

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

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

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

BASIC INPUT PARAMETER

Overhead and Contractor Profit

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

Lead Details

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

Note: All lead in km (one way).

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PART –A

ROAD WORKS

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

12.08	H	RCC Grade M35					
		RCC Grade M35 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.11)	cum	30.000	30.000	30.000	
		Water for curing	kL	15.750	15.750	15.750	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
d)		Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
e)		Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)		Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II		RCC Grade M35 using batching plant transit mixer & manual placing					
		Unit = cum					
		Taking output = 15 cum					
a)		Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.11)	cum	15.000	15.000	15.000	
		Water for curing	kL	7.875	7.875	7.875	
b)		Labour					
		For pouring and placing					
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
c)		Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
d)		Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					

CHAPTER: 12- FOUNDATIONS

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					
		RCC Grade M40 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.12)	cum	30.000	30.000	30.000	
		Water for curing	kL	15.750	15.750	15.750	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656	0.219 x L1 + 0.656	0.219 x L1 + 0.656	
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	0.292 x L1 + 0.875	
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ 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					

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Case II RCC Grade M40 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	15.000	15.000	15.000	
		Water for curing	kL	7.875	7.875	7.875	
		b) Labour					
		For pouring and placing					
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.08	J	Case I RCC Grade M45 RCC Grade M45 using batching plant transit mixer & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-	cum	30.000	30.000	30.000	

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		analysis 21.13)					
		Water for curing	Kl	15.750	15.750	15.750	
b)	Labour						
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		5050.000	5060.000	5093.000	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

Case II RCC Grade M45 using batching plant transit mixer & manual placing

Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis 21.13)

Water for curing Kl 7.875 7.875 7.875

b) Labour

For pouring and placing

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.440	0.440	0.440	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	9.000	9.000	9.000	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = $(a+b+c+d+e+f)/15$

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 = No

Taking output = 1 No.

a) Material

Earth (compacted)	cum	565.487	565.487	565.487
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Sand bags	each	1125.000	1125.000	1125.000
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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
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c) Machinery

Crane with grab 1 cum capacity	hour	30.000	30.000	30.000
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CHAPTER: 12- FOUNDATIONS

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

Consumables @ 2.5
Percent of (c) above
d) Overhead charges @ on (a+b+c)
e) Contractor's profit @ on (a+b+c+d)
Rate per No. (a+b+c+d+e)

Note It is assumed that earth will be available within the working space of crane with grab bucket.

12.09	B	Assuming depth of water 4.0 m and height of island 4.5 m.					
		Unit = No					
		Taking output = 1 No					
	a) Material						
	Earth (compacted)	cum	1356.000	1356.000	1356.000		
	Sand bags	each	9000.000	9000.000	9000.000		
	Wooden ballies 8" Dia 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)	@ 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 No. (a+b+c+d+e)						

Note For other well diameters rate can be worked out on the basis of cross-sectional area of well. The diameter of the island shall be in the conformity with clause 1203.4 of MoRTH specifications.

12.09	C	Providing and constructing one span service road to reach island location from one pier location to another pier location					
		Assuming span length 30 m, width of service road 10 m and depth of water 1 m					

CHAPTER: 12- FOUNDATIONS

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

Unit = meter

Taking output = 30 metre

a) Material

Earth	cum	450.000	450.000	450.000
Sand bags	each	300.000	300.000	300.000

b) Labour

Mate	day	0.240	0.240	0.240
Mazdoor for filling sand bags, stitching and placing	day	6.000	6.000	6.000

c) Machinery

Front end Loader 1 cum capacity	hour	27.000	27.000	27.000
Tipper 5.5 cum capacity	hour	28.000	28.000	28.000

d) Overhead charges

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

e) Contractor's profit

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

Cost for 30 m (a+b+c+d+e)

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

12.10 1200 & 1900

Providing and Laying Cutting Edge of Mild Steel weighing 40 kg per metre for Well Foundation complete as per Drawing and Technical Specification.

Unit = MT

Taking output = 1.0 MT

a) Material

Structural steel in plates, angles, etc including 5 Percent wastage	tonne	1.050	1.050	1.050
Nuts & bolts	Kg	20.000	20.000	20.000

b) Machinery

Hydra Crane of capacity 10T for lifting shifting	hour	8.000	8.000	8.000
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Tipper for Transportation to site

(i) 18 cum capacity	t.km	1.05 x L1		
(ii) 14 cum capacity	t.km		1.05 x L1	
(iii) 10 cum capacity	t.km			1.05 x L1

c) Labour

(for cutting, bending, making holes, joining, welding and erecting in position)

Mate	day	1.436	1.436	1.436
Fitter	day	5.985	5.985	5.985
Blacksmith	day	5.985	5.985	5.985
Welder	day	5.985	5.985	5.985

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	17.955	17.955	17.955	
		Electrodes, cutting gas and other consumables @ 10 Percent of cost of (a) above					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per MT (a+b+c+d+e)					
12.11	1200, 1500 & 1700	Plain/Reinforced Cement Concrete, in Well Foundation complete as per Drawing and Technical Specification.					
	A	Well curb					
	(i)	RCC M20 Grade					
12.11 A	Case I	RCC Grade M20 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
	a)	Material					
		Per Cum Basic Cost	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis 21.06)					
	b)	Labour					
		For pouring and placing					
		Mate	day	0.166	0.166	0.166	
		Mason	day	1.000	1.000	1.000	
		Mazdoor	day	3.143	3.143	3.143	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
	d)	Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 A	Case II (i)	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	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 A	Case I (ii)	(ii) RCC M25 Grade 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	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	

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

- d) **Formwork @ 20 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery
- e) **Overhead charges** @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
- f) **Contractor's profit** @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 30 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/30

12.11 A Case II (ii)
RCC Grade M25 using batching plant & manual placing
Unit = cum

Taking output = 15 cum

a) Material	Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	15.000	15.000	15.000
b) Labour					
For pouring and placing					
Mate	day	0.479	0.479	0.479	
Mason	day	1.330	1.330	1.330	
Mazdoor	day	10.640	10.640	10.640	
c) Machinery					
Transit truck agitator					
For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
For unloading	hour	0.833	0.833	0.833	
d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
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)/15

12.11 A Case I (iii)
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
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Labour						
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
d)	Formwork @ 20 Percent	on cost of concrete i.e.					
		cost of material, labour					
		and machinery					
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

12.11 A (iii)	Case II	RCC Grade M30 using batching plant & manual placing Unit = cum Taking output = 15 cum	a)	Material	Per Cum Basic Cost (Rate taken from sub- analysis 21.09)	cum	15.000	15.000	15.000
b)	Labour								
		For pouring and placing							
		Mate	day	0.479	0.479	0.479			
		Mason	day	1.330	1.330	1.330			
		Mazdoor	day	10.640	10.640	10.640			
c)	Machinery								
		Transit truck agitator							
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1			
		For unloading	hour	0.833	0.833	0.833			
d)	Formwork @ 20 Percent	on cost of concrete i.e.							
		cost of material, labour							
		and machinery							
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)			
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)			
		Cost for 15 cum = a+b+c+d+e+f							
		Rate per cum = (a+b+c+d+e+f)/15							

Note If curb concrete is carried out within steel liner, cost of formwork shall be excluded.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 A 12.11 A (iv)	(iv) Case I	RCC M35 Grade 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 Mason Mazdoor	day	0.179	0.179	0.179	
			day	1.330	1.330	1.330	
			day	3.143	3.143	3.143	
		c) Machinery Transit truck agitator For transportation (6 cum Capacity) For unloading	tonne-km	75 x L1	75 x L1	75 x L1	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery	hour	0.726	0.726	0.726	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		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 Mason Mazdoor	day	0.479	0.479	0.479	
			day	1.330	1.330	1.330	
			day	10.640	10.640	10.640	
		c) Machinery Transit truck agitator For transportation (6 cum Capacity) For unloading	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
			hour	0.833	0.833	0.833	

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

- d) **Formwork** @ 20 Percent
on cost of concrete i.e.
cost of material, labour
and machinery
- e) **Overhead charges** @ on
(a+b+c+d) @ on
(a+b+c+d) @ on
(a+b+c+d)
- f) **Contractor's profit** @ on
(a+b+c+d+e) @ on
(a+b+c+d+e) @ on
(a+b+c+d+e)
- Cost for 15 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/15

Note If curb concrete is carried out within steel liner, cost of formwork shall be excluded.

12.11 A	(v)	RCC M40 Grade					
12.11 A	Case I	RCC Grade M40 using batching plant & Concrete pump					
	(v)	Unit = cum					
		Taking output = 30 cum					
a)	Material	Per Cum Basic Cost (Rate taken from sub- analysis 21.12)	cum	30.000	30.000	30.000	
b)	Labour	For pouring and placing					
	Mate	day	0.179	0.179	0.179	0.179	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	3.143	3.143	3.143	3.143	
c)	Machinery	Transit truck agitator					
	For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	75 x L1	
	For unloading	hour	0.726	0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726	0.726	
d)	Formwork	@ 20 Percent on cost of concrete i.e. cost of material, labour and machinery					
e)	Overhead charges	@ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)					
f)	Contractor's profit	@ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)					
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					

12.11 A	Case II	RCC Grade M40 using batching plant & manual placing					
(v)		Unit = cum					
		Taking output = 15 cum					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Material						
	Per Cum Basic Cost (Rate taken from sub-analysis 21.12)	cum	15.000	15.000	15.000	15.000	
b)	Labour						
	For pouring and placing						
	Mate	day	0.479	0.479	0.479	0.479	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	10.640	10.640	10.640	10.640	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	37.5 x L1	
	For unloading	hour	0.833	0.833	0.833	0.833	
d)	Formwork @ 20 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
	Cost for 15 cum = a+b+c+d+e+f						
	Rate per cum = (a+b+c+d+e+f)/15						

Note If curb concrete is carried out within steel liner, cost of formwork shall be excluded.

12.11	B	Well steining				
	(i)	PCC M15 Grade				
12.11 B	Case I	PCC Grade M15 using batching plant & Concrete pump				
	(i)	Unit = cum				
		Taking output = 30 cum				
a)	Material					
	Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	30.000	30.000	30.000	
b)	Labour					
	For pouring and placing					
	Mate	day	0.126	0.126	0.126	
	Mason	day	1.330	1.330	1.330	
	Mazdoor	day	1.813	1.813	1.813	
c)	Machinery					
	Transit truck agitator					
	For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
	For unloading	hour	0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726	

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

- d) **Formwork @ 10 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery
- e) **Overhead charges** @ on (a+b+c+d)
- f) **Contractor's profit** @ on (a+b+c+d+e)
- Cost for 30 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/30

12.11 B Case II (i)
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
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b) Labour

For pouring and placing

Mate	day	0.479	0.479	0.479
Mason	day	1.330	1.330	1.330
Mazdoor	day	10.640	10.640	10.640

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833

- d) **Formwork @ 10 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery

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

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)/15

12.11 B Case I (ii)
PCC M20 Grade
PCC Grade M20 using batching plant & Concrete pump
Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	30.000	30.000	30.000
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Labour						
		For pouring and placing					
	Mate	day	0.126	0.126	0.126	0.126	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	1.813	1.813	1.813	1.813	
c)	Machinery						
		Transit truck agitator					
	For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	75 x L1	
	For unloading	hour	0.726	0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726	0.726	
d)	Formwork @ 10 Percent						
	on cost of concrete i.e.						
	cost of material, labour						
	and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
	Cost for 30 cum = a+b+c+d+e+f						
	Rate per cum = (a+b+c+d+e+f)/30						

12.11 B (ii)	Case II	PCC Grade M20 using batching plant & manual placing Unit = cum	Taking output = 15 cum	a)	Material		
					Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	15.000
				b)	Labour		
					For pouring and placing		
					Mate	day	0.479
					Mason	day	1.330
					Mazdoor	day	10.640
				c)	Machinery		
					Transit truck agitator		
					For transportation (6 cum Capacity)	t. km	37.5 x L1
					For unloading	hour	0.833
				d)	Formwork @ 10 Percent		
					on cost of concrete i.e.		
					cost of material, labour		
					and machinery		
				e)	Overhead charges		
					@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
				f)	Contractor's profit		
					@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)
					Cost for 15 cum = a+b+c+d+e+f		
					Rate per cum = (a+b+c+d+e+f)/15		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 B 12.11 B (iii)	(iii) Case I	RCC M20 Grade 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	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B (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	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	

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

- d) **Formwork @ 10 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery
- e) **Overhead charges** @ on (a+b+c+d)
- 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)/15

12.11 B	(iv)	PCC M25 Grade					
12.11 B	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	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	t. km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges	@ on (a+b+c+d)				
		f) Contractor's profit	@ on (a+b+c+d+e)				
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					

12.11 B	Case II	PCC Grade M25 using batching plant & manual placing
		Unit = cum
		Taking output = 15 cum

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Material						
	Per Cum Basic Cost (Rate taken from sub-analysis 21.06)		cum	15.000	15.000	15.000	
b)	Labour						
	For pouring and placing						
	Mate	day	0.479	0.479	0.479	0.479	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	10.640	10.640	10.640	10.640	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	37.5 x L1	
	For unloading	hour	0.833	0.833	0.833	0.833	
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges	@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)	
f)	Contractor's profit	@ on (a+b+c+d+e)		@ on (a+b+c+d+e)		@ on (a+b+c+d+e)	
	Cost for 15 cum = a+b+c+d+e+f						
	Rate per cum = (a+b+c+d+e+f)/15						

12.11 B	(v)	RCC M25 Grade					
12.11 B	Case I	RCC Grade M25 using batching plant & Concrete pump					
(v)		Unit = cum					
		Taking output = 30 cum					
a)	Material						
	Per Cum Basic Cost (Rate taken from sub-analysis 21.07)	cum	30.000	30.000	30.000	30.000	
b)	Labour						
	For pouring and placing						
	Mate	day	0.179	0.179	0.179	0.179	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	3.143	3.143	3.143	3.143	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	75 x L1	
	For unloading	hour	0.726	0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726	0.726	
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B (v)	Case II	RCC Grade M25 using batching plant & manual placing Unit = cum Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.07)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 B (vi)	Case I	PCC M30 Grade					
12.11 B (vi)	Case I	PCC Grade M30 using batching plant & Concrete pump Unit = cum Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.08)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km		75 x L1	75 x L1	75 x L1	
	For unloading	hour		0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour		0.726	0.726	0.726	
d)	Formwork @ 10 Percent						
	on cost of concrete i.e.						
	cost of material, labour						
	and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

12.11 B (vi)	Case II	PCC Grade M30 using batching plant & manual placing Unit = cum Taking output = 15 cum					
a)	Material						
	Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum		15.000	15.000	15.000	
b)	Labour						
	For pouring and placing						
	Mate	day		0.479	0.479	0.479	
	Mason	day		1.330	1.330	1.330	
	Mazdoor	day		10.640	10.640	10.640	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km		37.5 x L1	37.5 x L1	37.5 x L1	
	For unloading	hour		0.833	0.833	0.833	
d)	Formwork @ 10 Percent						
	on cost of concrete i.e.						
	cost of material, labour						
	and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 B	(vii)	RCC M30 Grade					
12.11 B	Case I	RCC Grade M30 using batching plant & Concrete pump					
(vii)		Unit = cum					
		Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.09)	cum	30.000	30.000	30.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 B	Case II	RCC Grade M30 using batching plant & manual placing					
(vii)		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.09)	cum	15.000	15.000	15.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/15					
12.11 B 12.11 B (viii)	(viii) Case I	RCC M35 Grade 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	0.179	0.179	0.179	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					
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	

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

b)	Labour						
For pouring and placing							
	Mate	day	0.479	0.479	0.479		
	Mason	day	1.330	1.330	1.330		
	Mazdoor	day	10.640	10.640	10.640		
c)	Machinery						
Transit truck agitator							
	For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1		
	For unloading	hour	0.833	0.833	0.833		
d)	Formwork @ 10 Percent						
	on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
Cost for 15 cum = a+b+c+d+e+f							
Rate per cum = (a+b+c+d+e+f)/15							

12.11 B	(ix)	RCC M40 Grade					
12.11 B	Case I	RCC Grade M40 using batching plant & Concrete pump					
Unit = cum							
Taking output = 30 cum							
a) Material							
		Per Cum Basic Cost (Rate taken from sub- analysis 21.12)	cum	30.000	30.000	30.000	
b)	Labour						
For pouring and placing							
	Mate	day	0.179	0.179	0.179		
	Mason	day	1.330	1.330	1.330		
	Mazdoor	day	3.143	3.143	3.143		
c)	Machinery						
Transit truck agitator							
	For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1		
	For unloading	hour	0.726	0.726	0.726		
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726		
d)	Formwork @ 10 Percent						
	on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
Cost for 30 cum = a+b+c+d+e+f							
Rate per cum = (a+b+c+d+e+f)/30							

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 B	Case II	RCC Grade M40 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost	cum	15.000	15.000	15.000	
		(Rate taken from sub-analysis 21.12)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.833	0.833	0.833	
		d) Formwork @ 10 Percent					
		on cost of concrete i.e.					
		cost of material, labour					
		and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					
12.11 C	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	cum	30.000	30.000	30.000	
		(Rate taken from sub-analysis 21.04)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne-km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	0.726
		Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	0.726
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/30					
Case II		PCC Grade M20 using batching plant & manual placing					
		Unit = cum					
		Taking output = 15 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.04)	cum	15.000	15.000	15.000	15.000
	b)	Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	0.479
		Mason	day	1.330	1.330	1.330	1.330
		Mazdoor	day	10.640	10.640	10.640	10.640
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	37.5 x L1
		For unloading	hour	0.833	0.833	0.833	0.833
		Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833	0.833
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 C	(ii)	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	cum	30.000	30.000	30.000	
		(Rate taken from sub- analysis 21.06)					
	b)	Labour					
		For pouring and placing					
		Mate	day	0.126	0.126	0.126	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	1.813	1.813	1.813	
	c)	Machinery					
		Transit truck agitator					
		For transportation	tonne- km	75 x L1	75 x L1	75 x L1	
		(6 cum Capacity)					
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	
		Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 30 cum = a+b+c+d+					
		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	cum	15.000	15.000	15.000	
		(Rate taken from sub- analysis 21.06)					
	b)	Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	

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

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1
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For unloading	hour	0.833	0.833	0.833
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Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833
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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+

Rate per cum = (a+b+c+d+e)/15

12.11 C

(iii)

Case I

PCC Grade M30

**PCC Grade M30 using
batching plant & Concrete
pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis 21.08)	cum	30.000	30.000	30.000
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b) Labour

For pouring and placing

Mate	day	0.126	0.126	0.126
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Mason	day	1.330	1.330	1.330
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Mazdoor	day	1.813	1.813	1.813
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c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
--	--------------	---------	---------	---------

For unloading	hour	0.726	0.726	0.726
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Hydraulic Boom placer pump	hour	0.726	0.726	0.726
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Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726
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Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.

