	
		Plate compactor	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 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					

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	0.180	0.180	0.180	
		Mazdoor	day	4.500	4.500	4.500	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	0.011			
		(ii) 1.1 cum bucket capacity	hour		0.012		
		(iii) 0.9 cum bucket capacity	hour			0.017	
		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	0.011			
		(ii) 14 cum capacity	hour		0.012		
		(iii) 10 cum capacity	hour			0.017	
		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					

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	0.100	0.100	0.100	
		Mazdoor	day	2.500	2.500	2.500	
		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	3.760	3.760	3.760	
		Mazdoor	Day	90.000	90.000	90.000	
		Mazdoor skilled	Day	4.000	4.000	4.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	2.700			
		(ii) HMP 160 TPH	hour		3.375		
		(iii) HMP 120 TPH	hour			4.500	
		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	2.700			
		(ii) 400 KVA	hour		3.375		

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 250 KVA	hour			4.500	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	2.700			
		(ii) 2.1 Cum Capacity	hour		3.375		
		(iii) 1 Cum Capacity	hour			4.500	
		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	2.700			
		(ii) 14 cum capacity	hour		3.375		
		(iii) 10 cum capacity	hour			4.500	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	14.512	14.512	14.512	
		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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		clause 3004.2					
		Unit = Sqm					
		Taking output = 4900 sqm					
		a) Labour					
		Mate	Day	2.920	2.920	2.920	
		Mazdoor	Day	70.000	70.000	70.000	
		Mazdoor skilled	Day	3.000	3.000	3.000	
		b) Machinery					
		Hot Mix Plant					
		(i) HMP 200 TPH	hour	3.000			
		(ii) HMP 160 TPH	hour		3.750		
		(iii) HMP 120 TPH	hour			5.000	
		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	3.000			
		(ii) 400 KVA	hour		3.750		
		(iii) 250 KVA	hour			5.000	
		Front end loader for feeding the plant					
		(i) 3.1 Cum Capacity	hour	3.000			
		(ii) 2.1 Cum Capacity	hour		3.750		
		(iii) 1 Cum Capacity	hour			5.000	
		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	3.000			
		(ii) 14 cum capacity	hour		3.750		
		(iii) 10 cum capacity	hour			5.000	
		Smooth steel wheeled tandem roller for static and vibratory passages	hour	13.875	13.875	13.875	
		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					

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			wastage					
			or					
			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	0.040	0.040	0.040	
			Mazdoor	day	1.000	1.000	1.000	
			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 500sqm = a+b+c+d					
			Rate per meter = (a+b+c+d+e)/500					

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	0.080	0.080	0.080	
			Mazdoor	day	2.000	2.000	2.000	
			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 3500sqm = 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				
			The above mentioned items have already been included in chapter 5.					

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	0.040	0.040	0.040	
		Mazdoor	day	0.500	0.500	0.500	
		Chiseller	day	0.500	0.500	0.500	
		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	0.020	0.020	0.020	
		Mazdoor	day	0.500	0.500	0.500	
		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**					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.11		**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 (a+b)**	**@ on (a+b)**	**@ on (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 bull-dozer 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 (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 **Rate per cum = (a+b+c+d)/100**					
	Note	Land Slide clearance involves pushing of loose earth slided 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					

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 Gelatin 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**	**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	
		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.					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.15	**3000**	**Snow Clearance on Roads with Snow Blowers** Snow clearance from road surface by a snow blower and disposing on the valley side. **Unit = cum** **Taking output = 3600 cum**					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Snow blower equipment 175 HP @ 600 cum per hour	hour	6.000	6.000	6.000	
		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 3600 cum (a+b+c+d) **Rate per cum = (a+b+c+d)/3600**					
10.16	**811**	**Replacement of Metal Beam Crash Barrier**					
	A	**Type - A, "W" : Metal Beam Crash Barrier** Replacement of "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	0.060	0.060	
		Blacksmith	day	0.500	0.500	0.500	
		Mazdoor	day	1.500	1.000	1.000	
		b) Machinery					
		Tractor-trolley	hour	0.100	0.100	0.100	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
10.16	**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 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	0.500	0.500	0.500	
		Mazdoor	day	1.500	1.500	1.500	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 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	0.360	0.360	0.360	
		Mazdoor (skilled)	day	9.000	9.000	9.000	
		b) Machinery					
		Network Survey Vehicle (NSV)	hour	8.000	8.000	8.000	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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)**	**@ on (a+b)**	**@ on (a+b)**	
		d) Contractor's profit		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ on (a+b+c)**	
		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	0.120	0.120	0.120	
		Mazdoor (skilled)	day	1.000	1.000	1.000	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Falling weight deflectometer (FWD) Equipment	hour	8.000	8.000	8.000	
		Falling weight deflectometer (FWD) Equipment 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)**	**@ on (a+b)**	**@ on (a+b)**	
		d) Contractor's profit		**@ on (a+b+c)**	**@ on (a+b+c)**	**@ on (a+b+c)**	
		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 consider					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
10.19		**Road Retro reflectometer attached with SUV**					
		Unit = Km.					
		Taking output = 50 km.					
		a) Labour					
		Mate	day	1.200	1.200	1.200	
		Mazdoor (skilled)	day	20.000	20.000	20.000	
		Mazdoor	day	10.000	10.000	10.000	
		b) Machinery					
		Road Retro reflectometer attached with SUV	hour	80.000	80.000	80.000	
		Road Retro reflectometer attached with SUV Mobilization & demobilization	hour	15.000	15.000	15.000	
		Add 1 percent of cost of a+b as Miscellaneous work					
		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 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	1.696	1.696	1.680	
		Mazdoor (skilled)	day	0.400	0.400	0.000	
		Mazdoor	day	42.000	42.000	42.000	
		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					

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 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 turfing 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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
11.01	307	**Spreading of Sludge Farm Yard Manure or/and good Earth** 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) **Unit = cum** **Taking output = 15 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 (a+b)**	**@ on (a+b)**	**@ on (a+b)**	
		Cost for 15 cum= a+b+c **Rate per cum = (a+b+c)/15**					
11.02	307	**Grassing with ' Doobs' Grass** 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 **Unit = sqm** **Taking output = 100 sqm**					
	(i)	**In rows 15 cm apart in either direction**					
		a) Labour					
		Mate	day	0.070	0.070	0.070	
		Mazdoor for grassing	day	0.750	0.750	0.750	
		Mazdoor for maintenance for 30 days	day	1.000	1.000	1.000	
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	0.500	0.500	
		c) Material					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Doob 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					
11.02	**(ii)**	**In rows 7.5 cm apart in either direction**					
		a) Labour					
		Mate	day	0.090	0.090	0.090	
		Mazdoor for grassing.	day	1.250	1.250	1.250	
		for maintenance for 30 days	day	1.000	1.000	1.000	
		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	0.060	0.060	0.060	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor for preparation of ground	day	0.500	0.500	0.500	
		Mali for fetching doobs grass roots and grassing at 15 cm apart	day	1.000	1.000	1.000	
		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	0.400	0.400	0.400	
		Mali	day	10.000	10.000	10.000	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of0.6 cum per 100 sqm **Unit = sqm** **Taking output = 100 sqm**					
		a) Labour					
		Mate	day	0.100	0.100	0.100	
		Mazdoor for preparation of ground	day	1.000	1.000	1.000	
		Mali for fetching doobs grass roots and grassing at 15 cm apart	day	1.500	1.500	1.500	
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	0.500	0.500	
		Tractor with tiller	hour	0.010	0.010	0.010	
		c) Material					
		Supply of farm yard manure at site of work @ 0.6 cum per 100 sqm	cum	0.600	0.600	0.600	
		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**					
11.06	307	**Maintenance of Lawns with Fine Grassing for the First Year** Maintenance of lawns with fine grassing for the first year including watering etc.					

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	0.400	0.400	0.400	
		Mali	day	10.000	10.000	10.000	
		b) Machinery					
		Water tanker 6 KL capacity	hour	20.000	20.000	20.000	
		c) Material					
		Cost of water	KL	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 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	0.560	0.560	0.560	
		Mazdoor for digging of trench 60 cm wide and 45 cm deep	day	10.000	10.000	10.000	
		Mazdoor for refilling the excavated earth mixed with cow dung, preparation of ground and digging of plant,	day	4.000	4.000	4.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		from the nursery carriage to site and planting in position					
		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	
		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	1.200	1.200	1.200	
		Mazdoor	day	30.000	30.000	30.000	
		b) Machinery					
		Water tanker 6 KL capacity	hour	5.000	5.000	5.000	
		c) Material					
		Manure sludge/Farm yard manure	cum	2.000	2.000	2.000	
		Pesticide	kg	0.500	0.500	0.500	
		Cost of water	KL	30.000	30.000	30.000	
		Cost of hedge plants @ 10 percent casualty	each	68.000	68.000	68.000	
		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					
11.08	**307**	**Planting and Maintaining of Flowering Plants and Shrubs**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(a) Planting flowering plants and shrubs in central verge **Unit= Running metres.** **Taking output = 1000 metres** 200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3m and above					
		a) Labour					
		Mate	day	0.480	0.480	0.480	
		Mazdoor	day	12.000	12.000	12.000	
		b) Machinery					
		Water tanker 6 KL capacity	hour	6.000	6.000	6.000	
		c) Material					
		Plants	each	200.000	200.000	200.000	
		Shrubs	each	800.000	800.000	800.000	
		Manure sludge/Farm yard manure	cum	63.640	63.640	63.640	
		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	14.600	14.600	14.600	
		Mazdoor	day	365.000	365.000	365.000	
		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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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, watering, fixing the tree guard and maintaining the plants for one year					
		Unit = Each					
		Taking output = 10 trees					
		a) Labour					
		Mate	day	0.680	0.680	0.680	
		Mazdoor for planting	day	2.000	2.000	2.000	
		Mazdoor for maintenance for one year	day	15.000	15.000	15.000	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 **Unit = sqm** **Taking output = 100 sqm**					
		a) Labour					
		Mate	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	0.500	0.500	
		c) Material					
		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 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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = one cum					
		a) Material					
		a) Cost of well decayed farm yard manure duly screened, loading, carriage, 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)					
11.12	**308.2**	**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, loading, unloading and stacking in store/site	quintal	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 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
11.14	308 & 1300	**Half Brick Circular Tree Guard, in 2nd Class Brick, internal dia metre 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 diametre 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	0.020	0.020	0.020	
		Mason	day	0.250	0.250	0.250	
		Mazdoor	day	0.250	0.250	0.250	
		b) Material					
		Brick 2nd class including carriage	each	230.000	230.000	230.000	
		Cement mortar 1:6 (Rate taken from sub-analysis 21.01 D)	cum	0.025	0.025	0.025	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		surplus earth within a lead of 50 metres **Unit = Metre** **Taking output= 10 metres**					
		a) Labour					
		Mate	day	0.004	0.004	0.004	
		Mason	day	0.050	0.050	0.050	
		Mazdoor	day	0.050	0.050	0.050	
		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 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	0.009	0.009	0.009	
		Blacksmith	day	0.150	0.150	0.150	
		Mazdoor	day	0.070	0.070	0.070	
		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)**	

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 for each tree guard = a+b+c+d					
11.17	Suggestive	**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		0.016	0.016	0.016	
		Blacksmith	day	0.200	0.200	0.200	
		Mazdoor		0.200	0.200	0.200	
		b) Material					
		Empty bitumen drum	each	1.500	1.500	1.500	
		MS sheet50 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	
		MSplate30 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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	0.180	0.180	0.180	
		Blacksmith/ welder for cutting to design and shape and jointing	day	2.000	2.000	2.000	
		Mazdoor for fixing and helper for Blacksmith/ welder	day	2.500	2.500	2.500	
		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 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.020	0.020	0.020	
		Blacksmith	day	0.250	0.250	0.250	
		Mazdoor	day	0.250	0.250	0.250	
		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	
		d) Painting					
		Painting two coats including priming Rate for concrete may be adopted vide item no. 8.09	sqm	1.770	1.770	1.770	
		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					

1. The items of excavation and concreting to be measured and paid separately as per design.
2. Rate of painting may be adopted from the chapter as Traffic signs.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 wire3 mm dia welded and fabricated as per design in two halves bolted together					
		Unit = Each					
		Taking output = one					
		a) Labour					
		Mate	day	0.030	0.030	0.030	
		Blacksmith	day	0.250	0.250	0.250	
		Welder	day	0.250	0.250	0.250	
		Mazdoor	day	0.250	0.250	0.250	
		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	
		d) Painting					
		Painting two coats including priming	sqm	1.500	1.500	1.500	
		Rate for concrete 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	1.000	1.000	1.000	
		Mazdoor	day	25.000	25.000	25.000	
		ii) For Maintenance for one year					
		Mate	day	5.000	5.000	5.000	
		Mazdoor	day	50.000	50.000	50.000	
		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 yard/sludge manure (planting)	cum	60.900	60.900	60.900	
		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	

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 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**					
		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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 miscelleneus (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: New/ Widening of Bridge / Structure Works	20 percent
Category 2: Rehabilitation of Bridges / Structure	30 percent

B. STRUCTURE WORKS

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

Contractor Profit : 10 percent of cost of works

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 (I^{st} 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.

B. STRUCTURE WORKS

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

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, 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 project and all situations. There may be specialized items for specific case, 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 work 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.

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	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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 (I) A	**(ii)**	**Depth 3 m to 6 m**					
		a) Labour					
		Mate/Supervisor	day	0.180	0.180	0.180	
		Mazdoor	day	4.500	4.500	4.500	
		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 (I) A	**(iii)**	**Depth above 6 m**					
		a) Labour					
		Mate/Supervisor	day	0.240	0.240	0.240	
		Mazdoor	day	6.000	6.000	6.000	

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	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	4.627			
		(ii) 1.1 cum bucket capacity	hour		5.329		
		(iii) 0.9 cum bucket capacity	hour			7.450	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	2.776			
		(ii) 1.1 cum bucket capacity	hour		3.197		
		(iii) 0.9 cum bucket capacity	hour			4.470	
		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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	4.674			
		(ii) 1.1 cum bucket capacity	hour		5.383		
		(iii) 0.9 cum bucket capacity	hour			7.525	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	2.804			
		(ii) 1.1 cum bucket capacity	hour		3.230		
		(iii) 0.9 cum bucket capacity	hour			4.515	
		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	0.320	0.320	0.320	
		Mazdoor	day	8.000	8.000	8.000	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	4.732			

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 1.1 cum bucket capacity	hour		5.450		
		(iii) 0.9 cum bucket capacity	hour			7.619	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	2.839			
		(ii) 1.1 cum bucket capacity	hour		3.270		
		(iii) 0.9 cum bucket capacity	hour			4.571	
		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	0.200	0.200	0.200	
		Mazdoor	day	5.000	5.000	5.000	
		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.