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

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

Cost for 30 cum = a+b+c+d+e

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

**Case II PCC Grade M30 using
batching plant & manual
placing**
Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis 21.08)	cum	15.000	15.000	15.000
--	-----	--------	--------	--------

b) Labour

For pouring and placing

Mate	day	0.479	0.479	0.479
Mason	day	1.330	1.330	1.330
Mazdoor	day	10.640	10.640	10.640

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833
Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833

Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.

d) Overhead charges

e) Contractor's profit

@ on (a+b+c)

@ 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
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Labour						
		For pouring and placing					
	Mate	day	0.126	0.126	0.126	0.126	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	1.813	1.813	1.813	1.813	
c)	Machinery						
		Transit truck agitator					
	For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	75 x L1	
	For unloading	hour	0.726	0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726	0.726	
	Hydra Crane for holding tremie pipe	hour	0.726	0.726	0.726	0.726	
	Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.						
d)	Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e)	Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Cost for 30 cum = a+b+c+d+e						
	Rate per cum = (a+b+c+d+e)/30						

Case II	PCC Grade M35 using batching plant & manual placing						
	Unit = cum						
	Taking output = 15 cum						
a)	Material						
	Per Cum Basic Cost (Rate taken from sub- analysis 21.10)	cum	15.000	15.000	15.000	15.000	
b)	Labour						
	For pouring and placing						
	Mate	day	0.479	0.479	0.479	0.479	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	10.640	10.640	10.640	10.640	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1	37.5 x L1	
	For unloading	hour	0.833	0.833	0.833	0.833	
	Hydra Crane for holding tremie pipe	hour	0.833	0.833	0.833	0.833	
	Add 5 Percent of cost of material and labour towards cost of forming sump, protective bunds,						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		chiselling and making arrangements for under water concreting with tremie pipe.					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 15 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/15					
12.11	D	Intermediate plug Grade M20 PCC					
	(i)	Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
12.11 D	Case I	PCC Grade M20 using batching plant & Concrete pump					
	(i)	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.11 (C) (i)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D	Case II	PCC Grade M20 using batching plant & manual placing					
	(i)	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.11 (C) (i)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D	(ii)	Grade M25 PCC					
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
12.11 D	Case I	PCC Grade M25 using batching plant & Concrete pump					
	(ii)	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Rate for concrete may be adopted vide item no. 12.11 (C) (ii)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
12.11 D	Case II (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	Case I (iii)	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	Case II (iii)	PCC Grade M30 using batching plant & manual placing					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)					
		Rate for concrete may be adopted vide item no. 12.11 (C) (iii)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11	E	Top plug (i) Grade M15 PCC Same as Item 12.8(a) excluding formwork					
12.11 E	Case I	PCC Grade M15 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (A) d) Overhead charges e) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				Rate per cum = (a+b+c+d+e)			
12.11 E	Case II	PCC Grade M15 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (A) d) Overhead charges e) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				Rate per cum = (a+b+c+d+e)			
12.11 E	(ii)	Grade M20 PCC Same as Item 12.8(b) excluding formwork					
12.11 E	Case I	PCC Grade M20 using batching plant & Concrete pump Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (B) d) Overhead charges e) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
				Rate per cum = (a+b+c+d+e)			
12.11 E	Case II	PCC Grade M20 using batching plant & manual placing Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (B)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per cum = (a+b+c+d+e)							
12.11 E	(iii)	Grade M25 PCC					
		Same as Item 12.8 (d) excluding formwork					
12.11 E	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	Case II	PCC Grade M25 using batching plant & manual placing					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (D)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per cum = (a+b+c+d+e)							
12.11 E	(iv)	Grade M30 PCC					
		Same as Item 12.8(f) excluding formwork					
12.11 E	Case I	PCC Grade M30 using batching plant & Concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) Rate for concrete may be adopted vide item no. 12.08 (F)					
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per cum = (a+b+c+d+e)							

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 E	Case II (iv)	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 (i)	Well cap					
		RCC Grade M20					
	Case I	RCC Grade M20 using batching plant transit mixer & Concrete pump					
		Unit = cum					
		Taking output = 15 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	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
Case II	RCC Grade M20 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum						
a)	Material						
	Per Cum Basic Cost (Rate taken from sub- analysis 21.06)	cum	15.000	15.000	15.000		
	Water for curing	kl	7.875	7.875	7.875		
b)	Labour						
	For pouring and placing						
	Mate	day	0.505	0.505	0.505		
	Mason	day	1.995	1.995	1.995		
	Mazdoor	day	10.640	10.640	10.640		
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1		
	For unloading	hour	0.833	0.833	0.833		
	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)						
	(i) 16 KL capacity	hour	0.109 x L1 + 0.328	0.109 x L1 + 0.328	0.109 x L1 + 0.328		
	(ii) 12 KL capacity	hour		0.146 x L1 + 0.438	0.146 x L1 + 0.438		
	(iii) 6 KL capacity	hour			0.292 x L1 + 0.875		
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
	Cost for 15 cum = a+b+c+d+e+f						
	Rate per cum = (a+b+c+d+e+f)/15						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 F	(ii)	RCC Grade M25					
12.11 F	Case I	RCC Grade M25 using batching plant transit mixer & Concrete pump Unit = cum					
	(ii)	Taking output = 30 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.07)	cum	30.000	30.000	30.000	
		Water for curing	kL	15.750	15.750	15.750	
		b) Labour					
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F	Case II	RCC Grade M25 using batching plant transit mixer & manual placing Unit = cum					
	(iii)	Taking output = 15 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.07)	cum	15.000	15.000	15.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	7.875	7.875	7.875	
b)	Labour						
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

12.11 F	(iii)	RCC Grade M30					
12.11 F	Case I	RCC Grade M30 using batching plant transit mixer & Concrete pump Unit = cum					
		Taking output = 30 cum					
a)	Material						
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
b)	Labour						
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
c)	Machinery						
		Transit truck agitator					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F (iii)	Case II	RCC Grade M30 using batching plant transit mixer & manual placing Unit = cum Taking output = 15 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	15.000	15.000	15.000	
		Water for curing	Kl	7.875	7.875	7.875	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

12.11 F	(iv)	RCC Grade M35					
12.11 F	Case I	RCC Grade M35 using batching plant transit mixer & Concrete pump Unit = cum					
		Taking output = 30 cum					
a)	Material						
	Per Cum Basic Cost (Rate taken from sub- analysis 21.11)	cum	30.000	30.000	30.000		
	Water for curing	kL	15.750	15.750	15.750		
b)	Labour						
	For pouring and placing						
	Mate	day	0.206	0.206	0.206		
	Mason	day	1.995	1.995	1.995		
	Mazdoor	day	3.143	3.143	3.143		
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1		
	For unloading	hour	0.726	0.726	0.726		
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726		
	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)						
	(i) 16 KL capacity	hour	0.219 x L1 + 0.656				
	(ii) 12 KL capacity	hour		0.292 x L1 + 0.875			
	(iii) 6 KL capacity	hour			0.583 x L1 + 1.75		
d)	Formwork @ 4 Percent on cost of concrete i.e.						

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

	cost of material, labour and machinery						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		

Cost for 30 cum = a+b+c+d+e+f

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

12.11 F	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	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour	0.146 x L1 + 0.438			
		(iii) 6 KL capacity	hour	0.292 x L1 + 0.875			
		d) Formwork @ 4 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.11 F (v)	Case I	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	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					
12.11 F (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 (Rate taken from sub- analysis 21.12)	cum	15.000	15.000	15.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	7.875	7.875	7.875	
b)	Labour						
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

12.11 F	(vi)	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	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)				
				Large	Medium	Small					
c) Machinery											
Transit truck agitator											
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1					
		For unloading	hour	0.726	0.726	0.726					
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)									
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656							
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875						
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75					
d) Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery											
e) Overhead charges											
@ on (a+b+c+d)											
f) Contractor's profit											
@ on (a+b+c+d+e)											
Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30											

12.11 F	Case II	RCC Grade M45 using batching plant transit mixer & manual placing
	(vi)	Unit = cum
		Taking output = 15 cum
		a) Material
		Per Cum Basic Cost (Rate taken from sub-analysis 21.13)
		Water for curing
		b) Labour
		For pouring and placing
		Mate
		Mason
		Mazdoor
		c) Machinery
		Transit truck agitator
		For transportation (6 cum Capacity)
		For unloading
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/15					

12.12 Section 1200 Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.

Unit = Running Meter

Taking output = 1 m

Diameter of well - 6 m.

A Sandy Soil

(i) Depth below bed level upto 3.0 M

Rate of sinking = 0.50 m per hour.

a) Labour

Mate	day	0.160	0.160	0.160
Sinker (skilled)	day	1.330	1.330	1.330
Sinking helper (semi-skilled)	day	2.660	2.660	2.660

b) Machinery

Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	2.000	2.000	2.000
Consumables in sinking @10 Percent of (b)				

c) Overhead charges

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

d) Contractor's profit

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

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

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.12 A	(ii)	Beyond 3m upto 10m depth Rate of sinking = 0.33 m per hour.					
	a)	Labour					
		Mate	day	0.200	0.200	0.200	
		Sinker	day	1.663	1.663	1.663	
		Sinking helper (semi-skilled)	day	3.325	3.325	3.325	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.000	3.000	3.000	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.12 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.12 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.12	B	Clayey Soil (6m dia. Well) Unit = Running Meter. Taking output = 1 meter					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.33 m per hour.					
	a)	Labour					
		Mate	day	0.200	0.200	0.200	
		Sinker (skilled)	day	1.995	1.995	1.995	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.000	3.000	3.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
	a)	Labour					
		Mate	day	0.399	0.399	0.399	
		Sinker	day	3.990	3.990	3.990	
		Sinking helper (semi-skilled)	day	5.985	5.985	5.985	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	2.000	2.000	2.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.12 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering of the cost, if required					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.12 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour)					
12.12	c	Extra over item no. 12.12 (A) or (B) irrespective of depth for sinking in Soft Rock (6m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					
	a)	Labour					
		Mate	day	0.652	0.645	0.645	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.500	0.500	
		Mazdoor	day	10.640	10.640	10.640	
	b)	Machinery					
		Air Compressor 250 cfm	hour	28.274	28.274	28.274	
		Pneumatic breaker	hour	56.549	56.549	56.549	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.12	D	Extra over item no. 12.12 (A) or (B) irrespective of depth for sinking in Hard Rock (6m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a) Material							
		Small dia.Explosive at 0.20 kg / cum	kg	5.655	5.655	5.655	
		Electric detonators	no	25.000	25.000	25.000	
		Detonating fuse coil	m	78.000	78.000	78.000	
b) Labour							
		Mate	day	0.665	0.665	0.665	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	7.980	7.980	7.980	
c) Machinery							
		Air Compressor 250 cfm	hour	26.590	26.590	26.590	
		Pneumatic breaker	hour	22.619	22.619	22.619	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	14.561	14.561	14.561	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
d) Overhead charges							
e) Contractor's profit							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
					@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
Rate per metre = (a+b+c+d+e)							

12.12 E Extra over item no. 12.12 (A) or (B) irrespective of depth for sinking in rock bouldery strata (6m dia well)

Unit = Running Meter.

Taking output = 1 m

a) Labour

Mate	day	0.545	0.545	0.545
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Mazdoor	day	7.980	7.980	7.980

b) Machinery

Air Compressor 250 cfm	hour	47.124	47.124	47.124
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic breaker	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	A Sandy Soil						
(i)	Depth below bed level upto 3.0 M						
		Rate of sinking = 0.30 m per hour.					
a)	Labour						
	Mate	day	0.200	0.200	0.200	0.200	
	Sinker (skilled)	day	1.663	1.663	1.663	1.663	
	Sinking helper (semi-skilled)	day	3.325	3.325	3.325	3.325	
b)	Machinery						
	Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	3.250	3.250	3.250	3.250	
	Consumables in sinking @10 Percent of (b)						
c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)		
d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
	Rate per metre = (a+b+c+d)						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.13 A	(ii)	Beyond 3m upto 10m depth Rate of sinking = 0.22 m per hour.					
	a)	Labour					
		Mate	day	0.239	0.239	0.239	
		Sinker	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	3.990	3.990	3.990	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.500	4.500	4.500	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.13 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.13 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.13	B	Clayey Soil (7m dia. Well) Unit = Running Meter. Taking output = 1 cum					
	(I)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.22 m per hour.					
	a)	Labour					
		Mate	day	0.239	0.239	0.239	
		Sinker (skilled)	day	1.995	1.995	1.995	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	3.990	3.990	3.990	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.500	4.500	4.500	
		Consumables in sinking @ 10 Percent of (b)					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d)					
12.13 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
	a)	Labour					
		Mate	day	0.319	0.319	0.319	
		Sinker	day	2.660	2.660	2.660	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.250	3.250	3.250	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.13 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.13 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.13	C	Extra over item no. 12.13 (A) or (B) irrespective of depth for sinking in Soft Rock (7m dia well) Unit = Running Meter. Taking output = 1 m					
	a)	Labour					
		Mate day	0.758	0.758	0.758		
		Sinker (skilled) day	1.995	1.995	1.995		
		Sinking helper (semi-skilled) day	2.993	2.993	2.993		
		Diver day	0.665	0.665	0.665		
		Mazdoor day	13.300	13.300	13.300		
	b)	Machinery					
		Air Compressor 250 cfm hour	38.485	38.485	38.485		
		Pneumatic breaker hour	76.969	76.969	76.969		
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.13	D	Extra over item no. 12.13 (A) or (B) irrespective of depth for sinking in Hard Rock (7m dia well) Unit = Running Meter Taking output = 1 m					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a) Material							
		Small dia.Explosive at 0.20 kg / cum	kg	7.697	7.697	7.697	
		Electric detonators	no	36.000	36.000	36.000	
		Detonating fuse coil	m	112.000	112.000	112.000	
b) Labour							
		Mate	day	0.771	0.771	0.771	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	10.640	10.640	10.640	
c) Machinery							
		Air Compressor 250 cfm	hour	33.304	33.304	33.304	
		Pneumatic breaker	hour	30.788	30.788	30.788	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	19.820	19.820	19.820	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
d) Overhead charges							
e) Contractor's profit							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per metre = (a+b+c+d+e)							

12.13 E Extra over item no. 12.13 (A) or (B) irrespective of depth for sinking in rock bouldery strata (7m dia well)

Unit = Running Meter.

Taking output = 1 m

a) Labour

Mate	day	0.652	0.652	0.652
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Mazdoor	day	10.640	10.640	10.640

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Air Compressor 250 cfm	hour	64.141	64.141	64.141	
		Pneumatic breaker	hour	128.282	128.282	128.282	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

12.14 Section 1200 Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.

Unit = Running Meter.

Taking output = 1 m

Diameter of well - 8 m.

A Sandy Soil

(i) Depth below bed level upto 3.0 M

Rate of sinking @ 0.25 m/hour

a) Labour

Mate	day	0.239	0.239	0.239
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	3.990	3.990	3.990

b) Machinery

Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.000	4.000	4.000
Consumables in sinking @10 Percent of (b)				

c) Overhead charges

d) Contractor's profit

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

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.14 A	(ii)	Beyond 3m upto 10m depth Rate of sinking @ 0.20 m/hour					
	a)	Labour Mate day 0.279 0.279 0.279 Sinker day 2.328 2.328 2.328 Sinking helper (semi-skilled) day 4.655 4.655 4.655					
	b)	Machinery Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. 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 0.293 0.293 0.293 Sinker (skilled) day 2.660 2.660 2.660 Sinking helper (semi-skilled) hour 4.655 4.655 4.655					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. Consumables in sinking @ 10 Percent of (b)		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)					
12.14 B	(ii) Beyond 3m upto 10m depth	Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Sinker	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	5.985	5.985	5.985	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.500	3.500	3.500	
		Consumables in sinking @ 10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14 B	(iii) Beyond 10 m upto 20 m						
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.14 B	(iv) Beyond 20m upto 30 m						
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.14 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.14	C	Extra over item no. 12.14 (A) or (B) irrespective of depth for sinking in Soft Rock (8 m dia well) Unit = Running Meter. Taking output = 1 m					
	a)	Labour					
		Mate	day	0.865	0.865	0.865	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	15.960	15.960	15.960	
	b)	Machinery					
		Air Compressor 250 cfm	hour	50.265	50.265	50.265	
		Pneumatic breaker	hour	100.531	100.531	100.531	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.14	D	Extra over item no. 12.14 (A) or (B) irrespective of depth for sinking in Hard Rock (8 m dia well) Unit = Running Meter Taking output = 1 m					
	a)	Material					
		Small dia.Explosive at 0.20 kg / cum	kg	10.053	10.053	10.053	
		Electric detonators	no	50.000	50.000	50.000	
		Detonating fuse coil	m	155.000	155.000	155.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b) Labour							
		Mate	day	0.878	0.878	0.878	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	13.300	13.300	13.300	
c) Machinery							
		Air Compressor 250 cfm	hour	41.050	41.050	41.050	
		Pneumatic breaker	hour	40.212	40.212	40.212	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	25.887	25.887	25.887	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
d) Overhead charges							
e) Contractor's profit							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per metre = (a+b+c+d+e)							

12.14

E Extra over item no. 12.14 (A) & (B) irrespective of depth for sinking in rock bouldery strata (8 m dia well)

Unit = Running Meter.

Taking output = 1 m

a) Labour

Mate	day	0.758	0.758	0.758
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Mazdoor	day	13.300	13.300	13.300

b) Machinery

Air Compressor 250 cfm	hour	83.776	83.776	83.776
Pneumatic breaker	hour	167.552	167.552	167.552

Consumables in sinking @ 5 Percent of (b)

Add for dewatering @ of 15 Percent of (a+b), if required

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15	Section 1200	Sinking of 9 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level. Unit = Running Meter. Taking output = 1 m Diameter of well - 9 m.					
A		Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
	a)	Labour					
		Mate	day	0.253	0.253	0.253	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	4.323	4.323	4.323	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.000	4.000	4.000	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.18 m/hour					
	a)	Labour					
		Mate	day	0.306	0.306	0.306	
		Sinker	day	2.328	2.328	2.328	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories. Consumables in sinking @10 Percent of (b)	hour	5.500	5.500	5.500	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.15 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.15 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.15	B	Clayey Soil (9m dia. Well) Unit = Running Meter. Taking output = 1 cum					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.17 m / hour					
	a)	Labour					
		Mate	day	0.319	0.319	0.319	
		Sinker (skilled)	day	2.993	2.993	2.993	
		Sinking helper (semi-skilled)	day	4.988	4.988	4.988	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.750	5.750	5.750	
		Consumables in sinking					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
				@ 10 Percent of (b)			
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.15 m / hour					
	a)	Labour					
		Mate	day	0.399	0.399	0.399	
		Sinker	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	6.650	6.650	6.650	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.500	6.500	6.500	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.750	3.750	3.750	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.15 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.15 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b Add 5 Percent of cost for dewatering, if required					
		c Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.15	C	Extra over item no. 12.15 (A) or (B) irrespective of depth for sinking in Soft Rock (9 m dia well) Unit = Running Meter. Taking output = 1 m					
		a) Labour					
		Mate	day	0.971	0.971	0.971	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	18.620	18.620	18.620	
		b) Machinery					
		Air Compressor 250 cfm	hour	63.617	63.617	63.617	
		Pneumatic breaker	hour	127.235	127.235	127.235	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.15	D	Extra over item no. 12.15 (A) or (B) irrespective of depth for sinking in Hard Rock (9 m dia well) Unit = Running Meter Taking output = 1 m					
		a) Material					
		Small dia.Explosive at 0.20 kg / cum	kg	12.723	12.723	12.723	
		Electric detonators	no	65.000	65.000	65.000	
		Detonating fuse coil	m	202.000	202.000	202.000	
		b) Labour					
		Mate	day	0.984	0.984	0.984	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	15.960	15.960	15.960	
c)	Machinery						
		Air Compressor 250 cfm	hour	49.828	49.828	49.828	
		Pneumatic breaker	hour	50.894	50.894	50.894	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	32.763	32.763	32.763	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
d)	Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e)	Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per metre = (a+b+c+d+e)							

12.15 E Extra over item no. 12.15 (A) or (B) irrespective of depth for sinking in rock bouldery strata (9 m dia well)

Unit = Running Meter.