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	0.120	0.120	0.120	
			Mazdoor	day	3.000	3.000	3.000	
			b) Machinery					
			Hydraulic Excavator					
			Excavator for excavation					
			(i) 1.2 cum bucket capacity	hour	5.818			
			(ii) 1.1 cum bucket capacity	hour		6.845		
			(iii) 0.9 cum bucket capacity	hour			7.273	
			For loading					
			(i) 1.2 cum bucket capacity	hour	0.872			
			(ii) 1.1 cum bucket capacity	hour		1.005		
			(iii) 0.9 cum bucket capacity	hour			1.405	
			Jack Hammer	hour	5.818	6.845	7.273	
			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	0.872			
			(ii) 14 cum capacity	hour		1.005		
			(iii) 10 cum capacity	hour			1.405	
			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,					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
	A	**Manual Means**					
		Unit = cum					
		Taking output = 120 cum					
		a) Labour					
		Mate	day	0.210	0.210	0.210	
		Mazdoor	day	3.000	3.000	3.000	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		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	1.024	1.205	1.280	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	1.024			
		(ii) 1.1 cum bucket capacity	hour		1.205		
		(iii) 0.9 cum bucket capacity	hour			1.280	
		For loading					
		(i) 1.2 cum bucket capacity	hour	2.094			
		(ii) 1.1 cum bucket capacity	hour		2.411		
		(iii) 0.9 cum bucket capacity	hour			3.371	
		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	2.094			
		(ii) 14 cum capacity	hour		2.411		
		(iii) 10 cum capacity	hour			3.371	

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 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					
	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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Jack Hammer	hour	5.973	6.788	7.467	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	5.973			
		(ii) 1.1 cum bucket capacity	hour		6.788		
		(iii) 0.9 cum bucket capacity	hour			7.467	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.611			
		(ii) 1.1 cum bucket capacity	hour		0.703		

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 0.9 cum bucket capacity	hour			0.983	
		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	0.611			
		(ii) 14 cum capacity	hour		0.703		
		(iii) 10 cum capacity	hour			0.983	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 3metre 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	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	8.506			
		(ii) 1.1 cum bucket capacity	hour		9.796		
		(iii) 0.9 cum bucket capacity	hour			13.695	
		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	8.506			
		(ii) 14 cum capacity	hour		9.796		
		(iii) 10 cum capacity	hour			13.695	
		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	0.120	0.120	0.120	
		Mazdoor for dressing sides, bottom and backfilling	day	3.000	3.000	3.000	
		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					

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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.125 x L1 + 0.75			
		(ii) 12 KL capacity	hour		0.167 x L1 + 1		
		(iii) 6 KL capacity	hour			0.333 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	0.320	0.320	0.320	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	7.000	7.000	7.000	

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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.023 x L1 + 0.135			
		(ii) 12 KL capacity	hour		0.03 x L1 + 0.18		
		(iii) 6 KL capacity	hour			0.06 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 Ist 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	0.480	0.480	0.480	
		Mason	day	4.000	4.000	4.000	
		Mazdoor	day	8.000	8.000	8.000	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					

Sr. No.	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			(i) 16 KL capacity	hour	0.017 x L1 + 0.101			
			(ii) 12 KL capacity	hour		0.022 x 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+e					
			Rate per cum (a+b+c+d+e)/5					
12.06	**Subana lysis**	**(A)**	**Cement Mortar 1:3 (1 cement : 3 sand)**					
			Unit = 1 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 = 1 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 = 1 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 = 1 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)**					
			a) Material					

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.x0.24mx0.24mx0.39m = 0.79 cu.m)	each	35.000	35.000	35.000	
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	1.500	1.500	1.500	
		b) Labour					
		Mate	day	0.660	0.660	0.660	
		Mason	day	7.500	7.500	7.500	
		Mazdoor	day	9.000	9.000	9.000	
		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 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	0.600	0.600	0.600	
		Mason	day	6.000	6.000	6.000	
		Mazdoor	day	9.000	9.000	9.000	
		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 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.**					
	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-	cum	30.000	30.000	30.000	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		analysis 21.03)					
		Water for curing	Kl	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					
		Mate	day	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	

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	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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**	**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 (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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 x L1 + 0.875	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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**	**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 21.06)	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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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**	**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	

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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		c) Machinery					
		Transit truck agitator					

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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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**	**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 (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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					

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 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 (Rate taken from sub-analysis 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 x L1 + 0.875	
		d) **Formwork** @ 4 percent on cost of concrete i.e. cost of material, labour and machinery					

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	**F**	**PCC Grade M30**					
	Case I	**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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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**	**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 21.09)	cum	30.000	30.000	30.000	

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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					

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 @ 20km/hr and return speed @ 30 km/hr and unloading @30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					

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 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 x L1 + 0.875	
		d) Formwork @ 4 percent on cost of concrete i.e. cost of material, labour and machinery					

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**	**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 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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**	**RCC Grade M45**					
	Case I	**RCC Grade M45 using batching plant, transit mixer & Concrete pump**					
		Unit = cum					
		Taking output = 30 cum					

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 21.13)	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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					
		WELL FOUNDATION					
12.09	**1200**	**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 = 1 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	hour	30.000	30.000	30.000	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		capacity					
		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 = 1 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 and 9 m long	each	143.000	143.000	143.000	
		Wooden ballies 2" Dia for bracing	metre	285.000	285.000	285.000	
		b) Labour					
		Mate	day	8.400	8.400	8.400	
		Mazdoor for piling 8" dia ballies for piling 8" dia ballies	day	27.000	27.000	27.000	
		Mazdoor for bracing with 2" dia ballies	day	18.000	18.000	18.000	
		Mazdoor for filling sand bags, stitching and placing	day	165.000	165.000	165.000	
		c) Machinery					
		Crane with grab 1 cum capacity	hour	75.000	75.000	75.000	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		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 MoRT&H specifications.					
12.09	**C**	**Providing and constructing one span service road to reach island location from one pier location to another pier location**					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Assuming span length 30 m, width of service road 10 m and depth of water 1 m					
		Unit = 1 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 = 1 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	1.080	1.080	1.080	
		Fitter	day	4.500	4.500	4.500	
		Blacksmith	day	4.500	4.500	4.500	

Sr. No.	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Welder	day	4.500	4.500	4.500	
			Mazdoor	day	13.500	13.500	13.500	
			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)					
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 (i)		**Case I**	**RCC Grade M20 using batching plant & Concrete pump**					
			Unit = cum					
			Taking output = 30 cum					
			a) Material					
			Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	30.000	30.000	30.000	
			b) Labour					
			For pouring and placing					
			Mate	day	0.133	0.133	0.133	
			Mason	day	1.000	1.000	1.000	
			Mazdoor	day	2.325	2.325	2.325	
			c) Machinery					
			Transit truck agitator					
			For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
			For unloading	hour	0.650	0.650	0.650	
			Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
			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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				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 (Rate taken from sub-analysis 21.06)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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					
	(ii)	**RCC M25 Grade**					
12.11 A (ii)	Case I	**RCC Grade M25 using batching plant & Concrete pump**					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer	hour	0.650	0.650	0.650	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		pump					
		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 (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)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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	**(iii)**	**RCC M30 Grade**					
12.11 A (iii)	**Case I**	**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)	cum	30.000	30.000	30.000	

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	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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.

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 (iv)	**Case I**	**RCC Grade M35 using batching plant & Concrete pump**					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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 (iv)	**Case II**	**RCC Grade M35 using batching plant & manual placing**					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	

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 (v)	**Case I**	**RCC Grade M40 using batching plant & 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	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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 (v)	**Case II**	**RCC Grade M40 using batching plant & manual placing** **Unit = cum** **Taking output = 15 cum**					

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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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 (i)	**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 21.03)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	

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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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	**(ii)**	**PCC M20 Grade**					
12.11 B (ii)	**Case I**	**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	

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	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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					

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 (iii)	**Case I**	**RCC Grade M20 using batching plant & Concrete pump**					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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 (iii)	**Case II**	**RCC Grade M20 using batching plant & manual placing**					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.06)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	

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 (iv)	**Case I**	**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	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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 (iv)	**Case II**	**PCC Grade M25 using batching plant & manual placing**					
		Unit = cum					
		Taking output = 15 cum					

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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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 (v)	**Case I**	**RCC Grade M25 using batching plant & Concrete pump**					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		d) Formwork @ 10 percent on cost of concrete i.e. cost of material, labour and machinery					

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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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)**	**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	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	

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)V	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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					

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 (vii)	**Case I**	**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)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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 (vii)	**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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	

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 (viii)	**Case I**	**RCC Grade M35 using batching plant & Concrete pump**					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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 (viii)	**Case II**	**RCC Grade M35 using batching plant & manual placing**					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	15.000	15.000	15.000	

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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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 (ix)	**Case I**	**RCC Grade M40 using batching plant & 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	
		b) Labour					
		For pouring and placing					
		Mate	day	0.133	0.133	0.133	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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					

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 (Rate taken from sub-analysis 21.12)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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	**C**	**Bottom Plug**					
	(i)	**PCC Grade M20**					
	Case I	**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	
		b) Labour					
		For pouring and placing					
		Mate	day	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Hydra Crane for holding tremie pipe	hour	0.650	0.650	0.650	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 C	(ii)	**PCC Grade M25**					
	Case I	**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	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Hydra Crane for holding tremie pipe	hour	0.650	0.650	0.650	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	

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)**	**PCC Grade M30**					
	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	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Hydra Crane for holding tremie pipe	hour	0.650	0.650	0.650	
		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.					

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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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)**	**PCC Grade M35**					
	Case I	**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	

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	0.093	0.093	0.093	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Hydra Crane for holding tremie pipe	hour	0.650	0.650	0.650	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	
		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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	**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 (i)	**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. 12.11 (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 (i)	**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. 12.11 (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 (ii)	**Case I**	**PCC Grade M25 using batching plant & Concrete pump**					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					

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)					

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 12.08(A) excluding formwork					
12.11 E (i)	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)					
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 (i)	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)					
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 (ii)	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)					
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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)	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)					

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 12.08 (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 12.08(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)					

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)**	**@ on (a+b+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	**F**	**Well cap**					
	(i)	**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 21.06)	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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	
		d) Formwork @ 4 percent on cost of concrete i.e. cost of material, labour and machinery					

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 (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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					

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 (ii)	**Case I**	**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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 M25 using batching plant, transit mixer & manual placing**					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-	cum	15.000	15.000	15.000	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		analysis 21.07)					
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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 (iii)	**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 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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 (iv)	**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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 (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 (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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					

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 (v)	**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 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 (v)	**Case II**	**RCC Grade M40 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	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(Rate taken from sub-analysis 21.12)					
		Water for curing	Kl	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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)**	**RCC Grade M45**					
	Case I	**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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.120	0.120	0.120	
		Sinker (skilled)	day	1.000	1.000	1.000	
		Sinking helper (semi-skilled)	day	2.000	2.000	2.000	
		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)					

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	0.150	0.150	0.150	
		Sinker	day	1.250	1.250	1.250	
		Sinking helper (semi-skilled)	day	2.500	2.500	2.500	
		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 (6 m 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	0.150	0.150	0.150	
		Sinker (skilled)	day	1.500	1.500	1.500	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		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	0.300	0.300	0.300	
		Sinker	day	3.000	3.000	3.000	
		Sinking helper (semi-skilled)	day	4.500	4.500	4.500	
		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					

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	0.490	0.490	0.490	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	8.000	8.000	8.000	
		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					

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	0.500	0.500	0.500	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	6.000	6.000	6.000	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		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	0.410	0.410	0.410	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	6.000	6.000	6.000	
		b) Machinery					
		Air Compressor 250 cfm	hour	47.124	47.124	47.124	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic breaker	hour	94.248	94.248	94.248	
		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)					
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	0.150	0.150	0.150	
		Sinker (skilled)	day	1.250	1.250	1.250	
		Sinking helper (semi-skilled)	day	2.500	2.500	2.500	
		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)					

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	0.180	0.180	0.180	
		Sinker	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	3.000	3.000	3.000	
		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	4.500	4.500	4.500	
		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)					
12.13 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	0.180	0.180	0.180	
		Sinker (skilled)	day	1.500	1.500	1.500	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	3.000	3.000	3.000	
		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	0.240	0.240	0.240	
		Sinker	day	2.000	2.000	2.000	
		Sinking helper (semi-skilled)	day	4.000	4.000	4.000	
		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					

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	0.570	0.570	0.570	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	10.000	10.000	10.000	
		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					

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	0.580	0.580	0.580	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	8.000	8.000	8.000	
		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	0.490	0.490	0.490	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	8.000	8.000	8.000	

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	0.180	0.180	0.180	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	3.000	3.000	3.000	
		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)					

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	0.210	0.210	0.210	
		Sinker	day	1.750	1.750	1.750	
		Sinking helper (semi-skilled)	day	3.500	3.500	3.500	
		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	5.000	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)**	
		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	0.220	0.220	0.220	
		Sinker (skilled)	day	2.000	2.000	2.000	
		Sinking helper (semi-skilled)	hour	3.500	3.500	3.500	

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	0.280	0.280	0.280	
		Sinker	day	2.500	2.500	2.500	
		Sinking helper (semi-skilled)	day	4.500	4.500	4.500	
		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).					