Taking output = 1 m

a)	Labour						
	Mate	day	0.865	0.865	0.865		
	Sinker (skilled)	day	1.995	1.995	1.995		
	Sinking helper (semi-skilled)	day	2.993	2.993	2.993		
	Diver	day	0.665	0.665	0.665		
	Mazdoor	day	15.960	15.960	15.960		
b)	Machinery						
	Air Compressor 250 cfm	hour	106.029	106.029	106.029		
	Pneumatic breaker	hour	212.058	212.058	212.058		
	Consumables in sinking @ 5 Percent of (b)						
	Add for dewatering @ of 15 Percent of (a+b), if required						
	Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges d) Contractor's profit Rate per metre = (a+b+c+d)		@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
12.16	1200	Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter					
		Taking output = 1 m					
		Diameter of well - 10 m.					
A		Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.20 m / hour					
		a) Labour					
		Mate	day	0.266	0.266	0.266	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	4.655	4.655	4.655	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.000	5.000	5.000	
		Consumables in sinking @10 Percent of (b)					
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.16 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.17 m / hour					
		a) Labour					
		Mate	day	0.333	0.333	0.333	
		Sinker	day	2.660	2.660	2.660	
		Sinking helper (semi-skilled)	day	5.653	5.653	5.653	
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.750	5.750	5.750	
		Consumables in sinking @10 Percent of (b)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges d) Contractor's profit Rate per metre = (a+b+c+d)		@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
12.16 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.16 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.16 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.16	B	Clayey Soil (10m dia. Well)					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 cum</i>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.18m/hour.					
	a)	Labour					
		Mate	day	0.426	0.426	0.426	
		Sinker (skilled)	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	7.315	7.315	7.315	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.16 B	(ii)	Beyond 3m upto 10m depth Rate of sinking 0.15m/hour.					
	a)	Labour					
		Mate	day	0.452	0.452	0.452	
		Sinker	day	3.990	3.990	3.990	
		Sinking helper (semi-skilled)	day	7.315	7.315	7.315	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000	
		Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.000	4.000	4.000	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.16 B	(iii)	Beyond 10 m upto 20 m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.16 B	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.16 B	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					

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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	1.077	1.077	1.077	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	21.280	21.280	21.280	
	b)	Machinery					
		Air Compressor 250 cfm	hour	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	1.091	1.091	1.091	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	18.620	18.620	18.620	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Air Compressor 250 cfm	hour	59.640	59.640	59.640	59.640	
	Pneumatic breaker	hour	62.832	62.832	62.832	62.832	
	Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	40.448	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	3.000	
d)	Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)			
e)	Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)			
Rate per metre = (a+b+c+d+e)							

12.16 E Extra over item no. 12.16 (A) or (B) irrespective of depth for sinking in rock bouldery strata (10 m dia well)
Unit = Running Meter.

Taking output = 1 m

a) Labour

Mate	day	0.971	0.971	0.971
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Mazdoor	day	18.620	18.620	18.620

b) Machinery

Air Compressor 250 cfm	hour	130.900	130.900	130.900
Pneumatic breaker	hour	261.799	261.799	261.799

Consumables in sinking @ 5 Percent of (b)

Add for dewatering @ of 15 Percent of (a+b), if required

Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.

c) Overhead charges

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

d) Contractor's profit

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

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

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.17	1200	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	0.255	0.255	0.255	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	4.389	4.389	4.389	
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 0.5m = 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	0.346	0.346	0.346	
		Sinker	day	2.660	2.660	2.660	
		Sinking helper (semi-skilled)	day	5.985	5.985	5.985	
b)		Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	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)	
		Cost for 0.5m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.50					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.17 A	(iii)	Beyond 10m upto 20m	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter			
12.17 A	(iv)	Beyond 20m upto 30 m	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter			
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.17 A	(v)	Beyond 30m upto 40 m	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter			
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.17	B	Clayey Soil (11 m dia. Well) Unit = Running Meter Taking output = 0.50 meter					
	(i)	Depth from bed level upto 3.0 M Rate of sinking @ 0.10 m/hour	a) Labour	Mate	day	0.346	0.346
				Sinker (skilled)	day	3.325	3.325
				Sinking helper (semi-skilled)	day	5.320	5.320
	b) Machinery	Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.		hour	5.000	5.000	5.000
		Consumables in sinking @ 10 Percent of (b)					
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.5m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.50					
12.17 B	(ii)	Beyond 3m upto 10m depth Rate of sinking @ 0.08 m/hour	a) Labour	Mate	day	0.452	0.452
				Sinker	day	4.655	4.655
				Sinking helper (semi-skilled)	day	6.650	6.650

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

b) Machinery

Hire & running charges of hour crane with grab bucket of 0.75 cum capacity and accessories.

Air compressor with hour pneumatic chisel attachment for cutting hard clay

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

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Labour						
Mate		day	1.184	1.184	1.184		
Sinker (skilled)		day	1.995	1.995	1.995		
Sinking helper (semi-skilled)		day	2.993	2.993	2.993		
Diver		day	0.665	0.665	0.665		
Mazdoor		day	23.940	23.940	23.940		
b)	Machinery						
Air Compressor 250 cfm		hour	95.033	95.033	95.033		
Pneumatic breaker		hour	190.066	190.066	190.066		
Consumables in sinking							
@ 5 Percent of (b)							
Add for dewatering @ of							
15 Percent of (a+b), if							
required							
Additional Hire & running		hour	3.000	3.000	3.000		
charges for shifting of							
crane (rock breaking							
time) with grab bucket of							
0.75 cum capacity and							
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 metre = (a+b+c+d)							

12.17 D Extra over item no. 12.17 (A) or (B) irrespective of depth for sinking in Hard Rock (11 m dia well)

Unit = Running Meter

Taking output = 1 m

a) Material

Small dia.Explosive at 0.20 kg / cum	kg	19.007	19.007	19.007
Electric detonators	no	101.000	101.000	101.000
Detonating fuse coil	m	314.000	314.000	314.000

b) Labour

Mate	day	1.197	1.197	1.197
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Driller	day	2.660	2.660	2.660
Blaster	day	0.333	0.333	0.333
Mazdoor	day	21.280	21.280	21.280

c) Machinery

Air Compressor 250 cfm	hour	70.484	70.484	70.484
Pneumatic breaker	hour	76.027	76.027	76.027
Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	48.942	48.942	48.942

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Consumables in protected blasting @ 10 Percent of (c) Add for dewatering @ of 15 Percent of (a+b+c), if required Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.17	E	Extra over item no. 12.17 (A) or (B) irrespective of depth for sinking in rock bouldery strata (11 m dia well) Unit = Running Meter. Taking output = 1 m					
		a) Labour					
		Mate	day	1.077	1.077	1.077	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	21.280	21.280	21.280	
		b) Machinery					
		Air Compressor 250 cfm	hour	158.389	158.389	158.389	
		Pneumatic breaker	hour	316.777	316.777	316.777	
		Consumables in sinking @ 5 Percent of (b) Add for dewatering @ of 15 Percent of (a+b), if required Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.18	1200	Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against					

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

each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.

Unit = Running Meter

Taking output = 0.25 m

Diameter of well - 12 m.

A Sandy Soil

(i) I) Depth below bed level upto 3.0 M

Rate of sinking @ 0.05 m/hour

a) Labour

Mate	day	0.306	0.306	0.306
Sinker (skilled)	day	2.328	2.328	2.328
Sinking helper (semi-skilled)	day	5.320	5.320	5.320

b) Machinery

Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.000	6.000	6.000
Consumables in sinking @10 Percent of (b)				

c) Overhead charges

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

d) Contractor's profit

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

Cost for 0.25m = a+b+c+d

Rate per metre = (a+b+c+d)/0.25

12.18 A

(ii) Beyond 3m upto 10m depth

Rate of sinking @ 0.038

m/hour

a) Labour

Mate	day	0.386	0.386	0.386
Sinker	day	3.325	3.325	3.325
Sinking helper (semi-skilled)	day	6.318	6.318	6.318

b) Machinery

Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.500	6.500	6.500
Consumables in sinking @10 Percent of (b)				

c) Overhead charges

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

d) Contractor's profit

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

Cost for 0.25m = a+b+c+d

Rate per metre = (a+b+c+d)/0.25

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.18 A	(iii)	Beyond 10m upto 20m		a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter		
12.18 A	(iv)	Beyond 20m upto 30 m		a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.18 A	(v)	Beyond 30m upto 40 m		a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.18	B	Clayey Soil (12 m dia. Well) Unit = Running Meter. Taking output = 0.25 meter.					
	(i)	Depth below bed level upto 3.0 M			Rate of sinking @ 0.04 m/hour		
	a)	Labour			Mate day	0.399	0.399
		Sinker (skilled)			day	3.990	3.990
		Sinking helper (semi-skilled)			day	5.985	5.985
	b)	Machinery			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.250
		Consumables in sinking @ 10 Percent of (b)					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 0.25m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.25					
12.18 B	(ii)	Beyond 3m upto 10m depth			Rate of sinking @ 0.03 m/hour		
	a)	Labour			Mate day	0.519	0.519
		Sinker			day	4.988	4.988

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	7.980	7.980	7.980	
	b) Machinery						
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.330	8.330	8.330	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.500	4.500	4.500	
		Consumables in sinking @ 10 Percent of (b)					
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 0.25m = a+b+c+d					
		Rate per metre = (a+b+c+d)/0.25					
12.18 B	(iii) Beyond 10 m upto 20 m						
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add for dewatering @ 5 Percent of cost, if required.					
12.18 B	(iv) Beyond 20m upto 30 m						
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering on the cost, if required					
	c	Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.18 B	(v) Beyond 30m upto 40 m						
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 5 Percent of cost for dewatering, if required					
	c	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).					
12.18	C Extra over item no. 12.18 (A) or (B) irrespective of depth for sinking in Soft Rock (12 m dia well)						
		Unit = Running Meter.					

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

Taking output = 1 m

a) Labour

Mate	day	1.290	1.290	1.290
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Mazdoor	day	26.600	26.600	26.600

b) Machinery

Air Compressor 250 cfm	hour	113.097	113.097	113.097
Pneumatic breaker	hour	226.195	226.195	226.195

Consumables in sinking

@ 5 Percent of (b)

Add for dewatering @ of
15 Percent of (a+b), if
required

Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000
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c) Overhead charges

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

d) Contractor's profit

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

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

12.18

D Extra over item no. 12.18 (A) or (B) irrespective of depth for sinking in Hard Rock (12 m dia well)

Unit = Running Meter

Taking output = 1 m

a) Material

Small dia.Explosive at 0.20 kg / cum	kg	22.619	22.619	22.619
Electric detonators	no	122.000	122.000	122.000
Detonating fuse coil	m	379.000	379.000	379.000

b) Labour

Mate	day	1.303	1.303	1.303
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Driller	day	2.660	2.660	2.660
Blaster	day	0.333	0.333	0.333
Mazdoor	day	23.940	23.940	23.940

c) Machinery

Air Compressor 250 cfm	hour	82.361	82.361	82.361
Pneumatic breaker	hour	90.478	90.478	90.478
Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	58.245	58.245	58.245

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					
12.18	E	Extra over item no. 12.18 (A) or (B) irrespective of depth for sinking in rock bouldery strata (12 m dia well)					
		Unit = Running Meter					
		Taking output = 1 m					
	a)	Labour					
		Mate	day	1.184	1.184	1.184	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	23.940	23.940	23.940	
	b)	Machinery					
		Air Compressor 250 cfm	hour	188.496	188.496	188.496	
		Pneumatic breaker	hour	376.991	376.991	376.991	
		Consumables in sinking @ 5 Percent of (b)					
		Add for dewatering @ of 15 Percent of (a+b), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19	1200	Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
		Unit = Running Meter					
		Taking output = 1 m					
		Dimensions of well.					
		Overall length = 12 m					
		Overall width = 6 m					
A	Sandy Soil						
(i)	Depth from bed level upto 3.0 M						
		Rate of sinking @ 0.18 m/hour					
	a)	Labour					
		Mate	day	0.266	0.266	0.266	
		Sinker (skilled)	day	1.663	1.663	1.663	
		Sinking helper (semi-skilled)	day	4.988	4.988	4.988	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.500	5.500	5.500	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.17 m/hour					
	a)	Labour					
		Mate	day	0.293	0.293	0.293	
		Sinker	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.880	5.880	5.880	
		Consumables in sinking @10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.19 A	(iii)	Beyond 10m upto 20m					
	a	Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
12.19 A	(iv)	Beyond 20m upto 30 m					
	a	Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour.					
12.19 A	(v)	Beyond 30m upto 40 m					
	a	Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter					
	b	Add 20 Percent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
12.19	B	Clayey Soil (Twin D Type Well)					
		Unit = Running Meter					
		Taking output = 1 meter					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.16 m/hour					
	a)	Labour					
		Mate	day	0.346	0.346	0.346	
		Sinker (skilled)	day	3.325	3.325	3.325	
		Sinking helper (semi-skilled)	day	5.320	5.320	5.320	
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.250	6.250	6.250	
		Consumables in sinking @ 10 Percent of (b)					
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per metre = (a+b+c+d)					
12.19 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.15 m/hour					
	a)	Labour					
		Mate	day	0.492	0.492	0.492	
		Sinker	day	4.323	4.323	4.323	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Sinking helper (semi-skilled)	day	7.980	7.980	7.980	
	b) Machinery						
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.670	6.670	6.670	
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.500	4.500	4.500	
		Consumables in sinking @ 10 Percent of (b)					
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	Rate per metre = (a+b+c+d)						

- 12.19 B (iii) Beyond 10 m upto 20 m**
- a Add 5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter
 - b Add for dewatering @ 5 Percent of cost, if required.
- 12.19 B (iv) Beyond 20m upto 30 m**
- a Add 7.5 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter
 - b Add 5 Percent of cost for dewatering on the cost, if required
 - c Add 25 Percent of cost for Kentledge including supports, loading arrangement and Labour).
- 12.19 B (v) Beyond 30m upto 40 m**
- a Add 10 Percent for every additional meter depth of sinking over the rate of sinking for the previous meter
 - b Add 5 Percent of cost for dewatering, if required
 - c Add 20 Percent of cost for Kentledge including supports, loading arrangement and Labour).

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.19	C	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	0.971	0.971	0.971	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Mazdoor	day	18.620	18.620	18.620	
	b)	Machinery					
		Air Compressor 250 cfm	hour	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	0.984	0.984	0.984	
		Sinker (skilled)	day	1.995	1.995	1.995	
		Sinking helper (semi-skilled)	day	2.993	2.993	2.993	
		Diver	day	0.665	0.665	0.665	
		Driller	day	2.660	2.660	2.660	
		Blaster	day	0.333	0.333	0.333	
		Mazdoor	day	15.960	15.960	15.960	
	c)	Machinery					
		Air Compressor 250 cfm	hour	50.260	50.260	50.260	
		Pneumatic breaker	hour	51.419	51.419	51.419	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Pneumatic breaker for drilling holes (@ 4.5 m per hour)	hour	33.101	33.101	33.101	
		Consumables in protected blasting @ 10 Percent of (c)					
		Add for dewatering @ of 15 Percent of (a+b+c), if required					
		Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.	hour	3.000	3.000	3.000	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per metre = (a+b+c+d+e)					

12.19 E Extra over item no. 12.19 (A) or (B) irrespective of depth for sinking in rock bouldery strata

Unit = Running Meter

Taking output = 1 m

a) Labour

Mate	day	0.865	0.865	0.865
Sinker (skilled)	day	1.995	1.995	1.995
Sinking helper (semi-skilled)	day	2.993	2.993	2.993
Diver	day	0.665	0.665	0.665
Mazdoor	day	15.960	15.960	15.960

b) Machinery

Air Compressor 250 cfm	hour	107.124	107.124	107.124
Pneumatic breaker	hour	214.248	214.248	214.248

Consumables in sinking @ 5 Percent of (b)

Add for dewatering @ of 15 Percent of (a+b), if required

Additional Hire & running charges for shifting of crane (rock breaking time) with grab bucket of 0.75 cum capacity and accessories.

c) Overhead charges

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

d) Contractor's profit

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

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

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.20	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 platforms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause 1208.8 of MoRTH Specifications.					
		Unit = cum					
		Taking output = 5 cum					
	a)	Material					
		M35 grade RCC corbel Cum provided for supporting of equipment (Dimensions as per ground conditions). Rate for concrete may be adopted vide item no. 12.08 (F)		8.000	8.000	8.000	
		HYSD bar reinforcement in tonne corbel		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		2.500	2.500	2.500	
		Driller day		1.330	1.330	1.330	
		Blaster day		0.665	0.665	0.665	
		Mazdoor (for cutting, blasting, cleaning, removal of Material etc.) day		39.900	39.900	39.900	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor (Skilled) (for fixation and removal of adopter for air lock, carrying out mechanical and electrical operations and repairs and other skilled jobs.)	day	13.300	13.300	13.300	
		Diver	day	5.320	5.320	5.320	
		Medical Officer	day	0.665	0.665	0.665	
		Para medical personnel	day	1.330	1.330	1.330	
c)	Machinery						
	(i)	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.	hour	6.000	6.000	6.000	
		Induction and deinduction	L.S				
		Erection at site and commissioning	L.S				
		Usage of plant and equipment for pneumatic method of well sinking	hour	6.000	6.000	6.000	
		Air compressor 250 cfm, 2 nos.	hour	12.000	12.000	12.000	
		Hire and running charges of crane of 15 tonne capacity	hour	6.000	6.000	6.000	
		Motorised barge of 20 tonne capacity	hour	6.000	6.000	6.000	
		Boat to carry atleast 20 persons	hour	6.000	6.000	6.000	
		Electric generating set 33 KVA	hour	6.000	6.000	6.000	
		Tipper 10 tonne capacity	hour	6.000	6.000	6.000	
d)	Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e)	Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 5 cum = a+b+c+d+e (see notes below)					
		Rate per cum = (a+b+c+d+e)/5					