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	0.650	0.650	0.650	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	12.000	12.000	12.000	
		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	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		Mate	day	0.660	0.660	0.660	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	10.000	10.000	10.000	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		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	0.570	0.570	0.570	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	10.000	10.000	10.000	
		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)					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	**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	0.190	0.190	0.190	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	3.250	3.250	3.250	
		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	0.230	0.230	0.230	
		Sinker	day	1.750	1.750	1.750	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	4.000	4.000	4.000	
		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	0.240	0.240	0.240	
		Sinker (skilled)	day	2.250	2.250	2.250	
		Sinking helper (semi-skilled)	day	3.750	3.750	3.750	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. Consumables in sinking	hour	5.750	5.750	5.750	

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	0.300	0.300	0.300	
		Sinker	day	2.500	2.500	2.500	
		Sinking helper (semi-skilled)	day	5.000	5.000	5.000	
		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					
	b	Add 5 percent of cost for dewatering, if required					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	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	0.730	0.730	0.730	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	14.000	14.000	14.000	
		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	0.740	0.740	0.740	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	12.000	12.000	12.000	
		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	0.650	0.650	0.650	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	12.000	12.000	12.000	
		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	

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	0.200	0.200	0.200	
			Sinker (skilled)	day	1.500	1.500	1.500	
			Sinking helper (semi-skilled)	day	3.500	3.500	3.500	
			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	5.000	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)**	
			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	0.250	0.250	0.250	
			Sinker	day	2.000	2.000	2.000	
			Sinking helper (semi-skilled)	day	4.250	4.250	4.250	
			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	5.750	5.750	5.750	

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)**					
		Unit = Running Meter					
		Taking output = 1 cum					
	(i)	**Depth below bed level upto 3.0 M**					
		Rate of sinking 0.18m/hour.					
		a) Labour					
		Mate	day	0.320	0.320	0.320	
		Sinker (skilled)	day	2.500	2.500	2.500	
		Sinking helper (semi-skilled)	day	5.500	5.500	5.500	
		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	6.000	6.000	6.000	
		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)					
12.16 B	**(ii)**	**Beyond 3m upto 10m depth**					
		Rate of sinking 0.15m/hour.					

Sr. No.	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			a) Labour					
			Mate	day	0.340	0.340	0.340	
			Sinker	day	3.000	3.000	3.000	
			Sinking helper (semi-skilled)	day	5.500	5.500	5.500	
			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	**Extra over item no. 12.16 (A) or (B) irrespective of depth for sinking in Soft Rock (10 m dia well)**					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.810	0.810	0.810	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	16.000	16.000	16.000	
		b) Machinery					
		Air Compressor 250 cfm	hour	78.540	78.540	78.540	
		Pneumatic breaker	hour	157.080	157.080	157.080	
		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)					
12.16	D	**Extra over item no. 12.16 (A) or (B) irrespective of depth for sinking in Hard Rock (10 m dia well)**					
		Unit = Running Meter					
		Taking output = 1 m					
		a) Material					
		Small dia Explosive at 0.20 kg / cum	kg	15.708	15.708	15.708	
		Electric detonators	no	82.000	82.000	82.000	
		Detonating fuse coil	m	255.000	255.000	255.000	
		b) Labour					
		Mate	day	0.820	0.820	0.820	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	14.000	14.000	14.000	

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	0.730	0.730	0.730	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	14.000	14.000	14.000	
		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)					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.17	1200	**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.**					
		Unit = Running Meter					
		Taking output = 0.50 m					
		Diameter of well - 11 m.					
		A Sandy Soil					
		(i) Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.15 m/hour					
		a) Labour					
		Mate	day	0.192	0.192	0.192	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	3.300	3.300	3.300	
		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	6.000	6.000	6.000	
		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 0.5m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.50					
12.17 A		**(ii) Beyond 3m upto 10m depth**					
		Rate of sinking @ 0.13 m/hour					
		a) Labour					
		Mate	day	0.260	0.260	0.260	
		Sinker	day	2.000	2.000	2.000	
		Sinking helper (semi-skilled)	day	4.500	4.500	4.500	
		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	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 0.5m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.50					

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	0.260	0.260	0.260	
		Sinker (skilled)	day	2.500	2.500	2.500	
		Sinking helper (semi-skilled)	day	4.000	4.000	4.000	
		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	0.370	0.370	0.370	
		Sinker	day	3.500	3.500	3.500	
		Sinking helper (semi-skilled)	day	5.750	5.750	5.750	

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.	hour	6.000	6.000	6.000	
			Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.250	4.250	4.250	
			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 0.5m = 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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.890	0.890	0.890	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	18.000	18.000	18.000	
		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	0.900	0.900	0.900	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	16.000	16.000	16.000	
		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	

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	0.810	0.810	0.810	
			Sinker (skilled)	day	1.500	1.500	1.500	
			Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
			Diver	day	0.500	0.500	0.500	
			Mazdoor	day	16.000	16.000	16.000	
			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**					

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)	**Depth below bed level upto 3.0 M**					
		Rate of sinking @ 0.05 m/hour					
		a) Labour					
		Mate	day	0.230	0.230	0.230	
		Sinker (skilled)	day	1.750	1.750	1.750	
		Sinking helper (semi-skilled)	day	4.000	4.000	4.000	
		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	0.290	0.290	0.290	
		Sinker	day	2.500	2.500	2.500	
		Sinking helper (semi-skilled)	day	4.750	4.750	4.750	
		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					

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	0.300	0.300	0.300	
		Sinker (skilled)	day	3.000	3.000	3.000	
		Sinking helper (semi-skilled)	day	4.500	4.500	4.500	
		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	0.390	0.390	0.390	
		Sinker	day	3.750	3.750	3.750	

Sr. No.	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Sinking helper (semi-skilled)	day	6.000	6.000	6.000	
			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.**					

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	0.970	0.970	0.970	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	20.000	20.000	20.000	
		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	0.980	0.980	0.980	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	18.000	18.000	18.000	
		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	

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	0.890	0.890	0.890	
			Sinker (skilled)	day	1.500	1.500	1.500	
			Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
			Diver	day	0.500	0.500	0.500	
			Mazdoor	day	18.000	18.000	18.000	
			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**					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
		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	0.200	0.200	0.200	
		Sinker (skilled)	day	1.250	1.250	1.250	
		Sinking helper (semi-skilled)	day	3.750	3.750	3.750	
		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)					
12.19 A	**(ii)**	**Beyond 3m upto 10m depth**					
		Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate	day	0.220	0.220	0.220	
		Sinker	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	4.000	4.000	4.000	
		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	5.880	5.880	5.880	
		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)					

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	0.260	0.260	0.260	
		Sinker (skilled)	day	2.500	2.500	2.500	
		Sinking helper (semi-skilled)	day	4.000	4.000	4.000	
		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	0.370	0.370	0.370	
		Sinker	day	3.250	3.250	3.250	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	6.000	6.000	6.000	
		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).					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.19	C	**Extra over item no. 12.19 (A) or (B) irrespective of depth for sinking in Soft Rock**					
		Unit = Running Meter.					
		Taking output = 1 m					
		a) Labour					
		Mate	day	0.730	0.730	0.730	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	14.000	14.000	14.000	
		b) Machinery					
		Air Compressor 250 cfm	hour	64.274	64.274	64.274	
		Pneumatic breaker	hour	128.549	128.549	128.549	
		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)					
12.19	D	**Extra over item no. 12.19 (A) or (B) irrespective of depth for sinking in Hard Rock**					
		Unit = Running Meter					
		Taking output = 1 m					
		a) Material					
		Small dia Explosive at 0.20 kg / cum	kg	12.855	12.855	12.855	
		Electric detonators	no	72.000	72.000	72.000	
		Detonating fuse coil	m	224.000	224.000	224.000	
		b) Labour					
		Mate	day	0.740	0.740	0.740	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Driller	day	2.000	2.000	2.000	
		Blaster	day	0.250	0.250	0.250	
		Mazdoor	day	12.000	12.000	12.000	
		c) Machinery					
		Air Compressor 250 cfm	hour	50.260	50.260	50.260	
		Pneumatic breaker	hour	51.419	51.419	51.419	

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	0.650	0.650	0.650	
		Sinker (skilled)	day	1.500	1.500	1.500	
		Sinking helper (semi-skilled)	day	2.250	2.250	2.250	
		Diver	day	0.500	0.500	0.500	
		Mazdoor	day	12.000	12.000	12.000	
		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)					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.20	1200	**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 plateforms 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 clause1208.8 of MoRT&H Specifications.**					
		Unit = cum					
		Taking output = 5 cum					
		a) Material					
		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	
		Blasting material					
		Explosives	Kg	1.500	1.500	1.500	
		Electric detonators	each	6.000	6.000	6.000	
		b) Labour					
		Mate	day	1.880	1.880	1.880	
		Driller	day	1.000	1.000	1.000	
		Blaster	day	0.500	0.500	0.500	
		Mazdoor (for cutting, blasting, cleaning,	day	30.000	30.000	30.000	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		removal of Material etc.)					
		Mazdoor (Skilled) (for fixation and removal of adopter for air lock, carrying out mechanical and electrical operations and repairs and other skilled jobs.)	day	10.000	10.000	10.000	
		Diver	day	4.000	4.000	4.000	
		Medical Officer	day	0.500	0.500	0.500	
		Para medical personnel	day	1.000	1.000	1.000	
	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.

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		4. In case pneumatic sinking is involved on a dry bed, the provision of barge and boat may be omitted. 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	0.012	0.012	0.012	
		Mazdoor	day	0.300	0.300	0.300	
		c) Overhead charges @ on (a+b)					
		d) Contractor's profit @ 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 = 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	0.800	0.800	0.800	
		Fitter	day	4.000	4.000	4.000	
		Blacksmith	day	4.000	4.000	4.000	
		Welder	day	4.000	4.000	4.000	
		Mazdoor	day	8.000	8.000	8.000	
		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+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	**@ on (a+b+c) @ on (a+b+c+d)**	
		e) Contractor's profit					
		Rate for per MT (a+b+c+d+e)					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.23	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.**					
		Pile diameter-750 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) Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)	cum	11.490	11.486	11.486	
		Concrete to be cast with a tremie pipe 200mm dia.					
		Bentonite	kg	574.500	574.322	574.322	
		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	6.000	6.000	6.000	
		Hire and running charges of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc.	hour	3.138	3.138	3.138	
		Hire and running charges of Bentonite pump	hour	6.000	6.000	6.000	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	29.07 x L1	29.07 x L1	29.07 x L1	
		For unloading	hour	0.638	0.638	0.638	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	0.342			
		(ii) 2.1 Cum Capacity	hour		0.504		
		(iii) 1 Cum Capacity	hour			1.064	

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	0.342			
		(ii) 14 cum capacity	hour		0.504		
		(iii) 10 cum capacity	hour			1.064	
		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	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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					
12.24	**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)	cum	20.420	20.420	20.420	
		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.					
		Bentonite	kg	1021.018	1021.018	1021.018	
		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	hour	6.000	6.000	6.000	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		another.					
		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	0.608			
		(ii) 2.1 Cum Capacity	hour		0.896		
		(iii) 1 Cum Capacity	hour			1.891	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	0.608			
		(ii) 14 cum capacity	hour		0.896		
		(iii) 10 cum capacity	hour			1.891	
		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	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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) 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	0.875			
		(ii) 2.1 Cum Capacity	hour		1.290		
		(iii) 1 Cum Capacity	hour			2.723	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	0.875			
		(ii) 14 cum capacity	hour		1.290		
		(iii) 10 cum capacity	hour			2.723	
		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	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Labour					
		Mate/Supervisor	day	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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 (including additional concreting of 1 m for pile head)	cum	45.946	45.946	45.946	
		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	1.367			

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 2.1 Cum Capacity	hour		2.015		
		(iii) 1 Cum Capacity	hour			4.254	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	1.367			
		(ii) 14 cum capacity	hour		2.015		
		(iii) 10 cum capacity	hour			4.254	
		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	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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					
12.27	**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	

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	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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 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	

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	0.160	0.160	0.160	
		Mazdoor	day	4.000	4.000	4.000	
		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 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 Rate for concrete may be adopted vide item no. 12.11 F (iv)	cum	22.610	22.610	22.610	
		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	

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	0.180	0.180	0.180	
		Mazdoor	day	4.500	4.500	4.500	
		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 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/20					

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.

12.30	**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)					

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					
		Crane20 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	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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	

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	0.160	0.160	0.160	
		Mazdoor	day	4.000	4.000	4.000	
		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	

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	0.200	0.200	0.200	
		Mazdoor	day	5.000	5.000	5.000	
		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& 1700**	**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	
		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 10 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	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Labour					
		Mate/Supervisor	day	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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 M35Rate for concrete may be adopted vide item no. 12.11 F (iv)	cum	12.500	12.500	12.500	
		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	0.160	0.160	0.160	
		Mazdoor	day	4.000	4.000	4.000	
		Add 1 percent of (a+b+c) for carriage of piles from casting yard to work site					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	
		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	0.180	0.180	0.180	
		Mazdoor	day	4.500	4.500	4.500	
		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)**	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	
		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	0.120	0.120	0.120	
		Mazdoor	day	3.000	3.000	3.000	
		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					

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	0.140	0.140	0.140	
		Mazdoor	day	3.500	3.500	3.500	
		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	0.040	0.040	0.040	
		Mazdoor with Pneumatic breaker	day	0.500	0.500	0.500	
		Blacksmith	day	0.250	0.250	0.250	
		Mazdoor for loading and unloading	day	0.250	0.250	0.250	

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	0.146	0.146	0.146	
			Mason	day	1.000	1.000	1.000	
			Mazdoor	day	2.650	2.650	2.650	
			c) Machinery					
			Transit truck agitator					
			For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
			For unloading	hour	1.300	1.300	1.300	
			Hydraulic Boom placer pump	hour	1.300	1.300	1.300	
			d) Formwork @ 4 percent on cost of concrete i.e. cost of material, labour and machinery					

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 (Rate taken from sub-analysis 21.06)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	**B**	**RCC Grade M25**					
	Case I	**RCC Grade M25 using batching plant & Concrete pump**					
		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	0.146	0.146	0.146	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.650	2.650	2.650	
		c) Machinery					

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	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.300	1.300	1.300	
		Hydraulic Boom placer pump	hour	1.300	1.300	1.300	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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**	**RCC Grade M30**					
	Case I	**RCC Grade M30 using batching plant & Concrete pump**					
		Unit = cum					
		Taking output = 60 cum					

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	0.146	0.146	0.146	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.650	2.650	2.650	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.300	1.300	1.300	
		Hydraulic Boom placer pump	hour	1.300	1.300	1.300	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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)**	