- Note**
1. The cost of induction, deinduction and erection of equipment shall be divided by the total quantity of pneumatic sinking for all the wells of a particular bridge to arrive at the per cum rate on account of this item.
 2. Cost of pneumatic sinking per cum of individual wells will be added to the cost indicated at (1) above to arrive at the final rate of pneumatic sinking per cum.
 3. The cost of induction and deinduction will depend upon the distance involved for shifting of equipment which may be assessed in individual cases as per actual ground conditions at the time of making of cost estimates.
 4. In case pneumatic sinking is involved on a dry bed, the provision of barge and boat may be omitted.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
				5.	The necessity and dimensions of the corbel will be as per actual ground conditions.		
				6.	Small equipments like welding sets, pumps, vibrators, pneumatic tools, portable lamps, fire extinguishers, hose pipes etc., have not been included as the same are covered as items of minor T&P under overhead charges.		
				7.	Depth of sinking shall be restricted to 30 m.		
12.21	1207	Sand Filling in Wells complete as per Drawing and Technical Specifications.					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Sand (assuming 20 Percent voids)	cum	1.200	1.200	1.200	
		b) Labour					
		Mate	day	0.016	0.016	0.016	
		Mazdoor	day	0.399	0.399	0.399	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum (a+b+c+d)					
12.22	1200 & 1900	Providing Steel Liner 10 mm thick for Curbs and 6 mm thick for Steining of Wells including Fabricating and Setting out as per Detailed Drawing.					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					
		i) Structural steel including 5 Percent wastage	tonne	1.050	1.050	1.050	
		b) Labour					
		Mate	day	1.064	1.064	1.064	
		Fitter	day	5.320	5.320	5.320	
		Blacksmith	day	5.320	5.320	5.320	
		Welder	day	5.320	5.320	5.320	
		Mazdoor	day	10.640	10.640	10.640	
		Electrodes, cutting gas and other consumables @ 5 Percent on cost a (a) above.					
		c) Machinery					
		Hydra Crane of capacity 10T for lifting shifting	hour	8.000	8.000	8.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate for per MT (a+b+c+d+e)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
12.23	1100 & 1700	<p>Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.</p> <p>Pile diameter-750 mm</p> <p>Unit = meter</p> <p>Taking output = 25 m</p> <p>a) Materials</p> <p>RCC Grade M35 cum 11.490 11.486 11.486</p> <p>(including additional concreteing of 1m for pile head) Rate for concrete may be adopted vide item no. 12.11 F (iv)</p> <p>Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)</p> <p>Concrete to be cast with a tremie pipe 200mm dia.</p> <p>Bentonite kg 574.500 574.322 574.322</p> <p>b) Machinery(for boring and construction)</p> <p>Hire and running charges hour 6.000 6.000 6.000</p> <p>of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.</p> <p>Hire and running charges hour 3.138 3.138 3.138</p> <p>of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc</p> <p>Hire and running charges hour 6.000 6.000 6.000</p> <p>of Bentonite pump</p> <p>Transit truck agitator</p> <p>For transportation tonne-km 29.07 x L1 29.07 x L1 29.07 x L1</p> <p>(6 cum Capacity)</p> <p>For unloading hour 0.638 0.638 0.638</p> <p>Front end loader for removing muck</p> <p>(i) 3.1 Cum Capacity hour 0.407</p> <p>(ii) 2.1 Cum Capacity hour 0.598</p> <p>(iii) 1 Cum Capacity hour 1.276</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Tipper							
		For Loading time					
		(i) 18 cum capacity	hour	0.407			
		(ii) 14 cum capacity	hour		0.598		
		(iii) 10 cum capacity	hour			1.276	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	18.384			
		(ii) 14 cum capacity	t.km		18.378		
		(iii) 10 cum capacity	t.km			18.378	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+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 cum		20.420	20.420	20.420	
		(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.					
		Bentonite kg		1021.018	1021.018	1021.018	
		b) Machineryb (for boring and construction)					
		Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.000	6.000	6.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hire and running charges of light crane for lowering reinforcement cage, trime pipe, holding trime pipe for concreting, removal of temporary casing etc	hour	3.634	3.634	3.634	
		Hire and running charges of Bentonite pump	hour	6.000	6.000	6.000	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	51.05 x L1	51.05 x L1	51.05 x L1	
		For unloading	hour	1.134	1.134	1.134	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	0.724			
		(ii) 2.1 Cum Capacity	hour		1.064		
		(iii) 1 Cum Capacity	hour			2.269	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	0.724			
		(ii) 14 cum capacity	hour		1.064		
		(iii) 10 cum capacity	hour			2.269	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	32.673			
		(ii) 14 cum capacity	t.km		32.673		
		(iii) 10 cum capacity	t.km			32.673	
c)		Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
d)		Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
e)		Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+d+e					
		Rate per metre (a+b+c+d+e)/25					

12.25 1100 & 1700

Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.

A Pile diameter-1200 mm

Unit = meter

Taking output = 25 m

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		a) Materials					
		RCC Grade M35 cum		29.405	29.405	29.405	
		(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.					
		Bentonite kg		1470.265	1470.265	1470.265	
		b) Machinery (for boring and construction)					
		Hire and running charges hour		7.000	7.000	7.000	
		of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.					
		Hire and running charges hour		4.134	4.134	4.134	
		of light crane for lowering reinforcement cage, tremie pipe, holding tremie pipe for concreting, removal of temporary casing etc					
		Hire and running charges hour		7.000	7.000	7.000	
		of Bentonite pump					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	73.53 x L1	73.53 x L1	73.53 x L1	
		For unloading	hour	1.634	1.634	1.634	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	1.043			
		(ii) 2.1 Cum Capacity	hour		1.532		
		(iii) 1 Cum Capacity	hour			3.267	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	1.043			
		(ii) 14 cum capacity	hour		1.532		
		(iii) 10 cum capacity	hour			3.267	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	47.048			
		(ii) 14 cum capacity	t.km		47.048		
		(iii) 10 cum capacity	t.km			47.048	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
		d) Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
		e) Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+d+e					
		Rate per metre (a+b+c+d+e)/25					
12.26	1100 & 1700	Pile diameter-1500 mm					
		Unit = meter					
		Taking output = 25 m					
		a) Materials					
		RCC Grade M35 (including additional concreteing of 1 m for pile head) Rate for concrete may be adopted vide item no. 12.11 F (iv)	cum	45.946	45.946	45.946	
		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, tremie pipe, holding tremie pipe for concreting, removal of temporary casing etc	hour	5.053	5.053	5.053	
		Hire and running charges of Bentonite pump	hour	8.000	8.000	8.000	
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	114.86 x L1	114.86 x L1	114.86 x L1	
		For unloading	hour	2.553	2.553	2.553	
		Front end loader for removing muck					
		(i) 3.1 Cum Capacity	hour	1.629			

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 2.1 Cum Capacity	hour		2.393		
		(iii) 1 Cum Capacity	hour			5.105	
		Tipper					
		For Loading time					
		(i) 18 cum capacity	hour	1.629			
		(ii) 14 cum capacity	hour		2.393		
		(iii) 10 cum capacity	hour			5.105	
		For disposal of muck from pile bore hole up to a lead of 1 km					
		(i) 18 cum capacity	t.km	73.513			
		(ii) 14 cum capacity	t.km		73.513		
		(iii) 10 cum capacity	t.km			73.513	
	c)	Labour					
		Mate/Supervisor	day	0.186	0.186	0.186	
		Mazdoor	day	4.655	4.655	4.655	
	d)	Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
	e)	Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 25 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/25					
12.27	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile diameter - 750 mm					
		Unit = Running meter					
		Taking output = 40 metre					
	a)	Materials					
		RCC Grade M35	cum	17.660	17.660	17.660	
		Rate for concrete may be adopted vide item no. 12.11 F (iv)					
		Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)					
	b)	Materials Pile shoes					
	i)	C.I. shoes for the pile	Kg	160.000	160.000	160.000	
	ii)	M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000	
	iii)	Steel helmet and cushion block on top of casing head during driving	Kg	50.000	50.000	50.000	
	c)	Machinery					
		Hire and running charges of piling rig Including double acting pile driving hammer complete with	hour	6.000	6.000	6.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		power unit and accessories.					
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.500	0.500	0.500	
d)	Labour						
	Mate/Supervisor	day	0.160	0.160	0.160		
	Mazdoor	day	3.990	3.990	3.990		
e)	Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)		
f)	Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)		
	Cost for 40 m = a+b+c+d+e						
	Rate per metre (a+b+c+d+e)/40						

- Note**
1. The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.
 2. In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 Percent of cost of concrete may be provided to cover its usage.

12.28 1100 & 1700

Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification

Pile diameter - 1000 mm

Unit = Running meter

Taking output = 30 metre

a) Materials

RCC Grade M35	cum	23.550	23.550	23.550
Rate for concrete may be adopted vide item no. 12.11 F (iv)				
Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)				

b) Materials Pile shoes

i) C.I. shoes for the pile	Kg	160.000	160.000	160.000
ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000
iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.000	50.000	50.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.		hour	6.000	6.000	6.000	
	Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.		hour	0.500	0.500	0.500	
	Hire and running charges for light crane for lowering reinforcement cage.		hour	0.500	0.500	0.500	
d)	Labour						
	Mate/Supervisor		day	0.213	0.213	0.213	
	Mazdoor		day	5.320	5.320	5.320	
e)	Overhead charges			@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
f)	Contractor's profit			@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	

Cost for 30 m = a+b+c+d+e

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

- Note**
1. The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.
 2. In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 Percent of cost of concrete may be provided to cover its usage.

12.29 1100 & 1700

Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification

Pile diameter - 1200 mm

Unit = Running meter

Taking output = 20 metre

a) Materials

RCC Grade M35	cum	22.610	22.610	22.610
Rate for concrete may be adopted vide item no. 12.11 F (iv)				

Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)

b) Materials Pile shoes

i) C.I. shoes for the pile	Kg	160.000	160.000	160.000
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.000	70.000	70.000	
		iii) Steel helmet on top of casing head during driving	Kg	50.000	50.000	50.000	
c)	Machinery						
		Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.500	0.500	0.500	
d)	Labour						
		Mate/Supervisor	day	0.213	0.213	0.213	
		Mazdoor	day	5.320	5.320	5.320	
e)	Overhead charges			@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
f)	Contractor's profit			@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	

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

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

- Note**
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)				

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Material Pile shoes					
		a) C.I Shoes	Kg	240.000	240.000	240.000	
		b) M.S. shoes	Kg	105.000	105.000	105.000	
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.000	30.000	30.000	
		c) Machinery					
		Crane 20 t capacity	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		d) Labour					
		Mate/Supervisor	day	0.160	0.160	0.160	
		Mazdoor	day	3.990	3.990	3.990	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	

Cost for 60 m = a+b+c+d+e+f

Rate per metre (a+b+c+d+e+f)/60

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

12.31 1100 & 1700

Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification

Pile Diameter = 750 mm

Unit = Running Meter

Taking output = 50 m

a) Materials

RCC Grade M35	cum	22.080	22.080	22.080
Rate for concrete may be adopted vide item no.				

12.11 F (iv)

Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)

b) Material Pile shoes

a) C.I. shoes	Kg	160.000	160.000	160.000
b) M.S. shoes	Kg	70.000	70.000	70.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	40.000	40.000	40.000	
		c) Machinery					
		Crane 35 T capacity	hour	6.000	6.000	6.000	
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	
		d) Labour					
		Mate/Supervisor	day	0.213	0.213	0.213	
		Mazdoor	day	5.320	5.320	5.320	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					
		e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)	

Cost for 50 m = a+b+c+d+e+f

Rate per metre (a+b+c+d+e+f)/50

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

12.32 1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification
	Pile Diameter = 1000 mm
	Unit = Running Meter
	Taking output = 40 m
	a) Materials
	RCC Grade M35 cum 31.400 31.400 31.400
	Rate for concrete may be adopted vide item no. 12.11 F (iv)
	Rate for concrete may be adopted same as for pile vide item no. 12.11 F (iv)
	b) Material Pile shoes
	a) C.I. shoes for the pile Kg 160.000 160.000 160.000
	b) M.S. shoes @ 35 Kg per pile of 15 m Kg 70.000 70.000 70.000
	c) Steel helmet and cushion block on top of pile head during driving. Kg 50.000 50.000 50.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Crane 50 t capacity.		hour	6.000	6.000	6.000	
	Vibrating Pile driving hammer complete with power unit and accessories.		hour	6.000	6.000	6.000	
d)	Labour						
	Mate/Supervisor		day	0.266	0.266	0.266	
	Mazdoor		day	6.650	6.650	6.650	
	Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.						
e)	Overhead charges	@ on (b+c+d)		@ on (b+c+d)		@ on (b+c+d)	
f)	Contractor's profit	@ on (b+c+d+e)		@ on (b+c+d+e)		@ on (b+c+d+e)	
	Cost for 40 m = a+b+c+d+e+f						
	Rate per metre (a+b+c+d+e+f)/40						

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

12.33 1100&1 700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification
	Size of pile - 300 mm x 300 mm
	Unit = Running Meter
	Taking output = 60 m
a)	Materials
	RCC Grade M-35
	RCC Grade M35 cum 5.400 5.400 5.400
	Rate for concrete may be adopted vide item no. 12.11 F (iv)
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 Kg 30.000 30.000 30.000 cushion block on top of pile head during driving.
c)	Machinery
	Crane 10 tonne capacity hour 6.000 6.000 6.000
	Vibrating Pile driving hammer complete with power unit and accessories.

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

d) Labour							
Mate/Supervisor	day	0.160	0.160	0.160			
Mazdoor	day	3.990	3.990	3.990			
Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.							
e) Overhead charges		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)			
f) Contractor's profit		@ on (b+c+d+e)	@ on (b+c+d+e)	@ on (b+c+d+e)			
Cost for 60 m = a+b+c+d+e+f							
Rate per metre (a+b+c+d+e+f)/60							

Note The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.

12.34 1100 &1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification
	Size of pile - 500 mm x 500 mm
	Unit = Running Meter
	Taking output = 50 m
	a) Materials
	RCC Grade M-35
	RCC Grade M35 cum 12.500 12.500 12.500
	Rate for concrete may be adopted vide item no. 12.11 F (iv)
	b) Material Pile shoes
	a) C I shoes kg 160.000 160.000 160.000
	b) M. S shoes kg 70.000 70.000 70.000
	c) Steel helmet and Kg 30.000 30.000 30.000 cushion block on top of pile head during driving.
	c) Machinery
	Crane 20 tonne capacity hour 6.000 6.000 6.000
	Vibrating Pile driving hammer complete with power unit and accessories. hour 6.000 6.000 6.000
	d) Labour
	Mate/Supervisor day 0.213 0.213 0.213
	Mazdoor day 5.320 5.320 5.320
	Add 1 Percent of (a+b+c) for carriage of piles from

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

casting yard to work site and stacking, and other imponderables during installation.

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

@ 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	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
	&1700						
		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		0.213	0.213	0.213	
		Mazdoor day		5.320	5.320	5.320	
		Add 1 Percent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.					

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

e) Overhead charges @ on (b+c+d)
f) Contractor's profit @ on
@ 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 tonnes	6.040	6.040	6.040		
		5 Percent wastage @ 82.20 kg/m					
		b) Machinery					
		Crane 10 T capacity hour	6.000	6.000	6.000		
		Vibrating Pile driving hour	6.000	6.000	6.000		
		hammer complete with power unit and other accessories.					
		c) Labour					
		Mate/Supervisor day	0.160	0.160	0.160		
		Mazdoor day	3.990	3.990	3.990		
		Add 0.5 Percent of (a+b+c) for providing steel helmet on top of pile head during driving, stacking of piles at site, providing anti-corrosion treatment and other imponderables during installation.					
		d) Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
		e) Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		Cost for 70 m = a+b+c+d+e					
		Rate per metre (a+b+c+d+e)/70					
12.37	1100 &1900	Driven Vertical Steel Piles complete as per Drawing and & Technical Specification					
		Section of the pile - H Section steel column 450 x 250 mm (ISHB Series)					
		Unit = Running Meter					
		Taking output = 60 m					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Materials	Structural steel including 5 Percent wastage @92.50 kg/m	tonnes	5.830	5.830	5.830	
b)	Machinery	Crane 10 T capacity Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.000	6.000	6.000	6.000
c)	Labour	Mate/Supervisor Mazdoor 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.	day	0.186	0.186	0.186	0.186
d)	Overhead charges	@ on (a+b+c)		@ on (a+b+c)		@ on (a+b+c)	
e)	Contractor's profit	@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)	

Cost for 60 m = a+b+c+d+e

Rate per metre (a+b+c+d+e)/60

12.38 1100 **Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)**

Unit = 1 MT

Taking output = 1 MT

a)	Initial and routine load test	tonne	1.000	1.000	1.000
b)	Lateral load test	tonne	1.000	1.000	1.000

Note Although, this item is incidental to work and is not required to be included in BOQ of contract, the same is required to be added in the estimate to assess cost of work.

12.39 **Dismantling of Reinforced Concrete Pile head complete as per Drawing and Technical Specification**

Unit = cum

Taking output = 1.25 cum

a) Labour

Mate	day	0.053	0.053	0.053
Mazdoor with Pneumatic breaker	day	0.665	0.665	0.665
Blacksmith	day	0.333	0.333	0.333
Mazdoor for loading and unloading	day	0.333	0.333	0.333

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		b) Machinery					
		Air Compressor 250 cfm	hour	0.625	0.625	0.625	
		Pneumatic breaker	hour	1.250	1.250	1.250	
		Tipper					
		For transportation to dumping yard considering lead @ 1 km					
		(i) 18 cum capacity	t.km	1.875			
		(ii) 14 cum capacity	t.km		1.875		
		(iii) 10 cum capacity	t.km			1.875	
		Loading & unloading time					
		(i) 18 cum capacity	hour	0.208			
		(ii) 14 cum capacity	hour		0.250		
		(iii) 10 cum capacity	hour			0.292	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 1.25 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/ 1.25					

12.40	1100, 1500 &1700	Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification					
	A	RCC Grade M20					
	Case I	RCC Grade M20 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.06)	cum	60.000	60.000	60.000	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
		Case II	RCC Grade M20 using batching plant & manual placing				
			Unit = cum				
			Taking output = 60 cum				
		a) Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub- analysis 21.06)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum 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	Case I	RCC Grade M25				
			RCC Grade M25 using batching plant & Concrete pump				
			Unit = cum				
			Taking output = 60 cum				
		a) Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub- analysis 21.07)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					

Case II	RCC Grade M25 using batching plant & manual placing					
	Unit = cum					
Taking output = 60 cum						
	a)	Material				
		Per Cum Basic Cost (Rate taken from sub- analysis 21.07)	cum	60.000	60.000	60.000
	b)	Labour				
		For pouring and placing				
		Mate	day	0.479	0.479	0.479
		Mason	day	1.330	1.330	1.330
		Mazdoor	day	10.640	10.640	10.640
	c)	Machinery				
		Transit truck agitator				
		For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1
		For unloading	hour	3.333	3.333	3.333
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery				
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)
		Cost for 60 cum = a+b+c+d+e+f				
		Rate per cum = (a+b+c+d+e+f)/60				

12.40	C	RCC Grade M30												
		RCC Grade M30 using batching plant & Concrete pump												
Unit = cum														
Taking output = 60 cum														

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Material	Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	60.000	60.000	60.000	
b)	Labour						
	For pouring and placing						
	Mate	day	0.198	0.198	0.198	0.198	
	Mason	day	1.330	1.330	1.330	1.330	
	Mazdoor	day	3.626	3.626	3.626	3.626	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1	150 x L1	
	For unloading	hour	1.452	1.452	1.452	1.452	
	Hydraulic Boom placer pump	hour	1.452	1.452	1.452	1.452	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		

Cost for 60 cum = a+b+c+d+e+f

Rate per cum = $(a+b+c+d+e+f)/60$

**Case II RCC Grade M30 using
batching plant & manual
placing**

Unit = cum

Taking output = 60 cum

a) **Material**

Per Cum Basic Cost (Rate taken from sub-analysis 21.09)	cum	60.000	60.000	60.000
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b) **Labour**

For pouring and placing

Mate	day	0.479	0.479	0.479
Mason	day	1.330	1.330	1.330
Mazdoor	day	10.640	10.640	10.640

c) **Machinery**

Transit truck agitator				
For transportation (6 cum Capacity)	tonne-km	150 x L1	150 x L1	150 x L1
For unloading	hour	3.333	3.333	3.333

d) **Formwork @ 4 Percent**
on cost of concrete i.e.
cost of material, labour
and machinery

e) **Overhead charges**

@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
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CHAPTER: 12- FOUNDATIONS

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	cum	60.000	60.000	60.000	
		(Rate taken from sub- analysis 21.11)					
	b)	Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
	c)	Machinery					
		Transit truck agitator					
		For transportation	tonne- km	150 x L1	150 x L1	150 x L1	
		(6 cum Capacity)					
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
	d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
	Case II	RCC Grade M35 using batching plant & manual placing					
		Unit = cum					
		Taking output = 60 cum					
	a)	Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub- analysis 21.11)					
	b)	Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	

CHAPTER: 12- FOUNDATIONS

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

c) Machinery							
Transit truck agitator							
For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1			
For unloading	hour	3.333	3.333	3.333			
d) Formwork @ 4 Percent							
on cost of concrete i.e. cost of material, labour and machinery							
e) Overhead charges	@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)		
f) Contractor's profit	@ on (a+b+c+d+e)		@ on (a+b+c+d+e)		@ on (a+b+c+d+e)		
Cost for 60 cum = a+b+c+d+e+f							
Rate per cum = (a+b+c+d+e+f)/60							

12.40	E	RCC Grade M40					
		RCC Grade M40 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub- analysis 21.12)	cum	60.000	60.000	60.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1	
		For unloading	hour	1.452	1.452	1.452	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
		d) Formwork @ 4 Percent					
		on cost of concrete i.e. cost of material, labour and machinery					
		e) Overhead charges	@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)
		f) Contractor's profit	@ on (a+b+c+d+e)		@ on (a+b+c+d+e)		@ on (a+b+c+d+e)
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Case II					
		RCC Grade M40 using batching plant & manual placing					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub- analysis 21.12)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.479	0.479	0.479	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	150 x L1	150 x L1	150 x L1	
		(6 cum Capacity)					
		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	RCC Grade M45					
		Case I					
		RCC Grade M45 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 60 cum					
		a) Material					
		Per Cum Basic Cost	cum	60.000	60.000	60.000	
		(Rate taken from sub- analysis 21.13)					
		b) Labour					
		For pouring and placing					
		Mate	day	0.198	0.198	0.198	
		Mason	day	1.330	1.330	1.330	
		Mazdoor	day	3.626	3.626	3.626	
		c) Machinery					
		Transit truck agitator					
		For transportation	tonne- km	150 x L1	150 x L1	150 x L1	
		(6 cum Capacity)					
		For unloading	hour	1.452	1.452	1.452	

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	1.452	1.452	1.452	
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					
Case II	RCC Grade M45 using batching plant & manual placing						
	Unit = cum						
	Taking output = 60 cum						
a)	Material						
	Per Cum Basic Cost (Rate taken from sub- analysis 21.13)	cum	60.000	60.000	60.000		
b)	Labour						
	For pouring and placing						
	Mate	day	0.479	0.479	0.479		
	Mason	day	1.330	1.330	1.330		
	Mazdoor	day	10.640	10.640	10.640		
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne- km	150 x L1	150 x L1	150 x L1		
	For unloading	hour	3.333	3.333	3.333		
d)	Formwork @ 4 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 60 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/60					

**12.41 1100&1
700**

Levelling Course for Pile cap

**Providing and laying of PCC
M15 levelling course 100mm
thick below the pile cap.**

Case I

**PCC Grade M15 using
batching plant & Concrete
pump**

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)				
				Large	Medium	Small					
Unit = cum											
Taking output = 30 cum											
a)	Material										
	Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	30.000	30.000	30.000						
	Water for curing	kL	15.750	15.750	15.750						
b)	Labour										
	For pouring and placing										
	Mate	day	0.152	0.152	0.152						
	Mason	day	1.995	1.995	1.995						
	Mazdoor	day	1.813	1.813	1.813						
c)	Machinery										
	Transit truck agitator										
	For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1						
	For unloading	hour	0.726	0.726	0.726						
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726						
	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)										
	(i) 16 KL capacity	hour	0.219 x L1 + 0.656								
	(ii) 12 KL capacity	hour		0.292 x L1 + 0.875							
	(iii) 6 KL capacity	hour			0.583 x L1 + 1.75						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)						
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)						
Cost for 30 cum = a+b+c+d+e+f											
Rate per cum = (a+b+c+d+e+f)/30											
Case II	PCC Grade M15 using batching plant & manual placing										
	Unit = cum										
	Taking output = 15 cum										
a)	Material										
	Per Cum Basic Cost (Rate taken from sub-analysis 21.03)	cum	15.000	15.000	15.000						
	Water for curing	kL	7.875	7.875	7.875						

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Labour						
		For pouring and placing					
		Mate	day	0.505	0.505	0.505	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	10.640	10.640	10.640	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1	
		For unloading	hour	0.833	0.833	0.833	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and unloading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

12.42 1600 **Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.**
Unit = MT
Taking output = 8 MT

a)	Material						
	MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400		
	Binding wire	Kg	48.000	48.000	48.000		
b)	Labour for straightening, cutting, bending, shifting to site, tying and placing in position						
	Mate	day	0.213	0.213	0.213		
	Blacksmith	day	1.330	1.330	1.330		
	Mazdoor	day	3.990	3.990	3.990		
c)	Machinery						
	Cutting Machine	hour	5.333	5.333	5.333		
	Bending Machine	hour	5.333	5.333	5.333		

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Electric generator 15 KVA	hour	5.333	5.333	5.333	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading	hour				
		Time					
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
12.43	1600	Supplying, Fitting and Placing un-coated Mild steel reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		Unit = MT					
		Taking output = 8 MT					
	a)	Material					
		MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
	b)	Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
	c)	Machinery					
		Cutting Machine	hour	5.333	5.333	5.333	
		Bending Machine	hour	5.333	5.333	5.333	
		Electric generator 15 KVA	hour	5.333	5.333	5.333	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading	hour				
		Time					
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	

CHAPTER: 12- FOUNDATIONS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
d)	Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e)	Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Cost for 8 MT (a+b+c+d+e)							
Rate for per MT (a+b+c+d+e)/8							

CHAPTER – 13
BRIDGE SUBSTRUCTURE

PREAMBLES:

- 1 Although, Substructures are generally constructed in cement concrete, the rate analysis for brick and stone masonry in CM 1:3 have also been included which can be adopted if permitted by design.
- 2 The cost of formwork will vary with the height of the substructure. Provision has accordingly been made.
- 3 As the higher grade of concrete is costlier, the provision made for formwork on percentage basis has been suitably adjusted to make it comparable with other grades.
- 4 Bridge bearing, being commercial items produced by specialized firms with imported technology and parts, the rates for the same are required to be ascertained from the market for the approved design and technical specifications. These rates are not included in the analysis as they can vary from design to design and base on their loading arrangement and span variations, hence if required they maybe analysed for a particular project depending upon the loadings and design.
- 5 Filter media and backfilling behind abutments are required to be provided as per guidelines given in IRC: 78.
- 6 Weep holes shall be provided as per Clause 2706 of MoRT&H Specifications.
- 7 In case of roller-cum-rocker bearings, only full circular rollers are to be provided.
- 8 All bearings shall be set truly level so as to have full and even seating.
- 9 For elastomeric bearing pads, the concrete surface shall be leveled such that the variation is not more than 1.5 mm from a straight edge placed in any direction across the area.
- 10 The bearing should be procured only from those manufacturers who have been pre-qualified by the Ministry of Road Transport and Highways.
- 11 The bottoms of girders resting on the bearing shall be plane and truly horizontal.
- 12 For spans in grade, the bearing shall be placed horizontal by using sole plates for suitable designed RCC pedestals.

CHAPTER: 13- SUB-STRUCTURE

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 1st class	each	500.000	500.000	500.000	
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	0.240	0.240	0.240	
		Water for curing	KL	0.483	0.483	0.483	
		b) Labour					
		Mate	day	0.085	0.085	0.085	
		Mason	day	1.064	1.064	1.064	
		Mazdoor	day	1.064	1.064	1.064	
		Add for scaffolding @ 5 Percent of cost of material and labour					
		c) Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.02			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.027		
		(iii) 6 KL capacity	hour			0.018 x L1 + 0.054	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
13.02	1300 & 2200	Pointing with cement mortar (1:3) on brick work in substructure as per Technical Specifications Unit = 10 sqm Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate taken from sub-analysis 21.01 A)	cum	0.030	0.030	0.030	
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per 10 sqm (a+b+c+d)					
	Note	Scaffolding is already included in item 13.01					

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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	0.053	0.053	0.053	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.002 x L1 + 0.006			
		(ii) 12 KL capacity	hour		0.003 x L1 + 0.008		
		(iii) 6 KL capacity	hour			0.005 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 10 sqm (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	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b) Labour							
		Mate	day	0.128	0.128	0.128	
		Mason	day	1.596	1.596	1.596	
		Mazdoor	day	1.596	1.596	1.596	
		Add for scaffolding @ 5 Percent of cost of a) Material and b) Labour					
c) Machinery							
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.013 x L1 + 0.04			
		(ii) 12 KL capacity	hour		0.018 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.036 x L1 + 0.107	
d) Overhead charges							
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit							
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per cum (a+b+c+d+e)							

13.04

B Coursed rubble masonry

(first sort)

Unit = cum

Taking output = 1 cum

a) Material

Stone	cum	1.100	1.100	1.100
Through and bond stone	each	7.000	7.000	7.000
(7 no.x 0.24 m x 0.24 m x 0.39 m = 0.16 cum)				
Cement mortar 1:3	cum	0.300	0.300	0.300
(Rate taken from sub- analysis 21.01 A)				
Water for curing	KL	0.966	0.966	0.966

b) Labour

Mate	day	0.160	0.160	0.160
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.995	1.995	1.995
Add for scaffolding @ 5 Percent of cost of material and labour				

c) Machinery

Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)				
(i) 16 KL capacity	hour	0.013 x L1 + 0.04		
(ii) 12 KL capacity	hour		0.018 x L1 + 0.054	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour				0.036 x L1 + 0.107
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Rate per cum (a+b+c+d+e)						
13.04	C	Ashlar masonry (first sort)					
		Plain ashlar					
		Unit = cum					
		Taking output = 1 cum					
	a)	Material					
		Stone	cum	1.110	1.110	1.110	
		Through and bond stone	each	7.000	7.000	7.000	
		(7no.x0.24mx0.24mx0.39 m = 0.16 cu.m)					
		Cement mortar 1:3	cum	0.330	0.330	0.330	
		(Rate taken from sub-analysis 21.01 A)					
		Water for curing	KL	0.966	0.966	0.966	
	b)	Labour for masonry work					
		Mate	day	0.266	0.266	0.266	
		Mason	day	3.325	3.325	3.325	
		Mazdoor	day	3.325	3.325	3.325	
		Add for scaffolding @ 5 Percent of cost of a) Material and b) Labour					
	c)	Machinery					
		Water tanker (speed @ km/hr and return speed @ km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.013 x L1 + 0.04			
		(ii) 12 KL capacity	hour		0.018 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.036 x L1 + 0.107	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Rate per cum (a+b+c+d+e)						

Note The labours already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.

13.05 1500,
1700 &
2200 **Plain/Reinforced cement
concrete in sub-structure
complete as per drawing and
Technical Specifications**

13.05 A **PCC Grade M15**
(p) **Height upto 5m**
**PCC Grade M15 using batching
plant & Concrete pump**

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)				
				Large	Medium	Small					
Unit = cum											
Taking output = 30 cum											
a)	Material										
	Per Cum Basic Cost (Rate taken from sub-analysis -21.03)	cum	30.000	30.000	30.000						
	Water for curing	KI	15.750	15.750	15.750						
b)	Labour										
	For pouring and placing										
	Mate	day	0.152	0.152	0.152						
	Mason	day	1.995	1.995	1.995						
	Mazdoor	day	1.813	1.813	1.813						
c)	Machinery										
	Transit truck agitator										
	For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1						
	For unloading	hour	0.726	0.726	0.726						
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726						
	Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)	hour	0.219 x L1 + 0.656								
	(i) 16 KL capacity	hour		0.292 x L1 + 0.875							
	(ii) 12 KL capacity	hour			0.583 x L1 + 1.75						
	(iii) 6 KL capacity	hour									
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery										
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)						
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)						
Cost for 30 cum = a+b+c+d+e+f											
Rate per cum = (a+b+c+d+e+f)/30											

13.05

B PCC Grade M20

(p) Height upto 5m

PCC Grade M20 using batching
plant transit mixer & Concrete
pump

Unit = cum

Taking output = 30 cum

a)

Material

Per Cum Basic Cost
(Rate taken from sub-analysis -21.04)

cum

30.000

30.000

30.000

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	KI	15.750	15.750	15.750	
b) Labour							
		For pouring and placing					
		Mate	day	0.143	0.143	0.143	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.571	1.571	1.571	
c) Machinery							
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery							
e) Overhead charges							
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f) Contractor's profit							
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05	C PCC Grade M25 using batching plant transit mixer & Concrete pump
	Unit = cum
	Taking output = 30 cum
	a) Material
	Per Cum Basic Cost (Rate taken from sub-analysis -21.06)
	Water for curing
	b) Labour
	For pouring and placing
	Mate
	Mason
	Mazdoor

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	75 x L1	
	For unloading	hour	0.726	0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour	0.726	0.726	0.726	0.726	
	Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)						
	(i) 16 KL capacity	hour	0.219 x L1 + 0.656				
	(ii) 12 KL capacity	hour		0.292 x L1 + 0.875			
	(iii) 6 KL capacity	hour			0.583 x L1 + 1.75		
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges	@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)	
f)	Contractor's profit	@ on (a+b+c+d+e)		@ on (a+b+c+d+e)		@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05
C

(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
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Water for curing KI 15.750 15.750 15.750

b) Labour

For pouring and placing

Mate day 0.152 0.152 0.152
Mason day 1.995 1.995 1.995
Mazdoor day 1.813 1.813 1.813

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity) tonne-km 75 x L1 75 x L1 75 x L1

For unloading hour 0.726 0.726 0.726

Hydraulic Boom placer pump hour 0.726 0.726 0.726

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d)	Formwork @ 12 Percent on cost of concrete i.e. cost of material, labour and machinery						
	Add 2 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift						
e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
	Cost for 30 cum = a+b+c+d+e+f						
	Rate per cum = (a+b+c+d+e+f)/30						

13.05
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
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Water for curing

KI	15.750	15.750	15.750
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b) Labour

For pouring and placing

Mate	day	0.152	0.152	0.152
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Mason	day	1.995	1.995	1.995
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Mazdoor	day	1.813	1.813	1.813
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c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
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For unloading	hour	0.726	0.726	0.726
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Hydraulic Boom placer pump

Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d)	Formwork @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05

D PCC Grade M30

(p) Height upto 5m

PCC Grade M30 using batching
plant transit mixer & Concrete
pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis -21.08)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.152	0.152	0.152
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.813	1.813	1.813

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05
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	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.152	0.152	0.152
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.813	1.813	1.813

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

**Hydraulic Boom placer
pump**

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

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

d)	Formwork @ 12 Percent on cost of concrete i.e. cost of material, labour and machinery Add 2 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift						
e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)			
f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)			
Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30							

13.05

(r) Height above 10m

D

**PCC Grade M30 using batching
plant transit mixer & Concrete
pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis -21.08)	cum	30.000	30.000	30.000
Water for curing	kL	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.152	0.152	0.152
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.813	1.813	1.813

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer

pump

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

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

- d) **Formwork @ 15 Percent**
on cost of concrete i.e. cost of material, labour and machinery
Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift
- e) **Overhead charges** @ on (a+b+c+d)
- f) **Contractor's profit** @ 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	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726

Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656	
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875
(iii) 6 KL capacity	hour		0.583 x L1 + 1.75

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

- d) **Formwork** @ 10 Percent
on cost of concrete i.e.
cost of material, labour
and machinery
- e) **Overhead charges** @ on
(a+b+c+d) @ on
(a+b+c+d) @ on
(a+b+c+d)
- f) **Contractor's profit** @ on
(a+b+c+d+e) @ on
(a+b+c+d+e) @ on
(a+b+c+d+e)

Cost for 30 cum = a+b+c+d+e+f

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

13.05
E

(q) Height 5m to 10m

For height, upto 10m, add 2
Percent of cost as above
excluding formwork. For cost of
formwork add 12 Percent of
cost of material, labour and
machinery instead of 4 Percent.

**RCC Grade M20 using batching
plant transit mixer & Concrete
pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis -21.05)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656	
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875
(iii) 6 KL capacity	hour		0.583 x L1 + 1.75

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

d) Formwork @ 12
 Percent on cost of concrete i.e. cost of material, labour and machinery
 Add 2 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift

e) Overhead charges

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) Contractor's profit

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

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

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

Cost for 30 cum = a+b+c+d+e+f

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

13.05

(r) Height above 10m

E

Same as Item 12.08 (C) with the following changes: (i) Add 4 Percent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 Percent instead of 4 Percent of cost of material, labour and machinery.