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	0.146	0.146	0.146	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.650	2.650	2.650	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.300	1.300	1.300	
		Hydraulic Boom placer pump	hour	1.300	1.300	1.300	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	8.000	8.000	8.000	
		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)/6					
12.40	**E**	**RCC Grade M40**					
	Case I	**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	0.146	0.146	0.146	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.650	2.650	2.650	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.300	1.300	1.300	
		Hydraulic Boom placer pump	hour	1.300	1.300	1.300	
		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 M40 using batching plant & manual**					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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	0.146	0.146	0.146	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	2.650	2.650	2.650	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.300	1.300	1.300	
		Hydraulic Boom placer pump	hour	1.300	1.300	1.300	
		d) Formwork @ 4 percent					

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.360	0.360	0.360	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	8.000	8.000	8.000	
		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& 1700**	**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**					
		Unit = cum					
		Taking output = 30 cum					

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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	
		b) Labour					
		For pouring and placing					
		Mate	day	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		c) Machinery					
		Transit truck agitator					

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 @ 20km/hr and return speed @ 30 km/hr and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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		

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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		

Sr. No.	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(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 – 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	0.064	0.064	0.064	
		Mason	day	0.800	0.800	0.800	
		Mazdoor	day	0.800	0.800	0.800	
		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	0.003 x L1 + 0.02			
		(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)					
13.02	1300 & 2200	**Pointing with cement mortar (1:3) on brick work in substructure as per Technical Specifications**					
		Unit = 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	0.040	0.040	0.040	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	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 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)	cum	0.144	0.144	0.144	
		Water for curing	KL	0.139	0.139	0.139	
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	0.500	0.500	0.500	
		c) Machinery					
		Water tanker (speed @ km/hr and return speed @ 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 + 0.015	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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	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	cum	1.000	1.000	1.000	
		Through and bond stone (7no.x0.24mx0.24mx0.39m = 0.16 cu.m)	No	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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Labour					
		Mate	day	0.096	0.096	0.096	
		Mason	day	1.200	1.200	1.200	
		Mazdoor	day	1.200	1.200	1.200	
		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	0.007 x L1 + 0.04			
		(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)					
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	0.120	0.120	0.120	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.500	1.500	1.500	
		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 + 0.04			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.054		

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)					
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.x0.24mx0.24mx0.39m = 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	0.200	0.200	0.200	
		Mason	day	2.500	2.500	2.500	
		Mazdoor	day	2.500	2.500	2.500	
		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	0.007 x L1 + 0.04			
		(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)					
	Note	The labour 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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.05		**A PCC Grade M15**					
		(p) Height upto 5m					
		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 -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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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		**(q) Height 5m to 10m**					
		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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) **Machinery**					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 C		**(r) Height above 10m**					
		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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 +		

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
					0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	
		d) Formwork @ 10 percent on					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 D		**(q) Height 5m to 10m**					
		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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

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**					
13.05 D		**(r) Height above 10m**					
		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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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)**	

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 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 E		**(q) Height 5m to 10m**					
		RCC Grade M20 using batching					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 E		**(r) Height above 10m**					
		RCC Grade M20 using batching plant, transit mixer & Concrete pump					
		Unit = cum					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					
		RCC Grade M25 using batching plant, transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
		a) Material					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 F		**(q) Height 5m to 10m**					
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For pouring and placing					
		Mate	day	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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)**	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
13.05 F		**(r) Height above 10m**					
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	
		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	0.153	0.153	0.153	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 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 G		**(r) Height above 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					

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	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					

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	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	

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	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

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 H		**(r) Height above 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	0.153	0.153	0.153	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 (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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 J		**(q) Height 5m to 10m**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 J		**(r) Height above 10m**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	

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	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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 K		**(q) Height 5m to 10m**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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**					
		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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.75	
		d) Formwork					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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: 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.					
13.06	**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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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			

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(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 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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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	

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					
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 foce. 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	
		Per Cum Basic Cost (Rate taken from sub-analysis - 21.01 A)	cum	0.050	0.050	0.050	
		b) Labour					
		Mate	day	0.030	0.030	0.030	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	0.250	0.250	0.250	
		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 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 10 cum					
		A Granular material					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor	day	7.000	7.000	7.000	
		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	0.280	0.280	0.280	
		Mazdoor for filling, watering, ramming etc.	day	7.000	7.000	7.000	
		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	
		d) Overhead charges		**@ on (a+b+c)**	**@ on (a+b+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 MoRT&H 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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 10 cum.					
		a) Labour					
		Mate	day	0.320	0.320	0.320	
		Mazdoor for filling, watering, ramming etc.	day	7.000	7.000	7.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRT&H 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.. 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 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. **Unit = Sqm**						

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking output = 300 Sqm					
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		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					
13.12	**704**	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 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, 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate	day	0.200	0.200	0.200	
		Mazdoor	day	3.000	3.000	3.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		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 transpotarion & 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					
13.13	**2000, 1000 & 2200**	**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 MoRT&H specifications complete including all accessories as per drawing and Technical Specifications.**					
		Unit = one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		b) Material					
		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	
		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)**	

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 250 tonnes capacity bearing = a+b+c+d					
		Rate per tonne capacity = (a+b+c+d)/250					
13.14	**2000 , 1000 & 2200**	**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 MoRT&H specifications complete including all accessories as per drawing and Technical Specifications.**					
		Unit = one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		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					
		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 MoRT&H Specifications.**					
		Unit = one tonne capacity					
		Considering a 80 tonne capacity bearing for this analysis					
		a) Labour					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
		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					
13.16	**2000 & 2200**	**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 MoRT&H specifications complete including all accessories as per drawing and Technical Specifications.**					
		Unit = one cubic centimetre					
		Considering an elastomeric bearing of size 500 x 400 x 96 mm for this analysis.					
		Overall volume - 19200 cu.cm					
		Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm.					
		Hence volume of elastomeric = 14655 cu.cm.					
		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					
		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	
		Add 1 percent of cost of					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		bearing assembly for foundation anchorage bolts and consumables.					
		c) Overhead charges		**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	
		d) Contractor's profit					
		cost for 19200cc of elastomeric bearing = a+b+c+d					
		Rate per cc of elastomeric bearing = (a+b+c+d)/19200					
13.17	**2000 & 2200**	**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.**					
		Unit = one tonne capacity					
		Considering the sliding bearing of 80 tonnes design capacity for this analysis.					
		a) Labour					
		Mate	day	0.044	0.044	0.044	
		Mazdoor	day	0.750	0.750	0.750	
		Mazdoor (Skilled)	day	0.350	0.350	0.350	
		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+c)**	**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	
		d) Contractor's profit					
		cost for 80 tonnes of capacity bearing = a+b+c+d					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 MoRT&H 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	0.080	0.080	0.080	
		Mazdoor	day	1.500	1.500	1.500	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		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+ **Rate per tonne capacity = (a+b+c+d)/250**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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	Kg.	52.500	52.500	52.500	
		Add 1 percent of cost of abs towards miscellaneous (water, painting brush 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**					
13.20		**Providing structural steel for sub-structure complete as per drawing and technical specifications** **Unit = MT** **Taking output = 10 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	12.312	12.312	12.312	
		Fitter	day	45.000	45.000	45.000	
		Blacksmith	day	45.000	45.000	45.000	
		Welder	day	45.000	45.000	45.000	
		Painter I class	day	18.900	18.900	18.900	
		Mazdoor	day	153.900	153.900	153.900	
		Electrodes, cutting gas and other consumables @ 10 percent of cost of **(a) above**					

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

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**					
		A	**RCC Grade M20**					
14.01 A			**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	0.192	0.192	0.192	
			Mason	day	1.500	1.500	1.500	
			Mazdoor	day	3.300	3.300	3.300	
			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	2.600	2.600	2.600	
			Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
			(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
			(ii) 12 KL capacity	hour		0.583 x L1 + 3.500		
			(iii) 6 KL capacity	hour			1.167 x L1 + 7.000	
			For formwork and staging add the following:					
14.01 A		**(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					

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**					
14.01 A	**(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**					
14.01 A	**(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**					
14.01 A	**(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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01 A	(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					
14.01 A (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	B Case II	**RCC Grade M25 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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For unloading	hour	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7	
		For formwork and staging add the following:					
14.01 B	**(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					
14.01 B (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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01 B (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)	@ 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 B	(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					
14.01 B (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					
14.01 B (ii)	(r)	**Height above 10m**					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	
		For unloading	hour	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7	
		For formwork and staging add the following:					

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					

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 Case II**	**RCC/PSC Grade M35 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		placing					
		Mate	day	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7	
		For formwork and staging add the following:					
14.01 D	**(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					
14.01 D (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)					

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					
14.01 D (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					
14.01 D	**(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					
14.01 D (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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01 D (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					
14.01 D	(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					
14.01 D (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					
14.01 D (iii)	(r)	**Height above 10m**					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7	
		For formwork and staging add the following:					

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 15 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					

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)					

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					
14.01E (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					
14.01E (iii)	**(r)**	**Height above 10m**					
		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 (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	**F**	**RCC/PSC Grade M-45**					
		Unit = 1 cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.13)	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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	

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) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	300 x L1	
		For unloading	hour	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		
		(iii) 6 KL capacity	hour			1.167 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 (i)	**(q)**	**Height 5m to 10m**					
		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					

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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01F (ii)	(r)	**Height above 10m**					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 31 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	(iii)	**For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56 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 36 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 (iii)	(q)	**Height 5m to 10m**					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 46 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01F (iii)	(r)	**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		**@ 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	G	**PSC Grade M-50**					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7	
		For formwork and staging add the following:					

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

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 = 1 cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.15)	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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.500		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7.000	
		For formwork and staging add the following:					
14.01 H	(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)**	

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					
14.01 H (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					
14.01 H (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					
	Note	1. Cement provided for various components of the super structure is for estimating purpose					
		2. 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.					
		3. 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 = 1 cum					
		Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.16)	cum	120.000	120.000	120.000	
		Water for curing	Kl	63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.500		
		(iii) 6 KL capacity	hour			1.167 x L1 + 7.000	
		For formwork and staging add the following:					
14.01 H	**(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					
14.01 H (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**	**@ on**	**@ on**	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		f) Contractor's profit		**(a+b+c+d) @ on (a+b+c+d+e)**	**(a+b+c+d) @ on (a+b+c+d+e)**	**(a+b+c+d) @ 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 H (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 (Rate taken from sub-analysis -21.17)	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	0.192	0.192	0.192	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	3.300	3.300	3.300	
		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	2.600	2.600	2.600	
		Hydraulic Boom placer pump	hour	2.600	2.600	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.438 x L1 + 2.625			
		(ii) 12 KL capacity	hour		0.583 x L1 + 3.5		

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour			1.167 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					
14.01 H (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					
14.01 H (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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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 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	

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)	tonne	0.125	0.125	0.125	
		Add 0.50 percent cost of material for Spacers, Insulation tape and miscellaneous items					
		b) Labour					
		i) For making and fixing cables, anchorages					
		Mate	day	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		ii) For prestressing					
		Mate/ Supervisor	day	0.050	0.050	0.050	
		Prestressing operator / Fitter	day	0.250	0.250	0.250	
		Mazdoor	day	1.000	1.000	1.000	
		iii) For grouting					
		Mate/ Supervisor	day	0.050	0.050	0.050	
		Mason	day	0.250	0.250	0.250	
		Mazdoor	day	1.000	1.000	1.000	
		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					
14.04	**2702**	**Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications**					
		Unit = 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	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+d)**	**@ on (a+b+c+d)**	**@ on (a+b+c+d)**	
		Rate per cum (a+b+c+d)					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.05	**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 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	0.490	0.490	0.490	
		Mazdoor	day	11.000	11.000	11.000	
		Mazdoor (Skilled)	day	1.250	1.250	1.250	
		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	

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 (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 CRRI for a specific case)					
		i) Bitumen 80/100 or 60/70 or 30/40 @ 10.2 percent by weight of mix. 2 x 10.2/100 = 0.204	tonne	0.204	0.204	0.204	
		ii) Crusher stone dust @ 31.9 percent by weight of mix = 2 x 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 x 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 x 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 = 72.46x0.005/10 = 0.036	cum	0.036	0.036	0.036	
		vi) Bitumen for coating of chips @ 2 percent by weight = 0.036 x 1.456 x 2/100 = 0.001048MT = 1.05kg	kg	1.050	1.050	1.050	
		d) Overhead charges		**@ on (a+b) @ on (a+b+c+d)**	**@ on (a+b) @ on (a+b+c+d)**	**@ on (a+b) @ on (a+b+c+d)**	
		e) Contractor's profit					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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. 4. This rate analysis is based on design made by CRRI 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 MoRT&H 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 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,	cum	4.092	4.092	4.092	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Concrete in hand rails = 0.03 x 72 = 2.16 cum, Total Concrete = 1.932 + 2.16 = 4.092 cum.					
		Add 5 percent of 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 MoRT&H 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 concreteM30 Grade Refer relevant item of concrete in Item 14.01(C) by using batching plant, excluding formwork i.e. per cum basic	cum	4.092	4.092	4.092	

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

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		cost of material for painting one shop coat with red oxide primer and three coats of synthetic 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	2.800	2.800	2.800	
		Mazdoor (Skilled)	day	30.000	30.000	30.000	
		Mazdoor	day	40.000	40.000	40.000	
		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 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	0.020	0.020	0.020	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	0.020	0.020	0.020	
		For fixing in position					
		Mate	day	0.008	0.008	0.008	
		Mason	day	0.010	0.010	0.010	
		Mazdoor	day	0.200	0.200	0.200	
		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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
14.11	**1500,1600,1700 & 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 concreteM30 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. 13.8 (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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.12	**1600**	**Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC)** **Unit = 1 MT** **Taking output = 1 MT** 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 MoRT&H circular /specification.					
14.13	**1800 & 2300**	**Precast - pretensioned Girders** **Providing, pre-casting, transportation and placing in position precast pre-tensioned concrete girders as per drawing and technical specifications** **Unit = 1 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	
		Water for curing	Kl	0.525	0.525	0.525	
		HYSD steel.	tonne	0.100	0.100	0.100	
		HT strand with 5 percent as wastage and extra length for anchoring	tonne	0.060	0.060	0.060	
		LDO for steam curing	Litre	37.000	37.000	37.000	
		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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Taking quantity of steel 100 Kg/cum of concrete including laps and wastage					
		Mate	day	0.070	0.070	0.070	
		Mazdoor (Skilled)	day	0.350	0.350	0.350	
		Mazdoor	day	1.400	1.400	1.400	
		(ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc.., prestessing and cutting of extra length of HT strand after de-stressing.					
		Taking quantity of HT strand 60 Kg/cum					
		Mate	day	0.026	0.026	0.026	
		Mazdoor (Skilled)	day	0.140	0.140	0.140	
		Mazdoor	day	0.500	0.500	0.500	
		(iii) Erection and dismantling of shuttering					
		Taking shuttering area 10 sqm/cum of concrete					
		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 trailor					
		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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	2.5 x L	2.5 x L	2.5 x L	
		For unloading	hour	0.022	0.022	0.022	
		Hydraulic Boom placer pump	hour	0.022	0.022	0.022	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.004 x L1 + 0.022			
		(ii) 12 KL capacity	hour		0.005 x L1 + 0.029		
		(iii) 6 KL capacity	hour			0.01 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. (L - Lead in Kilometer)	tonne.km	2.5xL	2.5xL	2.5xL	
		Trailor 30 tonne capacity during placement.	hour	0.150	1.150	2.150	
		Cost of formwork, steam curing arrangement, pre-tensioning 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)					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.14	1700 & 1800	**Providing and fixing Helical pipes in voided concrete slabs**					
		Unit = 1 RM					
		Taking output = 1 RM					
		a) Material					
		Helical pipes 600mm diameter	metre	1.000	1.000	1.000	
		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	cum	2.540	2.540	2.540	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(Area-0.254 Sqm. /Meter) (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	0.229	0.229	0.229	
		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) (Rate taken from item No. 14.01 E (p) including OH & CP)	cum	2.980	2.980	2.980	
		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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 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	0.060	0.060	0.060	
		Mazdoor	day	1.500	1.500	1.500	
		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	