RCC Grade M20 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.05)	cum	30.000	30.000	30.000
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Water for curing	KI	15.750	15.750	15.750
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b) Labour

For pouring and placing				
Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator				
For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726

Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
		d) Formwork @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					

13.05

F RCC Grade M25

(p) Height upto 5m

Same as Item 12.8 (E) upto 5m height, excluding formwork. For cost of formwork, add 10 Percent of cost of material, labour and machinery instead of 3.75 Percent.

RCC Grade M25 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	30.000	30.000	30.000
Water for curing	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
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For unloading

Hydraulic Boom placer pump

hour	0.726	0.726	0.726	0.726
hour	0.726	0.726	0.726	0.726

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

Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)	(i) 16 KL capacity	hour	0.219 x L1 + 0.656				
	(ii) 12 KL capacity	hour		0.292 x L1 + 0.875			
	(iii) 6 KL capacity	hour			0.583 x L1 + 1.75		

d) Formwork

Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork

e) Overhead charges

@ on (a+b+c+d)

f) Contractor's profit

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

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

Cost for 30 cum = a+b+c+d+e+f

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

13.05

(q) Height 5m to 10m

F

RCC Grade M25 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump	hour	0.726	0.726	0.726
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Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork							
Add @ 11.8 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork							
Add 1.8 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift							
e) Overhead charges							
@ on (a+b+c+d)							
f) Contractor's profit							
@ on (a+b+c+d+e)							

13.05
F

(r) Height above 10m

a) Material					
Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	30.000	30.000	30.000	
Water for curing	Kl	15.750	15.750	15.750	
b) Labour					
For pouring and placing					
Mate	day	0.206	0.206	0.206	
Mason	day	1.995	1.995	1.995	
Mazdoor	day	3.143	3.143	3.143	
c) Machinery					
Transit truck agitator					
For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
For unloading	hour	0.726	0.726	0.726	
Hydraulic Boom placer pump					
Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)	hour	0.219 x L1 + 0.656			
(i) 16 KL capacity	hour		0.292 x L1 + 0.875		
(ii) 12 KL capacity	hour			0.583 x L1 + 1.75	
(iii) 6 KL capacity	hour				

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

d) Formwork

Add @ 15 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork

Add 4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift

e) Overhead charges

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) Contractor's profit

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

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

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

Cost for 30 cum = a+b+c+d+e+f

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

13.05

G RCC Grade M30

(p) Height upto 5m

RCC Grade M30 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.09)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer

pump				
Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)	hour	0.219 x L1 + 0.656		

(i) 16 KL capacity	hour	0.219 x L1 + 0.656	
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour				0.583 x L1 + 1.75
	d)	Formwork		Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork			
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
				Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30			

13.05
G

(q) Height 5m to 10m

**RCC Grade M30 using batching
plant transit mixer & Concrete
pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis -21.09)	cum	30.000	30.000	30.000
Water for curing	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

d) Formwork

Add @ 11.5 Percent on
cost of concrete i.e. cost of
material, labour and
machinery (a+b+c) for

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

Formwork

Add 1.6 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift

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

Cost for 30 cum = a+b+c+d+e+f

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

13.05 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	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump	hour	0.726	0.726	0.726
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Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656
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(ii) 12 KL capacity	hour	0.292 x L1 + 0.875
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour				0.583 x L1 + 1.75
d) Formwork							
		Add @ 14 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3.5 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
	e) Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f) Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

13.05

H RCC Grade M35

(p) Height upto 5m

**RCC Grade M35 using batching
plant transit mixer & Concrete
pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis -21.11)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
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For unloading	hour	0.726	0.726	0.726
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**Hydraulic Boom placer
pump**

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
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(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	

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
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Water for curing

KI	15.750	15.750	15.750
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b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
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For unloading

hour	0.726	0.726	0.726
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**Hydraulic Boom placer
pump**

Water tanker (speed @
km/hr and return speed @
km/hr and 30 mins for
unloading)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork							
Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork							
Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift							
e) Overhead charges							
@ on (a+b+c+d)							
f) Contractor's profit							
@ on (a+b+c+d+e)							
Cost for 30 cum = a+b+c+d+e+f							
Rate per cum = (a+b+c+d+e+f)/30							

13.05

I RCC Grade M40

(p) Height upto 5m

RCC Grade M40 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump

Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork							
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)							
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)							

Cost for 30 cum = a+b+c+d+e+f

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

13.05 I

(q) Height 5m to 10m

For height, upto 10m, add 1.4 Percent of cost as above excluding formwork. For cost of formwork add 11 Percent of cost of material, labour and machinery .

RCC Grade M40 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	30.000	30.000	30.000
Water for curing	kI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump

Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork		Add @ 11 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
e) Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
f) Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		

Cost for 30 cum = a+b+c+d+e+f

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

13.05 I

(r) Height above 10m

For height, above 10m, add 3 Percent of cost as above excluding formwork. For cost of formwork add 13 Percent of cost of material, labour and machinery

RCC Grade M40 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
	d)	Formwork					
		Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05

J RCC Grade M45

(p) Height upto 5m

RCC Grade M45 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.13)	cum	30.000	30.000	30.000
Water for curing	kL	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
	d)	Formwork					
		Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05
J

(q) Height 5m to 10m

For height, upto 10m, add 1.4 Percent of cost as above excluding formwork. For cost of formwork add 11 Percent of cost of material, labour and machinery.

RCC Grade 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	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork							
		Add @ 11 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

13.05

(r) Height above 10m

J

For height, above 10m, add 3 Percent of cost as above excluding formwork. For cost of formwork add 13 Percent of cost of material, labour and machinery

RCC Grade M45 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis - 21.13)	cum	30.000	30.000	30.000
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Water for curing KI 15.750 15.750 15.750

b) Labour

For pouring and placing

Mate day 0.206 0.206 0.206
Mason day 1.995 1.995 1.995

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	3.143	3.143	3.143	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km		75 x L1	75 x L1	75 x L1	
	For unloading	hour		0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour		0.726	0.726	0.726	
	Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)						
	(i) 16 KL capacity	hour		0.219 x L1 + 0.656			
	(ii) 12 KL capacity	hour			0.292 x L1 + 0.875		
	(iii) 6 KL capacity	hour				0.583 x L1 + 1.75	
d)	Formwork						
	Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork						
	Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05

K RCC Grade M50

RCC Grade M50 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	cum	30.000	30.000	30.000
Water for curing	kI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km		75 x L1	75 x L1	75 x L1	
	For unloading	hour		0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour		0.726	0.726	0.726	
	Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)						
	(i) 16 KL capacity	hour		0.219 x L1 + 0.656			
	(ii) 12 KL capacity	hour			0.292 x L1 + 0.875		
	(iii) 6 KL capacity	hour				0.583 x L1 + 1.75	
d)	Formwork						
	Add @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05
K

(q) Height 5m to 10m

For height, upto 10m, add 1.4 Percent of cost as above excluding formwork. For cost of formwork add 11 Percent of cost of material, labour and machinery.

RCC Grade M50 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km		75 x L1	75 x L1	75 x L1	
	For unloading	hour		0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour		0.726	0.726	0.726	
	Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)						
	(i) 16 KL capacity	hour		0.219 x L1 + 0.656			
	(ii) 12 KL capacity	hour			0.292 x L1 + 0.875		
	(iii) 6 KL capacity	hour				0.583 x L1 + 1.75	
d)	Formwork						
	Add @ 11 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork						
	Add 1.4 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

13.05
K

(r) Height above 10m

For height, above 10m, add 3 Percent of cost as above excluding formwork. For cost of formwork add 13 Percent of cost of material, labour and machinery

RCC Grade M50 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.14)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Labour						
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ km/hr and return speed @ km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d)	Formwork						
		Add @ 13 Percent on cost of concrete i.e. cost of material, labour and machinery (a+b+c) for Formwork					
		Add 3 Percent of cost of material, Labour and machinery excluding formwork to cater for extra lift					
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/30					

Note The basic components of this analysis are the same as those of items 13.08 (A to K). The only changes are as under:

- 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.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.06	Section 1600 & 2200	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications Unit = MT Taking output = 8 MT					
		a) Material MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	6.667	6.667	6.667	
		Bending Machine	hour	6.667	6.667	6.667	
		Electric generator 15 KVA	hour	6.667	6.667	6.667	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
13.07	Section 1600 & 2200	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification Unit = MT Taking output = 8 MT					
		a) Material MS bars including 5 Percent overlaps and	tonne	8.400	8.400	8.400	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		wastage					
		Binding wire	Kg	48.000	48.000	48.000	
b)		Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
c)		Machinery					
		Cutting Machine	hour	6.667	6.667	6.667	
		Bending Machine	hour	6.667	6.667	6.667	
		Electric generator 15 KVA	hour	6.667	6.667	6.667	
		Tipper					
		Tipper for Transportation					
		(i) 18 cum capacity	t.km	8 x L1			
		(ii) 14 cum capacity	t.km		8 x L1		
		(iii) 10 cum capacity	t.km			8 x L1	
		Loading & Unloading Time	hour				
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
d)		Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e)		Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					

13.08 2706 & 2200 Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V: 20H towards drawing foce. Complete as per drawing and Technical Specifications

Unit = Nos.

Taking output = 30 Nos.

a) **Material**

AC pipe 100 mm dia. metre 31.500 31.500 31.500
(including wastage @ 5 Percent)

Average length of weep hole is taken as one metre for the purpose of estimating.

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		MS clamp	each	30.000	30.000	30.000	
		collar for AC pipe	each	10.000	10.000	10.000	
		(average) taking 10% of above pipe rate					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.01 A)	cum	0.050	0.050	0.050	
	b)	Labour					
		Mate	day	0.040	0.040	0.040	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.333	0.333	0.333	
	c)	Overhead charges @ on (a+b)					
	d)	Contractor's profit @ on (a+b+c)					
		Cost for 30 m = a+b+c+d					
		Rate per m (a+b+c+d)/30					

- Note**
1. In case of stone masonry, the size of the weep hole shall be 150 mm x 80 mm or circular with 150 mm diameter.
 2. For structure in stone masonry, the weep holes shall be deemed to be included in the item of stone masonry work and shall not be paid separately.

13.09	710.1.4.of IRC:78 & 2200	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification					
		Unit = cum					
		Taking output = 10 cum					
	A	Granular material					
	a)	Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor	day	9.310	9.310	9.310	
	b)	Material					
		Granular material	cum	12.000	12.000	12.000	
	c)	Machinery					
		Plate compactor/power rammer	hour	2.500	2.500	2.500	
		Water Tanker 6 KL capacity	hour	0.050	0.050	0.050	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum of granular backfill = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					

13.09	B Sandy material	a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310	
	b)	Material					
		Sand	cum	12.000	12.000	12.000	

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

c)	Machinery						
	Plate compactor/ power rammer	hour	2.500	2.500	2.500		
d)	Overhead charges	@ on (a+b+c)	0.060	0.060	0.060	@ on (a+b+c)	@ on (a+b+c)
e)	Contractor's profit	@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)	

Cost for 10 cum of sandy backfill = a+b+c+d+e

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

- 13.10 710.1.4.of
IRC:78 and
2504.2** Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification.

Unit = cum

Taking output = 10 cum.

- a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310
Mazdoor (Skilled)	day	1.330	1.330	1.330

- b) Material

Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.000	12.000	12.000
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- c) Machinery

Water Tanker of 6 KL capacity	hour	0.060	0.060	0.060
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- d) Overhead charges

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

cost for 10 cum of Filter Media = a+b+c+d+e

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

- 13.11 704** Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. Geocomposite for planar drainage, realized by

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

thermobonding a draining core in extruded monofilaments with two filtering nonwoven geotextiles that may also be working as separation or protecting layers. The draining three dimensional core will have a "W" configuration as longitudinal parallel channels. Minimum thickness to be 7.2mm, with two filtering UV stabilized polypropylene nonwoven geotextile of minimum thickness of 0.75 mm having pores of 150 micron and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geocomposite having in plane flow capacity of 2.1 L / (m.s) at hydraulic gradient of 1.0 & 20 kpa pressure and tensile strength of 18 kN/m , with mass per unit area of 740 gsm, supplied in the form of roll for easy transportation to site of work as per detailed specification all complete as per directions of Engineer in charge.

Unit = Sqm

Taking output = 300 Sqm

a) Labour

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

b) Material

Geosynthetic Drainage Composite	sqm	300.000	300.000	300.000
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Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia pannels, overlaps and other protective elements for synthetic Composites and other miscelleneus activities required to complete the item in all respect including transpotarion & takes.

c) Overhead charges

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

d) Contractor's profit

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

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

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

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

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

b) Material

Geosynthetic Drainage Composite	sqm	300.000	300.000	300.000
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Add 10 Percent of the cost of synthetic Composites for wastage and accessories for joining sheets with the fascia pannels, overlaps and other protective elements for synthetic Composites and other miscelleneus activities required to complete the item in all respect including transpotarion & takes.

c) Overhead charges

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

d) Contractor's profit

@ on

(a+b+c) @ on

(a+b+c) @ on

(a+b+c) (a+b+c)

Cost for sqm = a+b+c+d

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

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
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 MoRTH 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 0.080 0.080 0.080 Mazdoor (Skilled) day 0.665 0.665 0.665 Mazdoor day 1.330 1.330 1.330					
		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 Add 1 Percent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.	each	1.000	1.000	1.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		cost for 250 tonnes capacity bearing = a+b+c+d					
		Rate per tonne capacity = (a+b+c+d)/250					
13.14	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 MoRTH 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 0.080 0.080 0.080 Mazdoor day 1.330 1.330 1.330 Mazdoor (Skilled) day 0.665 0.665 0.665					

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

b) Material

Forged steel roller bearing each 1.000 1.000 1.000
of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications
Add 1 Percent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.

c) Overhead charges

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

d) Contractor's profit

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

cost for 250 tonnes capacity bearing = a+b+c+d

Rate per tonne capacity = (a+b+c+d)/250

13.15 2000 & 2200

Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.

Unit: one tonne capacity

Considering a 80 tonne capacity bearing for this analysis

a) Labour

Mate	day	0.080	0.080	0.080
Mazdoor	day	1.330	1.330	1.330
Mazdoor (Skilled)	day	0.665	0.665	0.665

b) Material

PTFE sliding plate bearing assembly of 80 tonnes design load capacity duly painted complete with all its components as per drawing and Technical Specifications
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

CHAPTER: 13- SUB-STRUCTURE

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

13.16	2000 & 2200	<p>Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.</p> <p>Unit: one cubic centimetre</p> <p>Considering an elastomeric bearing of size 500 x 400 x 96 mm for this analysis.</p> <p>Overall volume - 19200 cu.cm</p> <p>Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm.</p> <p>Hence volume of elastometer = 14655 cu.cm.</p> <p>a) Labour</p> <table> <tbody> <tr> <td>Mate</td><td>day</td><td>0.080</td><td>0.080</td><td>0.080</td></tr> <tr> <td>Mazdoor</td><td>day</td><td>1.330</td><td>1.330</td><td>1.330</td></tr> <tr> <td>Mazdoor (Skilled)</td><td>day</td><td>0.665</td><td>0.665</td><td>0.665</td></tr> </tbody> </table> <p>b) Material</p> <table> <tbody> <tr> <td>Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.</td><td>each.</td><td>1.000</td><td>1.000</td><td>1.000</td></tr> </tbody> </table> <p>Add 1 Percent of cost of bearing assembly for foundation anchorage bolts and consumables.</p> <p>c) Overhead charges @ on (a+b) d) Contractor's profit @ on (a+b+c)</p> <p>Cost for 19200 cc of elastomeric bearing = a+b+c+d Rate per cc of elastomeric bearing = (a+b+c+d)/ 19200</p>	Mate	day	0.080	0.080	0.080	Mazdoor	day	1.330	1.330	1.330	Mazdoor (Skilled)	day	0.665	0.665	0.665	Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	each.	1.000	1.000	1.000
Mate	day	0.080	0.080	0.080																		
Mazdoor	day	1.330	1.330	1.330																		
Mazdoor (Skilled)	day	0.665	0.665	0.665																		
Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	each.	1.000	1.000	1.000																		
13.17	2000 & 2200	<p>Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.</p> <p>Unit: one tonne capacity</p>																				

CHAPTER: 13- SUB-STRUCTURE

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

Considering the sliding bearing of 80 tonnes design capacity for this analysis.

a) Labour

Mate	day	0.059	0.059	0.059
Mazdoor	day	0.998	0.998	0.998
Mazdoor (Skilled)	day	0.466	0.466	0.466

b) Material

Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.	each.	1.000	1.000	1.000
Add 1 Percent of cost of bearing assembly for foundation anchorage bolts and consumables.				

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

Cost for 80 tonnes of capacity bearing = a+b+c+d

13.18 2000 & 2200

Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved Technical Specifications.

Unit= one tonne capacity

Considering a Pot bearing assembly of 250 tonne capacity for this analysis.

a) Labour

Mate	day	0.106	0.106	0.106
Mazdoor	day	1.995	1.995	1.995
Mazdoor (Skilled)	day	0.665	0.665	0.665

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Material	Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/fabricated structural steel assemblies duly painted with all components as per clause 2006 and complete as per drawings and Technical Specifications. Add 1 Percent of cost of bearing assembly for foundation anchorage bolts and consumables.	Each	1.000	1.000	1.000	
c)	Overhead charges	@ on (a+b)		@ on (a+b)		@ on (a+b)	
d)	Contractor's profit	@ on (a+b+c)		@ on (a+b+c)		@ on (a+b+c)	
Cost for 250 tonnes capacity bearing = a+b+c+d Rate per tonne capacity = (a+b+c+d)/250							

13.19 Suggestive

Protection to substructure by using coal tar epoxy

Providing and applying two coats of Two component, high build, 100 % solid content, low VOC,, polycyclin aromatic hydrocarbon based, Pot life – 2 hrs @ 72 deg. F , Tack free – 4-6 hrs , DFT per coat 80 -120 microns (dry) coal tar epoxy coating with Coal tar

Unit = Sqm.