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

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		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					
		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	**(iii)**	**Providing and fixing in position 20 mm thick pre-moulded 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					
		Pre-moulded 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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					
		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 (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	**2608**	**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	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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/sqm including 5 percent wastage	kg	113.000	113.000	113.000	
		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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		2605 of MoRT&H 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					
		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	metre	12.000	12.000	12.000	
		Add 5 percent of cost of material for anchorage reinforcement, welding and other incidentals.					
		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	**2600**	**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**					

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

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

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

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 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	0.070	0.070	0.070	
		Mazdoor	day	1.250	1.250	1.250	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		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	
		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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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.**					
		a) Labour					
		Mate	day	0.006	0.006	0.006	
		Painter	day	0.100	0.100	0.100	
		Mazdoor	day	0.050	0.050	0.050	
		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 minutes 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)**					
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 conforms to following –					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 than 5 mpy iv. ASTM G3- Polarization test by Tafel test indicating Rebar weight loss of less than 5 mpy **Unit = Cum.** **Taking output=100.000 Cum**					
		a) Material					
		Corrosion Inhibiting Admixture @ 3 kg per cubic Meter	Kg.	300.000	300.000	300.000	
		b) Overhead charges		**@ on (a)**	**@ on (a)**	**@ on (a)**	
		c) Contractor's profit		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	
		Cost for 100 Sqm. = a+b+c **Rate per Sqm = (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	Tonne	17.992	17.992	17.992	
		Nuts & bolts	Kg	180.000	180.000	180.000	
		b) Labour (for cutting, bending, making holes, joining, welding and erecting in position)					
		Mate	day	21.097	21.097	21.097	
		Fitter	day	77.108	77.108	77.108	
		Blacksmith	day	77.108	77.108	77.108	
		Welder	day	77.108	77.108	77.108	
		Painter I class	day	32.385	32.385	32.385	
		Mazdoor	day	263.708	263.708	263.708	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Electrodes, cutting gas and other consumables @ 10 percent of cost of **(a) above**					
		c) Machinery					
		Mobile Hydraulic Crane 10 tonne capacity (For Fabrication)	Hrs	68.540	68.540	68.540	
		Crane 35 tonne capacity (For Loading & Unloading @ 1 hr for each operation)	Hrs	4.000	4.000	4.000	
		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.

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	0.140	0.140	0.140	
			Mazdoor	day	3.500	3.500	3.500	
			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	0.180	0.180	0.180	
			Mazdoor	day	4.500	4.500	4.500	
			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	0.240	0.240	0.240	
			Mazdoor	day	6.000	6.000	6.000	

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	0.320	0.320	0.320	
			Mazdoor	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			For excavation					
			(i) 1.2 cum bucket capacity	hour	4.627			
			(ii) 1.1 cum bucket capacity	hour		5.329		
			(iii) 0.9 cum bucket capacity	hour			7.450	
			For backfilling (considering 60% of the excavated material)					
			(i) 1.2 cum bucket capacity	hour	2.776			
			(ii) 1.1 cum bucket capacity	hour		3.197		
			(iii) 0.9 cum bucket capacity	hour			4.470	
			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					

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	0.320	0.320	0.320	
			Mazdoor	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			For excavation					
			(i) 1.2 cum bucket capacity	hour	4.674			
			(ii) 1.1 cum bucket capacity	hour		5.383		
			(iii) 0.9 cum bucket capacity	hour			7.525	
			For backfilling (considering 60% of the excavated material)					
			(i) 1.2 cum bucket capacity	hour	2.804			
			(ii) 1.1 cum bucket capacity	hour		3.230		
			(iii) 0.9 cum bucket capacity	hour			4.515	
			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					
15.01	B	(iii)	**Mechanical Means (Depth above 6 m)**					
			Unit = cum					
			Taking output = 270 cum					
			a) Labour					
			Mate	day	0.320	0.320	0.320	
			Mazdoor	day	8.000	8.000	8.000	
			b) Machinery					
			Hydraulic Excavator					
			For excavation					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	4.732			
		(ii) 1.1 cum bucket capacity	hour		5.450		
		(iii) 0.9 cum bucket capacity	hour			7.619	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	2.839			
		(ii) 1.1 cum bucket capacity	hour		3.270		
		(iii) 0.9 cum bucket capacity	hour			4.571	
		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					
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	0.200	0.200	0.200	
		Mazdoor	day	5.000	5.000	5.000	
		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.

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
15.01		B	**Mechanical Means**					
			Unit = cum					
			Taking output = 50 cum					
			a) Labour					
			Mate	day	0.120	0.120	0.120	
			Mazdoor	day	3.000	3.000	3.000	
			b) Machinery					
			Hydraulic Excavator					
			Excavator for excavation					
			(i) 1.2 cum bucket capacity	hour	5.818			
			(ii) 1.1 cum bucket capacity	hour		6.845		
			(iii) 0.9 cum bucket capacity	hour			7.273	
			For loading					
			(i) 1.2 cum bucket capacity	hour	0.872			
			(ii) 1.1 cum bucket capacity	hour		1.005		
			(iii) 0.9 cum bucket capacity	hour			1.405	
			Jack Hammer	hour	5.818	6.845	7.273	
			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	0.872			
			(ii) 14 cum capacity	hour		1.005		
			(iii) 10 cum capacity	hour			1.405	
			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**					
			Unit = cum					
			Taking output = 10 cum					
			a) Labour					
			Mate	day	0.350	0.350	0.350	
			Driller	day	0.500	0.500	0.500	
			Blaster	day	0.250	0.250	0.250	
			Mazdoor	day	8.000	8.000	8.000	

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	0.210	0.210	0.210	
			Mazdoor	day	3.000	3.000	3.000	
			Driller	day	2.000	2.000	2.000	
			Blaster	day	0.250	0.250	0.250	
			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	1.024	1.024	1.024	
			Hydraulic Excavator					
			Excavator for excavation					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	1.024			
		(ii) 1.1 cum bucket capacity	hour		1.024		
		(iii) 0.9 cum bucket capacity	hour			1.024	
		For loading					
		(i) 1.2 cum bucket capacity	hour	2.094			
		(ii) 1.1 cum bucket capacity	hour		2.411		
		(iii) 0.9 cum bucket capacity	hour			3.371	
		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	2.094			
		(ii) 14 cum capacity	hour		2.411		
		(iii) 10 cum capacity	hour			3.371	
	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 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					

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	0.080	0.080	0.080	
		Mazdoor	day	2.000	2.000	2.000	
		b) Machinery					
		Jack Hammer	hour	5.973	7.467	9.190	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	5.973			
		(ii) 1.1 cum bucket capacity	hour		7.467		
		(iii) 0.9 cum bucket capacity	hour			9.190	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.611			
		(ii) 1.1 cum bucket capacity	hour		0.703		
		(iii) 0.9 cum bucket capacity	hour			0.983	
		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	0.611			
		(ii) 14 cum capacity	hour		0.703		
		(iii) 10 cum capacity	hour			0.983	
		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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Labour					
		Mate/Supervisor	day	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		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 15.01 (i) to (iv) for ordinary soil					
15.01	**B**	**Mechanical Means**					
		Unit = cum					
		Taking output = 260 cum					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Hydraulic Excavator					
		(i) 1.2 cum bucket capacity	hour	8.506			
		(ii) 1.1 cum bucket capacity	hour		9.796		
		(iii) 0.9 cum bucket capacity	hour			13.695	
		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	8.506			
		(ii) 14 cum capacity	hour		9.796		
		(iii) 10 cum capacity	hour			13.695	
		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					

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	0.120	0.120	0.120	
		Mazdoor for dressing sides, bottom and backfilling	day	3.000	3.000	3.000	
		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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		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)**	

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 Ist 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	0.480	0.480	0.480	
			Mason	day	4.000	4.000	4.000	
			Mazdoor	day	8.000	8.000	8.000	
			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 = 1 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	0.036	0.036	0.036	

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			Mazdoor	day	0.900	0.900	0.900	
			Total Material and Labour = (a+b)					-
	Sub-analysis (Addl.)	(B)	**Cement Mortar1:2 (1cement :2 sand)**					
			Unit = 1 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	0.036	0.036	0.036	
			Mazdoor	day	0.900	0.900	0.900	
			Total Material and Labour = (a+b)					-
	Sub-analysis (Addl.)	(C)	**Cement Mortar1:4 (1cement :4 sand)**					
			Unit = 1 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	0.036	0.036	0.036	
			Mazdoor	day	0.900	0.900	0.900	
			Total Material and Labour = (a+b)					-
	Sub-analysis (Addl.)	(D)	**Cement Mortar1:6 (1cement :6 sand)**					
			Unit = 1 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	0.036	0.036	0.036	
			Mazdoor	day	0.900	0.900	0.900	
			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)**					

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.x0.24mx0.24mx0.39m = 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	1.500	1.500	1.500	
			b) Labour					
			Mate	day	0.660	0.660	0.660	
			Mason	day	7.500	7.500	7.500	
			Mazdoor	day	9.000	9.000	9.000	
			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 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	0.600	0.600	0.600	
			Mason	day	6.000	6.000	6.000	
			Mazdoor	day	9.000	9.000	9.000	
			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 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Bricks Ist class	each	500.000	500.000	500.000	
		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	0.064	0.064	0.064	
		Mason	day	0.800	0.800	0.800	
		Mazdoor	day	0.800	0.800	0.800	
		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	0.040	0.040	0.040	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	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 10 sqm (a+b+c+d)					

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	0.040	0.040	0.040	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	0.500	0.500	0.500	
		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)**	
	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 (7no.x0.24mx0.24mx0.39m = 0.16 cu.m)	No	7.000	7.000	7.000	

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	0.330	0.330	0.330	
		Water for curing	KL	0.966	0.966	0.966	
		b) Labour					
		Mate	day	0.096	0.096	0.096	
		Mason	day	1.200	1.200	1.200	
		Mazdoor	day	1.200	1.200	1.200	
		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		
		(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	0.120	0.120	0.120	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.500	1.500	1.500	
		Add for scaffolding @ 5 percent of cost of material and labour					

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.x0.24mx0.24mx0.39m = 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	0.200	0.200	0.200	
		Mason	day	2.500	2.500	2.500	
		Mazdoor	day	2.500	2.500	2.500	
		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		

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	0.113	0.113	0.113	
			Mason	day	1.500	1.500	1.500	
			Mazdoor	day	1.325	1.325	1.325	
			c) Machinery					
			Transit truck agitator					
			For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
			For unloading	hour	0.650	0.650	0.650	
			Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
			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					

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 (Rate taken from sub-analysis items 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					
		Mate	day	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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**					

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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	

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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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 (Rate taken from sub-analysis items 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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		

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 + 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** **Unit = cum** **Taking output = 15 cum**					
		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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 x L1 + 0.875	
		d) Formwork @ 10 percent on cost of concrete i.e. cost of material, labour and machinery					

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 (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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					

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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					

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	0.113	0.113	0.113	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	1.325	1.325	1.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	

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	0.380	0.380	0.380	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	8.000	8.000	8.000	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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 (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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		

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 + 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**					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis items 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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.055 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.073 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.146 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					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Rate per cum = (a+b+c+d+e+f)/15					
15.11	**I**	**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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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					
		Taking output = 15 cum					

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 21.12)	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	0.420	0.420	0.420	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	9.000	9.000	9.000	
		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 @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.104 x L1 + 0.625			
		(ii) 12 KL capacity	hour		0.139 x L1 + 0.833		
		(iii) 6 KL capacity	hour			0.278 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	

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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	

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	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.650	0.650	0.650	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		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		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.153	0.153	0.153	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	2.325	2.325	2.325	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.650	0.650	0.650	
		Hydraulic Boom placer pump	hour	0.650	0.650	0.650	
		Water tanker (speed @20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					

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 + 0.656			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 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	0.160	0.160	0.160	
		Blacksmith	day	1.000	1.000	1.000	
		Mazdoor	day	3.000	3.000	3.000	
		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 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		

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(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					
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 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) Average length of weep hole is taken as one metre for the purpose of estimating.	metre	31.500	31.500	31.500	
		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	0.030	0.030	0.030	
		Mason	day	0.500	0.500	0.500	
		Mazdoor	day	0.250	0.250	0.250	
		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 30 nos. = 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.					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.15	**2700**	**PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification**					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Case I PCC Grade M15 using batching plant & Concrete pump					
		a) Material					
		Concrete, Item No - 15.11 (A), Case-I excluding formworks	cum	1.000			
		Concrete, Item No - 15.11 (A), Case-I excluding formworks			1.000		
		Concrete, Item No - 15.11 (A), Case-I excluding formworks				1.000	
		b) Overhead charges		**@ on (a)**	**@ on (a)**	**@ on (a)**	
		c) Contractor's profit		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	
		Cost for 1 Cum = a+b+c					
		Rate per Cum (a+b+c)					
		b) Material					
		Case II PCC Grade M15 using batching plant & manual placing					
		Concrete, Item No - 15.11 (A), Case-II excluding formworks	cum	1.000			
		Concrete, Item No - 15.11 (A), Case-II excluding formworks			1.000		
		Concrete, Item No - 15.11 (A), Case-II excluding formworks				1.000	
		b) Overhead charges		**@ on (a)**	**@ on (a)**	**@ on (a)**	
		c) Contractor's profit		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	
		Cost for 1 Cum = a+b+c					
		Rate per Cum (a+b+c)					
15.16	**1500, 1600, 1700 & 2704**	**Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification**					
		Unit = cum					
		Taking output = 1 cum					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Material					
		Cement concrete M30 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)	cum	1.000	1.000	1.000	
		Added at the rate of 2 percent of cost					
		HYSD bar reinforcement Rate as per item No 9.16 (Excluding OH & CP)	tonne	0.050	0.050	0.050	
		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 = 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	0.020	0.020	0.020	
		Mazdoor	day	0.020	0.020	0.020	
		For fixing in position					
		Mate	day	0.008	0.008	0.008	
		Mason	day	0.010	0.010	0.010	
		Mazdoor	day	0.200	0.200	0.200	
		Add @ 5 percent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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.					
15.18	**2702**	**Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications** **Unit = cum** **Taking output = 1 cum**					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 15.12 (C) excluding formwork	cum	1.000	1.000	1.000	
		HYSD bar reinforcement Rate as per item No 15.13 (Excluding OH & CP)	tonne	0.075	0.075	0.075	
		b) Labour					
		Mazdoor for cleaning deck slab concrete surface.	day	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 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**					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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.					
		Unit = sqm					
		Taking output = 72.46 sqm (2 tonnes)(0.869 cum) assuming a density of 2.3 tonnes/cum.					
		a) Labour					
		Mate	day	0.490	0.490	0.490	
		Mazdoor	day	11.000	11.000	11.000	
		Mazdoor (Skilled)	day	1.250	1.250	1.250	
		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 CRRI for a specific case)					

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 x 10.2/100 = 0.204	tonne	0.204	0.204	0.204	
		ii) Crusher stone dust @ 31.9 percent by weight of mix = 2 x 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 x 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 x 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 = 72.46x0.005/10 = 0.036	cum	0.036	0.036	0.036	
		vi) Bitumen for coating of chips @ 2 percent by weight = 0.036 x 1.456 x 2/100 = 0.001048MT = 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.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 CRRI 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 MoRT&H 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	0.020	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)**	
		Cost for 10 sqm (a+b+c+d)					
		Rate per sqm (a+b+c+d)/10					

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	0.040	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.	kg	55.000	55.000	55.000	
		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					
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	0.008	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	sqm	3.000	3.000	3.000	

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges **d) Contractor's profit** Cost for 12 m = (a+b+c+d) **Rate per m = (a+b+c+d)/12**		**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	
15.22	**(iii)**	**Providing and fixing in position 20 mm thick pre-moulded 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					
		Pre-moulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.600	3.600	3.600	
		c) Overhead charges **d) Contractor's profit** Cost for 12 m = (a+b+c+d) **Rate per m = (a+b+c+d)/12**		**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	**@ on (a+b) @ on (a+b+c)**	
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	0.024	0.024	0.024	
		Mazdoor	day	0.500	0.500	0.500	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		b) Material					
		Sand Volume 12 x 0.1 x 0.01 = 0.012 cum	cum	0.012	0.012	0.012	

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 (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					
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	0.280	0.280	0.280	
		Mazdoor	day	7.000	7.000	7.000	
		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					
15.23		**B Sandy material**					
		a) Labour					
		Mate	day	0.280	0.280	0.280	
		Mazdoor for filling, watering, ramming etc.	day	7.000	7.000	7.000	
		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	

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 MoRT&H 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	0.320	0.320	0.320	
		Mazdoor for filling, watering, ramming etc.	day	7.000	7.000	7.000	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRT&H 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					
15.25		**Painting with synthetic enamel paint bridge No. and span arrangements**					
		Painting two coats after filling the surface with synthetic enamel paint					

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		bridge No. and span arrangements as per as directed by Engineer. **Unit = Nos.** **Taking output = 1 Nos.**					
		a) Labour					
		Mate	day	0.006	0.006	0.006	
		Painter	day	0.100	0.100	0.100	
		Mazdoor	day	0.050	0.050	0.050	
		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 minutes 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 C M 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 in anticipated. These structures can adjust in minor settlements, being flexible structures, without loosing their functional requirement.

Sr No	Ref. to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
16.01	**2503**	**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.**					
	A	**Boulder Laid Dry Without Wire Crates.**					
		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	0.044	0.044	0.044	
		Mason	day	0.350	0.350	0.350	
		Mazdoor *	day	0.750	0.750	0.750	
		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)					
	*	Including excavation for trimming for preparation of bed.					
	Note	Nominal excavation required for preparation of bed has been taken into account while making provision for labour.					
16.02	**2503**	**Boulder Apron Laid in Wire Crates**					
		Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10 percent extra for laps and joints laid with stone boulders weighing not less than 40 kg each					
		Unit = cum					
		Taking output = 3 m x 1.5m x 1.25m = 5.63 cum					
		a) Material					
		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	
		b) Labour					
		Mate	day	0.180	0.180	0.180	
		Mazdoor (Skilled)	day	1.500	1.500	1.500	
		Mazdoor*	day	3.000	3.000	3.000	

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 (Rate taken from Items 12.08 A, Case II) including OH & CP	cum	1.000	1.000	1.000	
		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	
		Stone spalls of minimum 25	cum	0.200	0.200	0.200	

Sr No	Ref. to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
			mm size					
			b) Labour					
			Mate	day	0.044	0.044	0.044	
			Mason	day	0.350	0.350	0.350	
			Mazdoor	day	0.750	0.750	0.750	
			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 (Rate taken from items 12.08 A, Case II) including OH & CP	cum	1.000	1.000	1.000	
			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	0.050	0.050	0.050	
			Mazdoor (Skilled)	day	0.250	0.250	0.250	
			Mazdoor *	day	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 cum = (a+b+c+d)					
			Includes Mazdoor required for trimming of slope to proper profile and preparation of bed.					

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	0.016	0.016	0.016	
		Mazdoor	day	0.300	0.300	0.300	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		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					

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 (Rate taken from items 21.01 A)	cum	0.133	0.133	0.133	
		b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.08 (A) including OH & CP. 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.	cum	0.333	0.333	0.333	
		c) Material					
		Stone	cum	1.000	1.000	1.000	
		Stone Spalls	cum	0.200	0.200	0.200	
		d) Labour					
		Mate	day	0.080	0.080	0.080	
		Mason	day	0.500	0.500	0.500	
		Mazdoor (for laying stones, filling of quarry spalls)	day	1.500	1.500	1.500	
		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)					
	*	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) Add 1 percent of cost to account for excavation for preparation of bed.	cum	0.330	0.330	0.330	
		Rate per cum					

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	0.080	0.080	0.080	
			Mason	day	0.500	0.500	0.500	
			mazdoor	day	1.500	1.500	1.500	
			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** ***Unit = cum*** ***Taking output = 1 cum***					
		A	**Stone masonry in cement mortar (1:3)**					
			Coursed rubble masonry (1st sort)(Rate taken from items 12.07 A) including OH & CP	cum	1.000	1.000	1.000	
			Rate same as per item No. 12.7 (A) including OH & CP **Rate per cum**					
			or					
16.10		**B**	**Cement concrete Grade M15**					
			Concrete Grade M15 (Rate taken from items 12.08 A) including OH & CP **Rate per cum**	cum	1.000	1.000	1.000	
		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**					

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	0.050	0.050	0.050	
		Mason	day	0.250	0.250	0.250	
		Mazdoor	day	1.000	1.000	1.000	
		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	0.280	0.280	0.280	
		Mazdoor	day	5.000	5.000	5.000	
		Mazdoor (Skilled)	day	2.000	2.000	2.000	
		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	

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	0.140	0.140	0.140	
		Mazdoor	day	2.500	2.500	2.500	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		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)**	

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 6.00 cum (a+b+c+d)					
		Rate per cum (a+b+c+d)/6.00					
	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.					
16.14	**2503**	Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of ± 2%) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedge with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.					
		Unit = cum					
		Taking output = 2 x 1 x 1 m = 2 cum					
		a) Material					
		Crates made of Mesh type 10x12 (D=100 mm) Zn coated. (Mesh wire diameter 3.00 mm). Surface area required = 11.00 sqm.	sqm	11.000	11.000	11.000	
		Stone boulder with least dimension 200mm	cum	2.000	2.000	2.000	
		b) Labour					
		Mate	day	0.080	0.080	0.080	
		Mason (for plain stone work) 2nd class	day	0.500	0.500	0.500	
		Mazdoor *	day	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 2 cum (a+b+c+d)					
		Rate per cum (a+b+c+d)/2					

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	0.096	0.096	0.096	
		Mazdoor	day	1.800	1.800	1.800	
		Mazdoor (skilled)	day	0.600	0.600	0.600	
		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	0.130	0.130	0.130	
		Concrete Pump	hour	0.130	0.130	0.130	
		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

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.01	**2811**	**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** **Unit = Sqm (Thickness 75 mm)** **Taking output = 10 sqm**					
		a) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		b) Machinery					
		Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories.	hour	1.000	1.000	1.000	
		Tractor-trolley.	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 sqm = (a+d+c+d)					
		Rate per sqm = (a+b+c+d)/10					
17.02	**2811**	**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.** **Unit = Sqm** **Taking output = 10 sqm**					
		a) Labour					
		Mate	day	0.030	0.030	0.030	
		Mazdoor	day	0.750	0.750	0.750	
		b) Machinery					
		Air Compressor 250 cfm with pneumatic breaker.	hour	0.750	0.750	0.750	
		Tractor-trolley.	hour	0.400	0.400	0.400	
		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 sqm = (a+d+c+d)					
		Rate per sqm = (a+b+c+d)/10					
17.03	**2807**	**Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification** **Unit = Sqm** **Taking output = 1 sqm**					

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	0.007	0.007	0.007	
		Mason	day	0.040	0.040	0.040	
		Mazdoor	day	0.140	0.140	0.140	
		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	0.006	0.006	0.006	
		Mazdoor (Skilled) labour for drilling	day	0.080	0.080	0.080	
		Mazdoor (Skilled) labour for fixing nipple and sealing inlets	day	0.080	0.080	0.080	
		Mazdoor for cutting and removing of nipples	day	0.040	0.040	0.040	
		Add 10 percent of labour cost for drilling holes etc.					
		c) Overhead charges		**@ on (a+b)**	**@ on (a+b)**	**@ on (a+b)**	

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	0.008	0.008	0.008	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		Mazdoor	day	0.100	0.100	0.100	
		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	0.008	0.008	0.008	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		Mazdoor	day	0.100	0.100	0.100	
		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)					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.06	2800	**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.**					
		Unit = sqm					
		Taking output = 10 sqm for an average thickness of 25 mm.					
		a) Labour					
		Mate	day	0.060	0.060	0.060	
		Mazdoor (Skilled)	day	0.750	0.750	0.750	
		Mazdoor	day	0.750	0.750	0.750	
		b) Material					
		Pre-packed polymer concrete based on epoxy system complete with curing compound, intiator and promoter including 5 percent wastage.	kg	315.000	315.000	315.000	
		c) Machinery					
		Grout pump with agitator and accessories	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					
	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	**Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.**					
		Unit = kg					
		Taking output = 1 kg					
		a) Material					
		Epoxy including 10 percent wastage	kg	1.100	1.100	1.100	
		b) Labour					
		Mate	day	0.008	0.008	0.008	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
		Mazdoor	day	0.100	0.100	0.100	
		c) Machinery					
		Epoxy Injection gun	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)					

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.08	2804	**Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification**					
		Unit = sqm					
		Taking output = 10 sqm					
		Assume average 10mm thickness of epoxy mortar					
		a) Material					
		Epoxy resin-hardener mix for prime coat	kg	2.500	2.500	2.500	
		Epoxy mortar	kg	2.200	2.200	2.200	
		Epoxy resin -hardener mix for seal coat.	kg	2.000	2.000	2.000	
		Add 3 percent cost of material for other consumables like acetone etc. and to cover wastage.					
		b) Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		Mazdoor	day	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 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
17.09	2807	**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.**					
		Unit = sqm					
		Taking output = 10 sqm,					
		40 mm average thickness.					
		a) Labour					
		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) Machinery					
		Air compressor 250 cfm	hour	1.000	1.000	1.000	
		Shotcreting equipment	hour	1.000	1.000	1.000	

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 (a+b+c)**	**@ on (a+b+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					
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	0.040	0.040	0.040	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		Mazdoor	day	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 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	0.040	0.040	0.040	
		Mazdoor (Skilled)	day	0.500	0.500	0.500	
		Mazdoor	day	0.500	0.500	0.500	

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 prestessing 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	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	0.240	0.240	0.240	
		Mazdoor Semi-skilled)	day	3.000	3.000	3.000	
		Mazdoor	day	3.000	3.000	3.000	
		ii) For making and fixing anchorages for cables and placement of cables.					
		Mate	day	0.440	0.440	0.440	
		Blacksmith	day	3.000	3.000	3.000	
		Mazdoor	day	8.000	8.000	8.000	
		iii) For prestressing					
		Mate/Supervisor	day	0.134	0.134	0.134	
		Fitter	day	0.700	0.700	0.700	
		Mazdoor	day	2.650	2.650	2.650	
		iv) For grouting					
		Mate/Supervisor	day	0.134	0.134	0.134	
		Mason	day	0.700	0.700	0.700	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	2.650	2.650	2.650	
		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 (a+b+c)**	**@ on (a+b+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)					
17.13	**2812**	**Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestessing 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	8.000	8.000	8.000	
		Mazdoor	day	8.000	8.000	8.000	
		ii) For making and fixing anchorages for cables and placement of cables.					
		Mate	day	1.280	1.280	1.280	
		Blacksmith	day	7.000	7.000	7.000	
		Mazdoor	day	25.000	25.000	25.000	
		iii) For prestressing					
		Mate/Supervisor	day	0.200	0.200	0.200	
		Fitter	day	1.000	1.000	1.000	
		Mazdoor	day	4.000	4.000	4.000	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		iv) For grouting					
		Mate/Supervisor	day	0.260	0.260	0.260	
		Mason	day	1.500	1.500	1.500	
		Mazdoor	day	5.000	5.000	5.000	
		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 (a+b+c)**	**@ on (a+b+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 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 prestessing 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	1.720	1.720	1.720	
		Mazdoor Semi-skilled)	day	18.000	18.000	18.000	
		Mazdoor	day	25.000	25.000	25.000	
		ii) For making and fixing anchorages for cables and placement of cables.					
		Mate	day	4.000	4.000	4.000	
		Blacksmith	day	20.000	20.000	20.000	
		Mazdoor	day	80.000	80.000	80.000	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		iii) For prestressing					
		Mate/Supervisor	day	0.300	0.300	0.300	
		Fitter	day	1.500	1.500	1.500	
		Mazdoor	day	6.000	6.000	6.000	
		iv) For grouting					
		Mate/Supervisor	day	1.000	1.000	1.000	
		Mason	day	5.000	5.000	5.000	
		Mazdoor	day	20.000	20.000	20.000	
		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 (a+b+c)**	**@ on (a+b+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 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 = No					
		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	0.640	0.640	0.640	
		Mazdoor (Skilled)	day	4.000	4.000	4.000	
		Mazdoor	day	12.000	12.000	12.000	
		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 (a+b+c)**	**@ on (a+b+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 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 = 1 No					
		Taking output = 3 No.					
		Lifting of superstructure span by jacking up from below i.e. by placing the jacks					

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	0.640	0.640	0.640	
		Mazdoor (Skilled)	day	4.000	4.000	4.000	
		Mazdoor	day	12.000	12.000	12.000	
		b) Machinery					
		i) Hire charges for jack of 40 tonne lifting capacity.	each	3.000	3.000	3.000	
		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 (a+b+c)**	**@ on (a+b+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 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 are on the same side of the span.					
17.17		**Replacement of Expansion Joints complete as per drawings**					
		Unit -1 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	0.260	0.260	0.260	
		Mazdoor	day	6.000	6.000	6.000	
		Mazdoor (Skilled)	day	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 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.					