Taking output = 100 Sqm

a) Labour

Mate	day	0.360	0.360	0.360
Painter	day	6.000	6.000	6.000
Mazdoor	day	3.000	3.000	3.000

b) Material

Coal Tar Epoxy coating @ 0.5 Kg per Square Meter coverage including 5% wastage	Kg.	52.500	52.500	52.500
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Add 1 Percent of cost of abs towards miscellaneous (water, painting brush etc.).

c) Overhead charges

@ 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

CHAPTER: 13- SUB-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
13.20		Providing structural steel for sub-structure complete as per drawing and technical specifications					
Unit = MT							
Taking output = 10.00 MT							
a) Material Structural steel in plates, angles, etc including 5% wastage Nuts & bolts							
			tonne	10.500	10.500	10.500	
b) Labour (for cutting, bending, making holes, joining, welding and erecting in position)							
			Kg	105.000	105.000	105.000	
c) Machinery Mobile Hydraulic Crane 10 tonne capacity (For Fabrication) Crane 35 tonne capacity (For Loading & Unloading @ 1 hr for each operation) Crane 35 tonne capacity (For Lifting and Placing in Position @ 2 hrs) Trailer 30 tonne capacity for transporting to site. Applying 2 coats primer before painting of Truss and Girder (42 sqm/tonne) Painting of Truss and Girder Sundries @ 3% of the above							
			Hrs	40.000	40.000	40.000	
			Hrs	2.000	2.000	2.000	
			Hrs	2.000	2.000	2.000	
			Hrs	2+L/15	2+L/15	2+L/15	
			Lit	525.000	525.000	525.000	
			Lit	525.000	525.000	525.000	
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 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.

CHAPTER: 14- SUPER-STRUCTURE

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					
14.01A		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	KI	63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.218	0.218	0.218	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.452	3.452	3.452	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne- km	300 x L1	300 x L1	300 x L1	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01A		(i) For solid slab super- structure, 20-30 Percent of (a+b+c)					
		(p) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

CHAPTER: 14- SUPER-STRUCTURE

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

- d) Formwork and staging 20 Percent of (a+b+c)
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)

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

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

14.01A

- (q) Height 5m to 10m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

- d) Formwork and staging 25 Percent of (a+b+c)

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

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

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

14.01A

- (r) Height above 10m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

- d) Formwork and staging 30 Percent of (a+b+c)

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

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

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

14.01A

- (ii) For T-beam & slab, 25-35 Percent of (a+b+c)

- (p) Height upto 5m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

- d) Formwork and staging 25 Percent of (a+b+c)

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

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

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

CHAPTER: 14- SUPER-STRUCTURE

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

14.01A	(q)	Height 5m to 10m Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 30 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01A	(r)	Height above 10m					
	(ii)	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 RCC Grade M25

Case II Using Batching Plant,

Transit Mixer and

Concrete Pump

Unit = cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.07)	cum	120.000	120.000	120.000
Water for curing	kL	63.000	63.000	63.000

b) Labour

For pouring and placing

Mate	day	0.263	0.263	0.263
Mason	day	1.995	1.995	1.995
Mazdoor	day	4.592	4.592	4.592

c) Machinery

Transit truck

agitator

For transportation (6 cum Capacity), L1	tonne-km	300 x L1	300 x L1	301 x L1
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CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom	hour	2.905	2.905	2.905	
		placer pump					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	

**For formwork and staging
add the following:**

14.01B

(i) **For solid slab super-structure, 20-30 Percent of (a+b+c)**

(p) **Height upto 5m**

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

d) **Formwork and staging 20 Percent of (a+b+c)**

e) **Overhead charges**

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) **Contractor's profit**

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

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

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

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

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

14.01B

(i)

(q) **Height 5m to 10m**

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

d) **Formwork and staging 25 Percent of (a+b+c)**

e) **Overhead charges**

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) **Contractor's profit**

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

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

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

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

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

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01B	(i)	(r) Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 30 Percent of (a+b+c)					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01B	(ii)	(ii) For T-beam & slab, 25-35 Percent of (a+b+c)					
	(p)	(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					
14.01B	(ii)	(q) Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 30 Percent of (a+b+c)					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01B	(ii)	(r) Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

CHAPTER: 14- SUPER-STRUCTURE

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

- d) Formwork and staging 35 Percent of (a+b+c)
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)

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

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

14.01

C RCC Grade M 30

14.01C Using Batching Plant,
Transit Mixer and
Concrete Pump.

Unit = cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.09)	cum	120.000	120.000	120.000
Water for curing	Kl	63.000	63.000	63.000

b) Labour

For pouring and placing

Mate	day	0.263	0.263	0.263
Mason	day	1.995	1.995	1.995
Mazdoor	day	4.592	4.592	4.592

c) Machinery

Transit truck agitator

For transportation (6 tonne-cum Capacity) , L1 - lead in Kilometer	km	300 x L1	300 x L1	301 x L1
For unloading	hour	2.905	2.905	2.905

Hydraulic Boom placer pump	hour	2.905	2.905	2.905
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	0.875 x L1 + 2.625		

(i) 16 KL capacity	hour	0.875 x L1 + 2.625		
(ii) 12 KL capacity	hour		1.167 x L1 + 3.5	
(iii) 6 KL capacity	hour			2.333 x L1 + 7

For formwork and staging add the following:

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01C	(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)					
	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					
14.01C	(q)	Height 5m to 10m					
	(i)	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)					
	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					
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)					
	f)	Contractor's profit @ 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					

CHAPTER: 14- SUPER-STRUCTURE

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

- d) Formwork and staging 25 Percent of (a+b+c)
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/120

14.01C (ii) (q) Height 5m to 10m

- Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum
d) Formwork and staging 30 Percent of (a+b+c)
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/120

14.01C (ii) (r) Height above 10m

- Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum
d) Formwork and staging 35 Percent of (a+b+c)
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/120

14.01 D RCC/PSC Grade M35

Case II Using Batching Plant,

Transit Mixer and

Concrete Pump

Unit = cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.11)	cum	120.000	120.000	120.000
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Water for curing	Kl	63.000	63.000	63.000
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b) Labour

For pouring and placing

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	300 x L1	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	0.875 x L1 + 2.625			
		(i) 16 KL capacity	hour		1.167 x L1 + 3.5		
		(ii) 12 KL capacity	hour				
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01D	(i)	For solid slab super-structure, 18-28 Percent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 18 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

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

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

14.01D	(q)	Height 5m to 10m
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum
	d)	Formwork and staging 23 Percent of (a+b+c)

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(r)	Height above 10m					
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 28 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(ii)	For T-beam & slab, 23-33 Percent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 23 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01D	(q)	Height 5m to 10m					
	(ii)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 28 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01D	(ii)	(r) Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 33 Percent of (a+b+c)					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = $(a+b+c+d+e+f)/120$					
14.01D	(iii)	(s) For box girder and balanced cantilever, 38-58 Percent of cost of concrete.					
	(p)	(t) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 38 Percent of (a+b+c)					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = $(a+b+c+d+e+f)/120$					
14.01D	(iii)	(q) Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 48 Percent of (a+b+c)					
		e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
		f) Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = $(a+b+c+d+e+f)/120$					
14.01D	(iii)	(r) Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					

CHAPTER: 14- SUPER-STRUCTURE

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

- d) Formwork and staging 58 Percent of (a+b+c)
- e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
- f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)

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

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

14.01 E RCC/PSC Grade M-40

**14.01E Using Batching Plant,
Transit Mixer and
Concrete Pump**

Unit = cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.12)	cum	120.000	120.000	120.000
Water for curing	Kl	63.000	63.000	63.000

b) Labour

For pouring and placing

Mate	day	0.263	0.263	0.263
Mason	day	1.995	1.995	1.995
Mazdoor	day	4.592	4.592	4.592

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	300 x L1	300 x L1
For unloading	hour	2.905	2.905	2.905

Hydraulic Boom placer pump	hour	2.905	2.905	2.905
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	0.875 x L1 + 2.625		

(i) 16 KL capacity	hour	0.875 x L1 + 2.625		
(ii) 12 KL capacity	hour		1.167 x L1 + 3.5	
(iii) 6 KL capacity	hour			2.333 x L1 + 7

**For formwork and staging
add the following:**

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01E	(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)	@ 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	(q)	Height 5m to 10m					
	(i)	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)	@ 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	(r)	Height above 10m					
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 28 Percent of (a+b+c)					
	e)	Overhead charges @ on (a+b+c+d)		@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit @ on (a+b+c+d+e)		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ 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					

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Formwork and staging 23 Percent of (a+b+c)					
		e) Overhead charges	@ on	@ on	@ on		
			(a+b+c+d)	(a+b+c+d)	(a+b+c+d)		
		f) Contractor's profit	@ on	@ on	@ on		
			(a+b+c+d+e)	(a+b+c+d+e)	(a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(q)	Height 5m to 10m					
	(ii)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 28 Percent of (a+b+c)					
		e) Overhead charges	@ on	@ on	@ on		
			(a+b+c+d)	(a+b+c+d)	(a+b+c+d)		
		f) Contractor's profit	@ on	@ on	@ on		
			(a+b+c+d+e)	(a+b+c+d+e)	(a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(r)	Height above 10m					
	(ii)	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	@ on	@ on		
			(a+b+c+d)	(a+b+c+d)	(a+b+c+d)		
		f) Contractor's profit	@ on	@ on	@ on		
			(a+b+c+d+e)	(a+b+c+d+e)	(a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01E	(iii)	For cast-in-situ box girder, segment construction and balanced cantilever, 38-58 Percent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 38 Percent of (a+b+c)					
		e) Overhead charges	@ on	@ on	@ on		
			(a+b+c+d)	(a+b+c+d)	(a+b+c+d)		

CHAPTER: 14- SUPER-STRUCTURE

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					
14.01E (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					
14.01F	F	RCC/PSC Grade M-45					
		Unit = cum					
		Taking output = 120 cum					
	a)	Material					
		Per Cum Basic Cost cum 120.000 120.000 120.000					
		(Rate taken from sub-analysis -21.13)					
		Water for curing Kl 63.000 63.000 63.000					
	b)	Labour					
		For pouring and placing					
		Mate day 0.263 0.263 0.263					
		Mason day 1.995 1.995 1.995					
		Mazdoor day 4.592 4.592 4.592					

CHAPTER: 14- SUPER-STRUCTURE

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

c)	Machinery						
	Transit truck						
	agitator						
	For transportation (6 tonne-cum Capacity) , L1 - km lead in Kilometer		300 x L		300 x L		300 x L
	For unloading	hour	2.905		2.905		2.905
	Hydraulic Boom	hour	2.905		2.905		2.905
	placer pump						
	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)						
	(i) 16 KL capacity	hour	0.875 x L1 + 2.625				
	(ii) 12 KL capacity	hour			1.167 x L1 + 3.5		
	(iii) 6 KL capacity	hour					2.333 x L1 + 7

For formwork and staging add the following:

14.01F	(i)	For solid slab/voided slab super-structure, 16-26 Percent of cost of concrete (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 16 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		

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

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

14.01F	(q)	Height 5m to 10m					
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 21 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		

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

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

CHAPTER: 14- SUPER-STRUCTURE

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

14.01F (i) (r) Height above 10m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

d) Formwork and
staging 26 Percent
of (a+b+c)

e) Overhead charges

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) Contractor's profit

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

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

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

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

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

**14.01F (ii) (r) For T-beam & slab
including launching of
precast girders by
launching truss upto 40 m
span, 21-31 Percent of
cost of concrete.**

(p) Height upto 5m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

d) Formwork and
staging 21 Percent
of (a+b+c)

e) Overhead charges

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) Contractor's profit

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

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

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

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

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

14.01F (ii) (q) Height 5m to 10m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

d) Formwork and
staging 26 Percent
of (a+b+c)

e) Overhead charges

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

f) Contractor's profit

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

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

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

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

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

CHAPTER: 14- SUPER-STRUCTURE

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

- 14.01F (ii) 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.**
- 14.01F (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 (q) Height 5m to 10m**
- Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum
- e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
- f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
Rate per cum = (a+b+c+d+e+f)/120

CHAPTER: 14- SUPER-STRUCTURE

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

14.01F (iii) (q) Height above 10m

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

**d) Formwork and
staging 56 Percent
of (a+b+c)**

e) Overhead charges

@ on
(a+b+c+d)

@ on
(a+b+c+d)

@ on
(a+b+c+d)

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
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Water for curing	KI	63.000	63.000	63.000
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b) Labour

**For pouring and
placing**

Mate	day	0.263	0.263	0.263
Mason	day	1.995	1.995	1.995
Mazdoor	day	4.592	4.592	4.592

c) Machinery

**Transit truck
agitator**

For transportation (6 tonne-cum Capacity) , L1 - km lead in Kilometer	300 x L	300 x L	300 x L
---	---------	---------	---------

For unloading	hour	2.905	2.905	2.905
---------------	------	-------	-------	-------

**Hydraulic Boom
placer pump**

Water tanker (speed
@ 10 km/hr. and
return speed @ 15
km/hr. and 30 mins
for unloading)

(i) 16 KL capacity	hour	0.875 x L1 + 2.625		
--------------------	------	-----------------------	--	--

(ii) 12 KL capacity	hour		1.167 x L1 + 3.5	
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(iii) 6 KL capacity	hour			2.333 x L1 + 7
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**For formwork and
staging add the
following:**

CHAPTER: 14- SUPER-STRUCTURE

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

- 14.01G**
- (i) For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 Percent of cost of concrete
- (p) Height upto 5m
- Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum
- d) Formwork and staging 35 Percent of (a+b+c)
- e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
- f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
- Rate per cum = $(a+b+c+d+e+f)/120$

- 14.01G**
- (i) (q) Height 5m to 10m
- Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum
- d) Formwork and staging 45 Percent of (a+b+c) 45.000
- e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
- f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
- Rate per cum = $(a+b+c+d+e+f)/120$

- 14.01G**
- (i) (r) Height above 10m
- Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum
- d) Formwork and staging 55 Percent of (a+b+c) 55.000
- e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)
- f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)
- Cost for 120 cum = a+b+c+d+e+f
- Rate per cum = $(a+b+c+d+e+f)/120$

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.01	H	PSC Grade M- 55 Unit = cum Taking output = 120 cum					
		a) Material					
		Per Cum Basic Cost (Rate taken from sub-analysis -21.15)	cum	120.000	120.000	120.000	
		Water for curing	KI	63.000	63.000	63.000	
		b) Labour					
		For pouring and placing					
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
		c) Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne- km	300 x L	300 x L	300 x L	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		
		(iii) 6 KL capacity	hour			2.333 x L1 + 7	
		For formwork and staging add the following:					
14.01H	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35- 55 Percent of cost of concrete					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 35 Percent of (a+b+c)					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

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

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

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

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

14.01H (q) Height 5m to 10m

(i)

Basic Cost of Labour,
Material & Machinery
(a+b+c) for 120 cum

d) Formwork and staging 45 Percent of (a+b+c)

e) Overhead charges

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

Cost for 130 cum = a+b+c+d+e+f

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

14.01H (r) Height above 10m

(i)

**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

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

$$(a+b+c+d+e) \quad (a+b+c+d+e) \quad (a+b+c+d+e)$$

$$\text{Rate per cum} = (a+b+c+d+e+f)/120$$

Note

1. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.
2. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis.

14.01 | PSC Grade M- 60

Unit = cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost cum 120.000 120.000 120.000
(Rate taken from
sub-analysis -21.16)

Water for

Labour For pouring and placing

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
c)	Machinery						
	Transit truck						
	agitator						
	For transportation	tonne- (6 cum Capacity) , L1 km - lead in Kilometer		300 x L	300 x L	300 x L	
	For unloading	hour		2.905	2.905	2.905	
	Hydraulic Boom	hour		2.905	2.905	2.905	
	placer pump						
	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)						
	(i) 16 KL capacity	hour	0.875 x L1 + 2.625				
	(ii) 12 KL capacity	hour		1.167 x L1 + 3.5			
	(iii) 6 KL capacity	hour				2.333 x L1 + 7	
	For formwork and staging add the following:						
14.01H	(i) For cast-in-situ box girder, segmental construction and balanced cantilever, 35- 55 Percent of cost of concrete						
	(p) Height upto 5m						
	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum						
	d) Formwork and staging 35 Percent of (a+b+c)						
	e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
	Cost for 120 cum = a+b+c+d+e+f						
	Rate per cum = (a+b+c+d+e+f)/120						
14.01H	(q) Height 5m to 10m						
(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum						
	d) Formwork and staging 45 Percent of (a+b+c)						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H	(r)	Height above 10m					
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
		d) Formwork and staging 55 Percent of (a+b+c)					
		e) Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		f) Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01	J	PSC Grade M- 65					
		Unit = cum					
		Taking output = 120 cum					
	a)	Material					
		Per Cum Basic Cost	cum	120.000	120.000	120.000	
		(Rate taken from sub-analysis -21.17)					
		Water for curing	Kl	63.000	63.000	63.000	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.263	0.263	0.263	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	4.592	4.592	4.592	
	c)	Machinery					
		Transit truck agitator					
		For transportation	tonne- (6 cum Capacity) , L1 km - lead in Kilometer	300 x L	300 x L	300 x L	
		For unloading	hour	2.905	2.905	2.905	
		Hydraulic Boom placer pump	hour	2.905	2.905	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.875 x L1 + 2.625			
		(ii) 12 KL capacity	hour		1.167 x L1 + 3.5		

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour				2.333 x L1 + 7
		For formwork and staging add the following:					
14.01	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 Percent of cost of concrete					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 35 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H	(q)	Height 5m to 10m					
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 45 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		
		Cost for 120 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/120					
14.01H	(r)	Height above 10m					
	(i)	Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum					
	d)	Formwork and staging 55 Percent of (a+b+c)					
	e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		
	f)	Contractor's profit	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)		

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

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

- Note**
1. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.
 2. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis.

14.02	1600	Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications					
		Unit = MT					
		Taking output = 8 MT					
		a) Material					
		MS bars including 5% overlaps and wastage	tonne	8.400	8.400	8.400	
		Binding wire	Kg	48.000	48.000	48.000	
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.213	0.213	0.213	
		Blacksmith	day	1.330	1.330	1.330	
		Mazdoor	day	3.990	3.990	3.990	
		c) Machinery					
		Cutting Machine	hour	8.000	8.000	8.000	
		Bending Machine	hour	8.000	8.000	8.000	
		Electric generator	hour	8.000	8.000	8.000	
		15 KVA 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 &	hour				
		Unloading Time					
		(i) 18 cum capacity	hour	1.000			
		(ii) 14 cum capacity	hour		1.280		
		(iii) 10 cum capacity	hour			1.778	
		Light weight Crane					
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
14.03	1800	<p>High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications</p> <p>Unit = MT</p> <p>Taking output = 0.377 MT</p> <p>Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)</p> <p>a) Material</p> <p>H.T. Strand @ 9.42 tonne 0.385 0.385 0.385</p> <p>kg/m including 2 Percent for wastage and extra length for jacking</p> <p>Sheathing duct ID metre 42.000 42.000 42.000</p> <p>66 mm along with 5 Percent extra length 40 x 1.05 = 42 m.</p> <p>Tube anchorage set each 2.000 2.000 2.000</p> <p>complete with bearing plate, permanent wedges etc</p> <p>Cement for grouting including 3 Percent wastage @ 3.00 kg/m = 3 x 1.03 x 40 = 123.60 kg (say, = 125 kg)</p> <p>Add 0.50 Percent cost of material for Spacers, Insulation tape and miscellaneous items</p> <p>b) Labour</p> <p>i) For making and fixing cables, anchorages</p> <p>Mate day 0.213 0.213 0.213</p> <p>Blacksmith day 1.330 1.330 1.330</p> <p>Mazdoor day 3.990 3.990 3.990</p>					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		ii) For prestressing					
		Mate/Supervisor	day	0.067	0.067	0.067	
		Prestressing operator / Fitter	day	0.333	0.333	0.333	
		Mazdoor	day	1.330	1.330	1.330	
		iii) For grouting					
		Mate/Supervisor	day	0.067	0.067	0.067	
		Mason	day	0.333	0.333	0.333	
		Mazdoor	day	1.330	1.330	1.330	
		c) Machinery					
		Stressing jack with pump	hour	2.500	2.500	2.500	
		Grouting pump with agitator	hour	1.000	1.000	1.000	
		Generator 33 KVA.	hour	3.500	3.500	3.500	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 0.377 MT (a+b+c+d+e)					
		Rate per MT = (a+b+c+d+e)/0.377					

Note Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.