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	0.200	0.200	0.200	
		Mazdoor	day	5.000	5.000	5.000	
		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	0.400	0.400	0.400	
		Mazdoor	day	10.000	10.000	10.000	
		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	0.160	0.160	0.160	
		Mazdoor	day	4.000	4.000	4.000	

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	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
		* 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) This may be priced based on the rate given the chapter of superstructure.	cum	0.300	0.300	0.300	
		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)**	
		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	

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)A	tonne	0.013	0.013	0.013	
		b) Labour*					
		Mate	day	0.008	0.008	0.008	
		mazdoor	day	0.200	0.200	0.200	
		*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	0.016	0.016	0.016	
		Mazdoor (Skilled)	day	0.200	0.200	0.200	
		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)**	
		Cost of repair for10m = 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	

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mobile Bridge Inspection Unit (MBIU) 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)**	**@ 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 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
Contractor Profit :	10 percent of cost of works

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 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 (Ist 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.

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	0.040	
		Mazdoor	day	1.000	
		b) Machinery			
		Excavator 1.1 cum bucket capacity	hour	8.214	
		Jack Hammer	hour	8.214	
		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	0.040	
		Mazdoor	day	1.000	
		b) Machinery			
		Excavator 1.1 cum bucket capacity	hour	10.039	
		Jack Hammer	hour	10.039	
		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			

Sr No	Ref. to M.	Description	Unit	Quantity	Rate (Rs.)
18.03	304	**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	0.040	
		Mazdoor	day	1.000	
		b) Machinery			
		Excavator 1.1 cum bucket capacity	hour	5.024	
		Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	hour	5.024	
		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	0.320	
		Mazdoor	day	6.000	
		Mazdoor (Skilled)	day	2.000	
		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	
		Drifter rod	Nos	0.505	

Sr No	Ref. to M.	Description	Unit	Quantity	Rate (Rs.)
		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	100.000	
		Mazdoor	day	2500.000	
		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	0.800	
		Mazdoor	day	10.000	
		Mazdoor(Semi Skilled)	day	5.000	
		Welder	day	5.000	
		b) Machinery			
		Rotating Telehandlers	hour	37.180	
		c) Materials			
		ISMB 350	Tonne	20.732	

Sr No	Ref. to M.	Description	Unit	Quantity	Rate (Rs.)
		(Including 0.25% Wastage)			
		MS Channel ISMC 75	Tonne	3.830	
		(Including 0.25% Wastage)			
		MS Plate 200 x 200 x 12 mm	Tonne	1.504	
		(Including 0.25% Wastage)			
		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/mm2 and complete as per Drawing and Technical Specifications.			
		Unit = cum			
		Taking output = 120 cum			
		a) Labour			
		Mate	day	0.320	
		Mazdoor	day	8.000	
		b) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	1.333	
		Generator 250 KVA	hour	1.333	
		Loader 3.1 cum capacity	hour	1.333	
		Transit truck agitator			
		For transportation (6 cum Capacity)	tonne.km	300 x L	
		For loading & unloading	hour	11.333	
		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			

Sr No	Ref. to M.	Description	Unit	Quantity	Rate (Rs.)
18.08	2807	**Shotcreting with welded wire mesh**			
		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.			
		Unit = cum			
		Taking output = 120 cum			
		a) Labour			
		Mate	day	0.320	
		Mazdoor	day	8.000	
		b) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	1.333	
		Generator 250 KVA	hour	1.333	
		Loader 3.1 cum capacity	hour	1.333	
		Transit truck agitator			
		For transportation (6 cum Capacity)	tonne.km	300 x L	
		For loading & unloading	hour	11.333	
		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	
		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	
		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			
18.09	2806 & 3200	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.			
		Unit = Number			
		Taking output = 155 Nos.			
		a) Labour			
		Mate	day	0.480	
		Mazdoor	day	8.000	
		Mason (IInd class)	day	4.000	
		b) Machinery			
		Single boom Hydraulic Drill Jumbo	hour	25.833	

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	0.600	
		Mazdoor	day	10.000	
		Mason (IInd class)	day	5.000	
		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			

Sr No	Ref. to M.		Description	Unit	Quantity	Rate (Rs.)
			Taking output = 1.5 Tonne			
			a) Labour			
			Mate	day	0.080	
			Mazdoor	day	2.000	
			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 (Rate taken from sub-analysis -21.05)	cum	120.000	
			Water for curing	Kl	63.000	
			b) Labour			
			For pouring and placing			
			Mate	day	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 x L1 + 3.5	
			d) Formwork and staging 40 percent of (a+b+c)			
			e) Overhead charges @ on (a+b+c+d)			

Sr No	Ref. to M.		Description	Unit	Quantity	Rate (Rs.)
			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**	**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	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	

Sr No	Ref. to M.		Description	Unit	Quantity	Rate (Rs.)
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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	0.232	

Sr No	Ref. to M.		Description	Unit	Quantity	Rate (Rs.)
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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 15 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 (Rate taken from sub-analysis -21.13)	cum	120.000	
			Water for curing	Kl	63.000	
			b) Labour			
			For pouring and placing			
			Mate	day	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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			

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	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 x L1 + 3.5	

Sr No	Ref. to M.		Description	Unit	Quantity	Rate (Rs.)
			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**	**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	Kl	63.000	
			b) Labour			
			For pouring and placing			
			Mate	day	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1- lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	
			Hydraulic Boom placer pump	hour	2.600	
			Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
			(i) 12 KL capacity	hour	0.583 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	Kl	63.000	
			b) Labour			
			For pouring and placing			
			Mate	day	0.232	
			Mason	day	1.500	
			Mazdoor	day	4.300	
			c) Machinery			
			Transit truck agitator			
			For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
			For unloading	hour	2.600	

Sr No	Ref. to M.	Description	Unit	Quantity	Rate (Rs.)
		Hydraulic Boom placer pump	hour	2.600	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)			
		(i) 12 KL capacity	hour	0.583 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	0.160	
		Blacksmith	day	1.000	
		Mazdoor	day	3.000	
		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 L	
		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 & SAFETY MANAGEMENT AND 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 Ist 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	0.480	0.480	0.480	
		Mason	day	4.000	4.000	4.000	
		Mazdoor	day	8.000	8.000	8.000	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.017 x L1 + 0.101			
		(ii) 12 KL capacity	hour		0.022 x 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+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	0.060	0.060	0.060	
		blacksmith	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		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					

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	0.060	0.060	0.060	
		blacksmith	day	0.500	0.500	0.500	
		Mazdoor	day	1.000	1.000	1.000	
		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	0.016	0.016	0.016	
		Mazdoor skilled	day	0.100	0.100	0.100	
		Mazdoor	day	0.300	0.300	0.300	
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.008	0.008	0.008	
		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)**					

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	0.100	0.100	0.100	
		Mazdoor skilled	day	0.500	0.500	0.500	
		Mazdoor	day	2.000	2.000	2.000	
		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	0.120	0.120	0.120	
		Mazdoor for preparation of ground	day	3.000	3.000	3.000	
		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					

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	0.012	0.012	0.012	
		Mazdoor skilled	day	0.100	0.100	0.100	
		Mazdoor	day	0.200	0.200	0.200	
		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	0.120	0.120	0.120	
		Mazdoor for preparation of ground	day	3.000	3.000	3.000	
		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					

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	0.008	0.008	0.008	
		Mazdoor	day	0.200	0.200	0.200	
		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					

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	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					
19.11	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	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					
19.12	Suggestive		**Consent Approvals (Once)** **Unit = Number** **Taking output = One Number**					
19.12		**(i)**	a) 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					
19.12		**(ii)**	**a)** 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					
19.13	Suggestive		**Compliance submission for Consent Approvals** **(Half Yearly)** **Unit = Number** **Taking output = One Number**					

Sr No	Ref.to M.		Description	Unit	Quantity as per project category			Rate (Rs.)
					Large	Medium	Small	
19.13		(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					
19.13		(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	0.080	0.080	0.080	
			Mazdoor	day	2.000	2.000	2.000	
			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)**	
			e) Contractor's profit		**@ on (a+b+c+d)**	**@ on (a+b+c+d)**	**@ on (a+b+c+d)**	
			Cost for 100 Rm= a+b+c+d+e					
			Rate per Rm = (a+b+c+d+e)/100					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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***					
19.17	**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 Copies	5	5	5	
		Add 10 percent of cost of a+b+c as Miscellaneous work					

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 for Upto 50.00 Kilometer = (a+b+c+d+e)					
19.17	**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)					
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		162.000	162.000	162.000	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		for Site Visits.					
		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. ***Unit = Kilometer***					
19.18	**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					

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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)					
19.18	**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	
		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	

Sr No	Ref.to M.	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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)					
19.18	**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 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	

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

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
1	Dozer - 240 HP	Spreading Cutting Clearing	240	Hour	6273.000
2	Dozer - 175 HP	Spreading Cutting Clearing	175	Hour	4845.000
3	Dozer - 90 HP	Spreading Cutting Clearing	90	Hour	3336.000
4	Motor Grader 4.3 metre blade	Clearing Scarifying Spreading GSB WMM	186	Hour	5907.000
5	Motor Grader 3.7 metre blade	Clearing Scarifying Spreading GSB WMM	171	Hour	5419.000
6	Motor Grader 3.35 metre blade	Clearing Scarifying Spreading GSB WMM	110	Hour	4747.000
7	Hydraulic Excavator of 1.2 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	188	Hour	3293.000
8	Hydraulic Excavator of 1.1 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	162	Hour	2965.000
9	Hydraulic Excavator of 0.9 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	138	Hour	2689.000
10	Jack Hammer (attachment of Hydraulic Excavator)	For Drilling Purpose	-	Hour	206.000
11	Front End loader 3.1 cum bucket capacity	Soil loading Aggregate loading, etc.	221	Hour	4076.000
12	Front End loader 2.1 cum bucket capacity	Soil loading Aggregate loading, etc..	150	Hour	2515.000
13	Backhoe-loader 1 cum bucket capacity	Soil loading Aggregate loading, etc..	92	Hour	1717.000

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
14	Tipper-18 Cum	Transportation of Soil, GSB,WMM, Hot mix etc..	280	Hour	2746.000
15	Tipper-18 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	275	Per Tonne Km.	5.880
16	Tipper-18 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	275	Per Tonne Km.	7.151
17	Tipper-18 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hot mix etc..	275	Per Tonne Km.	14.300
18	Tipper-14 Cum	Transportation of Soil, GSB,WMM, Hot mix etc..	220	Hour	2435.000
19	Tipper -14 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	220	Per Tonne Km.	6.680
20	Tipper -14 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	220	Per Tonne Km.	8.120
21	Tipper -14 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hot mix etc..	220	Per Tonne Km.	16.230
22	Tipper-10 Cum	Transportation of Soil, GSB,WMM, Hot mix etc..	178	Hour	2166.000
23	Tipper -10 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	178	Per Tonne Km.	8.250
24	Tipper -10 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	178	Per Tonne Km.	10.030
25	Tipper -10 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hot mix etc..	178	Per Tonne Km.	20.060
26	Tipper-5.5 Cum	Transportation of Soil, GSB,WMM, Hot mix etc..	90	Hour	1649.000
27	Tipper- 5.5 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	90	Per Tonne Km.	11.310

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
28	Tipper- 5.5 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hot mix etc..	90	Per Tonne Km.	13.740
29	Tipper- 5.5 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hot mix etc..	90	Per Tonne Km.	27.480
30	Vibratory Soil Compactor (10 tonne)	Earth/Soil, GSB, WMM	99	Hour	2440.000
31	Smooth Wheeled Roller 8 tonne	Soil Compaction BM Compaction	98	Hour	1967.000
32	Tandem Roller	Rolling of Asphalt Surface	99	Hour	2429.000
33	Mini Tandem Roller	Earth/Soil	44	Hour	1369.000
34	Pneumatic Road Roller	Rolling of Asphalt Surface	114	Hour	2440.000
35	Water Tanker (16 KL)	Water Transport	150	Hour	1440.000
36	Water Tanker (12 KL)	Water Transport	150	Hour	1270.000
37	Water Tanker (6 KL)	Water Transport	100	Hour	967.000
38	Tractor-trolley	Pulling, Transportation, etc..	42	Hour	873.000
39	Rotavator	Scarifying	-	Hour	16.000
40	Ripper	Scarifying	-	Hour	21.000
41	Air Compressor -250 cfm	General Purpose	5	Hour	585.000
42	Air Compressor -500 cfm	General Purpose	148	Hour	2621.000
43	Integrated Stone Crusher Stone (3 Stage) 250 TPH	Crushing of Spalls	-	Hour	14744.000
44	Wet Mix Plant - 250 TPH Capacity	Wet Mix	-	Hour	878.000
45	Wet Mix Plant - 200 TPH Capacity	Wet Mix	-	Hour	583.000
46	Wet Mix Plant - 100 TPH Capacity	Wet Mix	-	Hour	558.000
47	Hot mix Plant - 200 TPH Capacity	DBM / BM / BC / Premix etc..	-	Hour	13938.000
48	Hot mix Plant - 160 TPH Capacity	DBM / BM / BC / Premix etc..	-	Hour	9846.000
49	Hot mix Plant - 120 TPH capacity	DBM / BM / BC / Premix etc..	-	Hour	7974.000
50	Batching and Mixing Plant - 240 cum Capacity	Concrete Mixing	-	Hour	6013.000

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
51	Batching and Mixing Plant - 120 cum Capacity	Concrete Mixing	-	Hour	3909.000
52	Mobile Concrete Batching / Mixing Plant	Concrete Mixing	60	Hour	937.000
53	Concrete Mixer - 0.4/0.28 cum	Concrete Mixing	10	Hour	487.000
54	Concrete Mixer - 1 cum	Concrete Mixing	15	Hour	525.000
55	Generator 725 KVA	Generation of Electric Energy	777	Hour	11044.000
56	Generator 500 KVA	Generation of Electric Energy	536	Hour	7640.000
57	Generator 400 KVA	Generation of Electric Energy	430	Hour	6162.000
58	Generator 250 KVA	Generation of Electric Energy	303	Hour	4344.000
59	Generator 125 KVA	Generation of Electric Energy	154	Hour	2277.000
60	Generator 100 KVA	Generation of Electric Energy	129	Hour	1944.000
61	Generator 62.5 KVA	Generation of Electric Energy	80	Hour	1250.000
62	Generator 33 KVA	Generation of Electric Energy	42	Hour	718.000
63	Generator 15 KVA	Generation of Electric Energy	20	Hour	405.000
64	Mechanical Broom Hydraulic	Surface Cleaning	50	Hour	1009.000
65	Bitumen Pressure Distributor	Applying bitumen tack coat	170	Hour	1647.000
66	Emulsion Pressure Distributor	Applying bitumen tack coat	170	Hour	1647.000
67	Bitumen Boiler Oil Fired	Bitumen Spraying	50	Hour	708.000
68	Mastic Cooker	Mastic Wearing Coat	10	Hour	636.000
69	Paver Finisher Mechanical	Paving of WMM	123	Hour	2463.000
70	Paver Finisher Hydrostatic with sensor control -240 HP	Paving of DBM / BM / BC / Premix etc..	240	Hour	8794.000
71	Paver Finisher Hydrostatic with sensor control -170 HP	Paving of DBM / BM / BC / Premix etc..	170	Hour	6971.000

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	26770.000
73	Paver Finisher Concrete with 241 HP Motor	Paving of Concrete Surface	241	Hour	17335.000
74	Paver Finisher Concrete with 118 HP Motor	Paving of Concrete Surface	118	Hour	4302.000
75	Texture Curing Machine (TCM) - upto 18 m	Texturing of Concrete Surface	55	Hour	4600.000
76	Texture Curing Machine (TCM) - upto 9 m	Texturing of Concrete Surface	55	Hour	3626.000
77	Hydraulic Chip Spreader	Surface Dressing	200	Hour	2115.000
78	Pot-Hole Repair Machine	Repair of pot-holes	178	Hour	1711.000
79	Transit Mixer - 6 Cum	Mix to Site Transportation of Concrete	178	Hour	2299.000
80	Concrete Pump	Pumping of Concrete	15	Hour	1278.000
81	Boom Placer	Pumping of Concrete	178	Hour	4192.000
82	Kerb Casting Machine	Kerb Making	50	Hour	1864.000
83	Piling Rig with Bentonite Pump	Piling in foundation	360	Hour	18807.000
84	Pneumatic Sinking Plant	Sinking Purpose	250	Hour	6591.000
85	Road marking machine	Road Marking	90	Hour	1859.000
86	Mobile Slurry Seal Equipment	Mixing and laying slurry seat	115	Hour	3808.000
87	Joint Cutting Machine	Cutting Purpose	5	Hour	487.000
88	Bar Bending & Cutting Machine	Bar Cutting & Bending	5	Hour	503.000
89	Needle Vibrator	Concrete pouring	5	Hour	562.000
90	Jack Hammer for air compressor	General Purpose	-	Hour	11.000
91	Plate Compactor	Compaction	8	Hour	569.000
92	Milling Machine with 1 meter Drum Width	Milling of bitumen surface	155	Hour	4557.000
93	Milling Machine with 1.2 meter Drum Width	Milling of bitumen surface	208	Hour	5326.000
94	Milling Machine With 1.3 meter Drum Width	Milling of bitumen surface	330	Hour	7625.000

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	11412.000
96	Cold in Situ recycling of bitumen's pavement with foam bitumen technology	Recycling of bitumen surface	602	Hour	29344.000
97	In situ stabilisation of WMM/GSB/Sub grade	Stabilisation of WMM/GSB/Sub grade	602	Hour	25468.000
98	Cement spreader	Spreading	350	Hour	7905.000
99	Mobile cold recycling mixing plant	Recycling of bitumen surface	300	Hour	21331.000
100	Hot in place recycling	Recycling of bitumen surface	322	Hour	103480.000
101	Pre heater unit for hot in place recycling	Recycling of bitumen surface	101	Hour	1211.000
102	Single boom Hydraulic Drill Jumbo	Drilling Purpose	78	Hour	5162.000
103	Two boom Hydraulic Drill Jumbo	Drilling Purpose	160	Hour	7829.000
104	Three boom Hydraulic Drill Jumbo	Drilling Purpose	240	Hour	11436.000
105	Hydraulic Rock bolt drill	Drilling Purpose	90	Hour	7417.000
106	Rotating Telehandlers	General Purpose	101	Hour	1150.000
107	Shotcrete Machine	Concreting Purpose	90	Hour	1743.000
108	Grouting machine	Grouting Purpose	8	Hour	760.000
109	Dewatering Pump 10 HP	Dewatering	10	Hour	313.000
110	Concrete cutting machine	Concrete cutting Purpose	5	Hour	214.000
111	Crawler mounted Crane 35 tonne capacity	Lifting Purpose	170	Hour	6029.000
112	Crawler mounted Crane 80 tonne capacity	Lifting Purpose	230	Hour	6267.000
113	Crawler mounted Crane 100 tonne capacity	Lifting Purpose	300	Hour	9503.000
114	Mobile Hydraulic Crane 3 tonne capacity	Lifting Purpose	42	Hour	1032.000
115	Mobile Hydraulic Crane 5 tonne capacity	Lifting Purpose	45	Hour	1075.000
116	Mobile Hydraulic Crane 10 tonne capacity	Lifting Purpose	48	Hour	1181.000
117	Mobile Hydraulic Crane 15 tonne capacity	Lifting Purpose	49	Hour	1218.000

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
118	Mobile Hydraulic Crane 20 tonne capacity	Lifting Purpose	101	Hour	1509.000
119	Mobile Hydraulic Crane 35 toone capacity	Lifting Purpose	173	Hour	2280.000
120	Concrete Bucket	For Purring Concrete		Hour	146.000
121	Prestressing Jack with Pump & Access (400 tonne)	Stressing of Steel Wires/Stands		Hour	533.000
122	Boat to carry at least 20 persons	General Purpose		hour	929.000
123	Crane with grab 0.75 cum capacity	Lifting Purpose		hour	1042.000
124	Epoxy Injection gun			hour	362.000
125	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking	Well sinking		hour	9594.000
126	Jack for Lifting 40 tonne lifting capacity	Lifting Purpose		hour	360.000
127	Vibrating Pile driving hammer complete with power unit and accessories	Pile driving		hour	17687.000
128	Transit Mixer - 6 Cum	Mix to Site Transportation of Concrete		Per Tonne Km.	12.770
129	Centrifugal water pump	Water Pumping		Hour	372.000
130	Shredding Machine	Shredding of waste Plastic		Hour	532.000
131	Mobile Bridge Inspection Unit (MBIU)	For Inspection of Bridge		Hour	7028.000
132	Network Survey Vehicle (NSV) With SUV	For Pavement Survey Purpose		Hour	6369.000
133	Falling weight deflectometer (FWD) Equipment With SUV	For Testing Purpose		Hour	3202.000
134	Retro reflectometer testing equipment with Vehicle With SUV	For Testing Retro reflection		Hour	1842.000
135	Sport utility vehicle (SUV)	General Purpose		Hour	1253.000
136	Automatic Vehicle Counter Classifier (ATCC) System	Traffic Counting		Hour	76.000

Note:- The usage rates given above are for the base year 2019-20 and derived based on the fuel & labour rate of Delhi 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	0.036	
			Mazdoor	day	0.900	
			c) Machinery			
			Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.019	
			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	0.036	
			Mazdoor	day	0.900	
			c) Machinery			
			Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.025	
			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	0.036	
			Mazdoor	day	0.900	
			c) Machinery			
			Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.015	
			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 Mortar1:6 (1cement :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	0.036	
		Mazdoor	day	0.900	
		c) Machinery			
		Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.011	
		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	0.320	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	7.000	
		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	0.167	
		Generator 250 KVA	hour	0.167	
		Loader 3.1 cum capacity	hour	0.362	
		Transit truck agitator			
		For loading & Unloading time	hour	0.167	
		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.)
		10 mm Aggregate	cum	32.400	
		Cost of water (Water/Cement Ratio - 0.4)	KL	39.600	
		b) Labour			
		Mate	day	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	

Sr No	Ref.to M.	Description	Unit	Quantity	Rate (Rs.)
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	

Sr No	Ref.to M.	Description	Unit	Quantity	Rate (Rs.)
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.3 % of Cement	Kg	452.520	
		Cost of water	KL	60.336	
		b) Labour			
		Mate	day	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	

Sr No	Ref.to M.	Description	Unit	Quantity	Rate (Rs.)
		b) Labour			
		Mate	day	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	

Sr No	Ref.to M.	Description	Unit	Quantity	Rate (Rs.)
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	

Sr No	Ref.to M.		Description	Unit	Quantity	Rate (Rs.)
			Loader 3.1 cum capacity	hour	8.679	
			Transit truck agitator			
			For loading & Unloading time	hour	4.000	
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.17			**RCC Grade M65 Using Batching Plant**			
			Unit = cum			
			Taking output = 450 cum			
			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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 120 cum/hour	hour	4.000	
			Generator 250 KVA	hour	4.000	
			Loader 3.1 cum capacity	hour	8.679	
			Transit truck agitator			
			For loading & Unloading time	hour	4.000	
			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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 240 cum/hour	hour	2.500	
			Generator 250 KVA	hour	2.500	
			Loader 3.1 cum capacity	hour	10.848	
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450			

Sr No	Ref.to M.		Description	Unit	Quantity	Rate (Rs.)
21.18	601	B	**Dry Lean Cement Concrete Sub- base Fly ash (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 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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 240 cum/hour	hour	2.500	
			Generator 250 KVA	hour	2.500	
			Loader 3.1 cum capacity	hour	10.848	
			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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	

Sr No	Ref.to M.		Description	Unit	Quantity	Rate (Rs.)
			c) Machinery			
			Batching Plant of capacity 120 cum/hour	hour	5.000	
			Generator 250 KVA	hour	5.000	
			Loader 3.1 cum capacity	hour	10.848	
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450			
21.18	**601**	**D**	**Dry Lean Cement Concrete Sub- base Fly ash (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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 120 cum/hour	hour	5.000	
			Generator 250 KVA	hour	5.000	
			Loader 3.1 cum capacity	hour	10.848	
			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	

Sr No	Ref.to M.		Description	Unit	Quantity	Rate (Rs.)
			b) Labour			
			Mate	day	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 240 cum/hour	hour	5.000	
			Generator 250 KVA	hour	5.000	
			Loader 3.1 cum capacity	hour	21.696	
			Transit truck agitator			
			For loading & Unloading time	hour	5.000	
			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 - Fly ash)**			
			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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 240 cum/hour	hour	5.000	
			Generator 250 KVA	hour	5.000	
			Loader 3.1 cum capacity	hour	20.973	
			Transit truck agitator			
			For loading & Unloading time	hour	5.000	
			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 Fly ash.

Sr No	Ref.to M.		Description	Unit	Quantity	Rate (Rs.)
			Balance sand = 648 x 0.9 = 583.2 tonnes = 583.02 / 1.6 = 364.5 cum. Quantity of Fly ash = (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)			
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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 120 cum/hour	hour	10.000	
			Generator 250 KVA	hour	10.000	
			Loader 3.1 cum capacity	hour	21.696	
			Transit truck agitator			
			For loading & Unloading time	hour	10.000	
			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 - Fly ash)** **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	0.160	
			Skilled Mazdoor	day	1.000	
			Mazdoor	day	3.000	
			c) Machinery			
			Batching Plant of capacity 120 cum/hour	hour	10.000	
			Generator 250 KVA	hour	10.000	

Sr No	Ref.to M.	Description	Unit	Quantity	Rate (Rs.)
		Loader 3.1 cum capacity	hour	20.973	
		Transit truck agitator			
		For loading & Unloading time	hour	10.000	
		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 Fly ash.
Balance sand = 648 x 0.9 = 583.2 tonnes = 583.02 / 1.6 = 364.5 cum.
Quantity of Fly ash = (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)

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	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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.)
21.21	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	
		b) Labour			
		Mate	day	0.160	
		Skilled Mazdoor	day	1.000	
		Mazdoor	day	3.000	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.000	
		Generator 250 KVA	hour	4.000	
		Loader 3.1 cum capacity	hour	8.679	
		Transit truck agitator			
		For loading & Unloading time	hour	4.000	
		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	0.005	
		Mazdoor	day	0.133	
		b) Machinery			
		Centrifugal water pump (600 LMP)	hour	0.533	
		Water tanker 12 KL	hour	0.533	
		Cost for 12 KL = a+b			
		Rate per KL = (a+b)/12			



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