14.04	2702	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications Unit = 1 cum Taking output = 1 cum					
		a) Material					
		Cement concrete	cum	1.000	1.000	1.000	
		M30 Grade Refer relevant item of concrete in Item 14.01 excluding formwork					
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.075	0.075	0.075	
		b) Labour					
		Mazdoor for cleaning deck slab concrete surface.	day	1.330	1.330	1.330	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d)					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
14.05	516 & 2702	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	0.652	0.652	0.652		
	Mazdoor	day	14.630	14.630	14.630		
	Mazdoor (Skilled)	day	1.663	1.663	1.663		
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						

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(3.35mm to 9.5 mm size) = 40 Percent. Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by 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	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	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	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	0.550	
v)	Pre-coated stone chips of 9.5 mm nominal size for skid resistance = $72.46 \times 0.005 / 10 = 0.036$	cum	0.036	0.036	0.036	0.036	
vi)	Bitumen for coating of chips @ 2 Percent by weight = $0.036 \times 1.456 \times 2/100 = 0.001048$ MT = 1.05kg	kg	1.050	1.050	1.050	1.050	
d)	Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)			
e)	Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)			

Cost for 72.46 sqm = a+b+c+d+e

Rate per sqm = (a+b+c+d+e)/72.46

- Note**
1. The rates for 6 mm or any other thickness may be worked out on pro-rata basis.
 2. Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.
 3. The quantities of binder, filler and aggregates are for estimating purpose. Exact

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

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		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 MoRTH Specifications.		
				a)	Material		
		Cement cum	4.092		4.092		4.092
		concreteM30					
		Grade Refer relevant item of concrete in Item 14.01(C) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c)					
		No. of vertical posts = $(12 + 2)2 = 28$ Nos., External area of vertical post $0.25 \times 0.275 = 0.069\text{sqm}$, Concrete in Vertical posts = $0.069 \times 28 = 1.932$ cum, Hand rail in 3 tiers = $3 \times 24 = 72$ m, External area = $0.170 \times 0.175 = 0.03 \text{ sqm}$, Concrete in hand rails = $0.03 \times 72 = 2.16$ cum, Total Concrete = $1.932 + 2.16 = 4.092$ cum.					
		Add 5 Percent of					

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

above cost for form
work for casting in
casting yard.

HYSD bar tonne 0.865 0.865 0.865

reinforcement Rate
as per item No
14.02(Excluding OH
& CP)

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

Rate for 48 m (a+b+c)

Rate per metre (a+b+c)/48

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

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

— () — () — () — () — () —

Note

- Quantities of material have been adopted from standard plans of MORIH vide drawing no. SD/202.
- 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 = 2×24 m

span = 48 m.

a) Material

Cement cum 4.092 4.09
concreteM30

Grade Refer
relevant item of
concrete in Item
14.01(C) by using
batching plant,
excluding
formwork i.e. per
cum basic cost
($a+b+c$)

$$\text{No. of vertical posts} = (12 + 2)2 = 28 \text{ Nos., External}$$

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		area of vertical post $0.25 \times 0.275 = 0.069 \text{ sqm}$, Concrete in vehicle posts $= 0.069 \times 28 = 1.932 \text{ cum}$, Hand rail in 3 tiers $= 3 \times 24 = 72 \text{ m}$, External area $= 0.170 \times 0.175 = 0.03 \text{ sqm}$, Concrete in hand rails $= 0.03 \times 72 = 2.16 \text{ cum}$, Total Concrete $= 1.932 + 2.16 = 4.092 \text{ cum}$. Add 12 Percent of above cost for form work.					
		HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.865	0.865	0.865	
	b) Overhead charges			@ on (a)	@ on (a)	@ on (a)	
	c) Contractor's profit			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	Rate for 48 m (a+b+c)						
	Rate per metre (a+b+c)/48						

Note 1. Quantities of material have been calculated as per above assumption.
2. 48 m length is the total linear length adding both sides of 24 m span.

14.08	2703.2 & 1900	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification Unit = 1 RM Taking output = 2 x 50 m span = 100 m a) Material: 1) ISMC 100 = 2.806 tonne $\times 1.05 = 2.946 \text{ MT}$ 2) MS Flat = $0.964 \times 1.05 = 1.012 \text{ MT}$ 3) MS bars = $0.17 \times 1.05 = 0.180 \text{ MT}$ 4) MS bolts, nuts and washers Add @ 5 Percent of cost of material for painting one shop coat with red oxide primer and three coats of synthetic				
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		enamel paint and consumables to safeguard against weathering and corrosion.					
		Add for cost of concrete for fixing vertical posts in the performed recess @ 1 Percent of cost of material.					
		Add for electricity charges, welding and drilling equipment, electrodes and other consumables @ 1 Percent of cost of material.					
	b)	Labour					
		Mate	day	3.724	3.724	3.724	
		Mazdoor (Skilled)	day	39.900	39.900	39.900	
		Mazdoor	day	53.200	53.200	53.200	
	c)	Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)		
	d)	Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 100 m steel railing = a+b+c+d					
		Rate per metre (a+b+c+d)/100					
14.09	2705	Drainage Spouts complete as per drawing and Technical specification Unit = 1 No. Taking output = 1 No.					
		a) Material					
		Corrosion resistant Structural steel including 5 Percent wastage	Kg	4.000	4.000	4.000	
		GI pipe 100mm dia	metre	6.000	6.000	6.000	
		GI bolt 10 mm Dia	each	6.000	6.000	6.000	
		Galvanised MS flat clamp	each	2.000	2.000	2.000	
	b)	Labour					
		For fabrication					
		Mate	day	0.002	0.002	0.002	
		Skilled (Blacksmith, welder etc.)	day	0.027	0.027	0.027	
		Mazdoor	day	0.027	0.027	0.027	
		For fixing in position					
		Mate	day	0.011	0.011	0.011	
		Mason	day	0.013	0.013	0.013	
		Mazdoor	day	0.266	0.266	0.266	

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

Add @ 5 Percent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.			
c)	Overhead charges	@ on (a+b)	@ on (a+b)
d)	Contractor's profit	@ on (a+b+c)	@ on (a+b+c)
Rate per metre (a+b+c+d)			

- Note**
1. In case of viaducts in urban areas, the drainage spouts should be connected with suitably located pipelines to discharge the surface run-off to drains provided at ground level.
 2. In case of bridges, sufficient length of G.I Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.

14.10	2700	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	Unit = 1 cum	Taking output = 1 cum	Material		
		Case I PCC Grade M15 using batching plant & Concrete pump					
		Concrete, Rate as per item No. 12.08 (A) excluding formworks		cum	1.000		
		Concrete, Rate as per item No. 12.08 (A) excluding formworks				1.000	
		Concrete, Rate as per item No. 12.08 (A) excluding formworks					1.000
		Rate per cum					
		Case II PCC Grade M15 using batching plant & manual placing					
		Concrete, Rate as per item No. 12.08 (A) excluding formworks		cum	1.000		
		Concrete, Rate as per item No. 12.08 (A) excluding formworks				1.000	
		Concrete, Rate as per item No. 12.08 (A) excluding formworks					1.000

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

		item No. 12.08 (A) excluding formworks Rate per cum					
14.11	1500,16 00,1700 & 2704	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification <i>Unit = 1 cum</i> <i>Taking output = 1 cum</i>					
		a) Material					
		Cement cum 1.000 1.000 1.000					
		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. 13.08 (G) except that form work may be added at the rate of 2 Percent of cost against 3.5 Percent provided in the foundation concrete.					
		HYSD bar tonne 0.050 0.050 0.050					
		reinforcement Rate as per item No 14.02(Excluding OH & CP)					
		b) Overhead charges @ on (a) @ on (a) @ on (a)					
		c) Contractor's profit @ on (a+b) @ on (a+b) @ on (a+b)					
		Rate per cum (a+b+c)					

Note	The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.
14.12	1600 Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) Unit = MT Taking output = 1 MT

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		To be taken as per the prevailing market rates.					
		Note					
		Contractors generally do not have expertise for this item. The job is therefore, got done from specialized firms who have the expertise in the field of construction chemicals. The prevailing rate in the market is required to be ascertained from the market and added in the cost estimate. HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) as per MoRTH circular /specification.					
14.13	1800 & 2300	Precast - pretensioned Girders					
		Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications					
		Unit = cum					
		Taking output = 1 cum					
		Grade of concrete - M40					
		a) Material					
		Per Cum Basic Cost (Rate as in sub-analysis)	cum	1.000	1.000	1.000	
		Water for curing	KI	0.525	0.525	0.525	
		HYSD steel.	tonne	0.100	0.100	0.100	
		HT strand with 5	tonne	0.060	0.060	0.060	
		Percent as wastage and extra length for anchoring					
		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					
		Taking quantity of steel					
		100 Kg/cum of concrete					
		including laps and wastage					
		Mate	day	0.093	0.093	0.093	
		Mazdoor (Skilled)	day	0.466	0.466	0.466	
		Mazdoor	day	1.862	1.862	1.862	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc., prestressing and cutting of extra length of HT strand after de-stressing.					
		<i>Taking quantity of HT strand 60 Kg/cum</i>					
		Mate	day	0.027	0.027	0.027	
		Mazdoor (Skilled)	day	0.186	0.186	0.186	
		Mazdoor	day	0.500	0.500	0.500	
		(iii) Erection and dismantling of shuttering					
		<i>Taking shuttering area 10 sqm/cum of concrete</i>					
		Mate	day	0.120	0.120	0.120	
		Mazdoor (Skilled)	day	1.000	1.000	1.000	
		Mazdoor	day	2.000	2.000	2.000	
		(iv) Concreting by Batching plant and stationary concrete pump					
		Mate	day	0.026	0.026	0.026	
		Mazdoor (Skilled)	day	0.050	0.050	0.050	
		Mazdoor	day	0.600	0.600	0.600	
		(v) Steam curing and manual curing					
		Mate	day	0.014	0.014	0.014	
		Mazdoor	day	0.350	0.350	0.350	
		(vi) Handling of precast girder, stacking in stockyard and again loading in trailer					
		Mate	day	0.010	0.010	0.010	
		Mazdoor	day	0.250	0.250	0.250	
		(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.					
		Mate	day	0.012	0.012	0.012	
		Mazdoor (Skilled)	day	0.060	0.060	0.060	
		Mazdoor	day	0.240	0.240	0.240	
c)		Machinery					
i)		At casting yard					
		Transit truck agitator					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		For transportation (6 cum Capacity), L1 - lead in Kilometer	tonne-km	2.5 x L1	2.5 x L1	2.5 x L1	
		For unloading Hydraulic Boom placer pump	hour	0.024	0.024	0.024	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	0.024	0.024	0.024	
		(i) 16 KL capacity	hour	0.007 x L1 + 0.022			
		(ii) 12 KL capacity	hour		0.01 x L1 + 0.029		
		(iii) 6 KL capacity	hour			0.019 x L1 + 0.058	
		Crane 35 tonne capacity	hour	0.100	0.100	0.100	
		Trailer 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.	tonne-km	2.5xL1	2.5xL1	2.5xL1	
		(L1 - Lead in Kilometer)					
		Trailer 30 tonne capacity during placement.	hour	0.150	1.150	2.150	
		Cost of formwork, steam curing arrangement, pretensioning arrangement etc @ 5 Percent of cost material, labour and machinery					
	d)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum = (a+b+c+d+e)					
14.14	1700 & 1800	Providing and fixing Helical pipes in voided concrete slabs					
		Unit = RM					
		Taking output = 1 RM					
	a)	Material					
		Helical pipes 600mm diameter	metre	1.000	1.000	1.000	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Tie rods 20mm diameter	each	1.000	1.000	1.000	
		Consumables for sealing joints etc. @ 5 Percent of cost of material					
	b)	Labour					
		Mate	day	0.010	0.010	0.010	
		Fitter	day	0.050	0.050	0.050	
		Mazdoor	day	0.200	0.200	0.200	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum (a+b+c+d)					

14.15 800 **Crash Barriers for Bridge**
 Provision of an Reinforced cement concrete crash barrier at the bridge decks & approaches to bridge structures, constructed with Reinforced Cement Concrete with HYSD reinforcement conforming MoRT&H Specification and as per details given IRC -5 including dowel bars , expansion joints filled with pre-moulded asphalt filler board etc. and approved drawing and at locations directed by the Engineer, all as specified.
Unit = Linear metre
Taking output = 10 m

A	Crash Barriers for Bridge (Height 950 mm) as per details given IRC -5 (fig.- 1) (Area-0.254 Sqm. for 1 meter length)					
a)	M40 grade concrete & HYSD steel reinforcement					
	M 40 grade concrete (Area- 0.254 Sqm. /Meter) (Rate taken from item No. 14.01 E (p) including OH & CP)	cum	2.540	2.540	2.540	
	HYSD steel	tonne	0.229	0.229	0.229	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		reinforcement including dowel bars(Rate taken from item No. 14.02 including OH & CP)					
	b)	Labour					
		Mate	day	0.040	0.040	0.040	
		Mazdoor	day	1.000	1.000	1.000	
	c)	Material					
		Pre-moulded asphalt filler board	sqm	0.265	0.265	0.265	
	d)	Overhead charges		@ on (b+c)	@ on (b+c)	@ on (b+c)	
	e)	Contractor's profit		@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	
		Cost for 10 metre = a+b+c+d+e					
		Rate per metre = (a+b+c+d+e)/10					
14.15	B	Crash Barriers for Bridge (Height 1100 mm) as per details given IRC -5 (fig.-2) (Area-0.298 Sqm. for 1 meter length)					
	a)	M40 grade concrete & HYSD steel reinforcement					
		M 40 grade concrete (Area-0.298 Sqm. /Meter) (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					
14.15	C	Crash Barriers for Bridge (Height 1550 mm) as per details given IRC -5 (fig.-3) (Surface Area- 0.514 Sqm. for 1 meter length)					
	a)	M40 grade concrete & HYSD steel					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		reinforcement					
		M 40 grade concrete (Area-0.514 Sqm. /Meter) (Rate taken from item No. 14.01 E (p) including OH & CP)	cum	5.140	5.140	5.140	
		HYSD steel reinforcement including dowel bars (Rate taken from item No. 14.02 including OH & CP)	tonne	0.463	0.463	0.463	
	b) Labour						
		Mate	day	0.080	0.080	0.080	
		Mazdoor	day	1.995	1.995	1.995	
	c) Material						
		Pre-moulded asphalt filler board	sqm	0.540	0.540	0.540	
	d) Overhead charges			@ on (b+c)	@ on (b+c)	@ on (b+c)	
	e) Contractor's profit			@ on (b+c+d)	@ on (b+c+d)	@ on (b+c+d)	

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

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

Note:- The rate analysis for semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.

14.16	800	Painting on concrete surface					
		Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 sqm.					
		Unit = sqm					
		Taking output = 10 sqm					
	a) Labour						
		Mate	day	0.020	0.020	0.020	
		Painter	day	0.250	0.250	0.250	
		Mazdoor (Skilled)	day	0.250	0.250	0.250	
	b) Material						
		Water based paint of approved quality for cement concrete surface	Litres	5.000	5.000	5.000	
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cost for 10 sqm (a+b+c+d) Rate per sqm (a+b+c+d)/10					
14.17	2604	Filler joint (i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification. Unit = Running meter Taking output = 12 m a) Labour Cutting, bending, carrying & fixing etc. Mate day 0.040 0.040 0.040 Mazdoor day 0.500 0.500 0.500 Mazdoor (Skilled) day 0.500 0.500 0.500 b) Material Copper plate - 12m long x 250 mm wide Area = 12 x 0.25 = 3 sqm Weight = 3 x 0.002 x 8900 = 53.4 kg Wastage @ 2.5 Percent = 1.33 kg/54.73 kg say = 55 kg. c) Overhead charges d) Contractor's profit		@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ 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 Mazdoor (Skilled) day 0.100 0.100 0.100 b) Material 20 mm thick compressible fibre board 12 m long x 25 cm deep. Area = 12 x 0.25 = 3 sqm c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
				@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		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 premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications. Unit = Running meter Taking output = 12 m					
	a)	Labour					
		Mate	day	0.012	0.012	0.012	
		Mazdoor	day	0.200	0.200	0.200	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
	b)	Material					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.600	3.600	3.600	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d) Rate per m = (a+b+c+d)/12					
14.17	(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 Percent bitumen by weight Unit = Running meter Taking output = 12 m 12m long x 100 mm wide x 10mm deep recess					
	a)	Labour					
		Mate	day	0.024	0.024	0.024	
		Mazdoor	day	0.500	0.500	0.500	
		Mazdoor (Skilled)	day	0.100	0.100	0.100	
	b)	Material					
		Sand	cum	0.012	0.012	0.012	
		Volume 12 x 0.1 x 0.01 = 0.012 cum					
		Weight 0.012 x 1400 = 16.8kg					

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

Bitumen cum 0.001 0.001 0.001
 $16.8 \times 0.06 = 1 \text{ kg}$
c) Overhead charges @ on (a+b) @ on (a+b) @ on (a+b)
d) Contractor's profit @ on @ on (a+b+c) @ on (a+b+c)
(a+b+c)
 Cost for 12 m = (a+b+c+d)
Rate per m = (a+b+c+d)/12

Note For arriving at the final rate of filler joints per m length and per cm depth of joint filling compound, the rates at Sl. No. i), ii), iii) & iv) shall be added

- 14.18 2600 Asphaltic Plug joint**
 Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of weldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/ backer rod, all as per approved drawings and specifications.

Unit = Running meter

Taking output = 12 m

a) Labour					
Mate	day	0.052	0.052	0.052	
Mazdoor	day	1.000	1.000	1.000	
Mazdoor (Skilled)	day	0.300	0.300	0.300	
b) Material					
Crushed stone aggregate 12.5 mm nominal size	cum	0.750	0.750	0.750	
Polymer modified bitumen	kg	77.500	77.500	77.500	
Galvanised structural steel plate 200 mm wide, 6 mm thick, 12 m long (2.4 sqm) @ 47.10	kg	113.000	113.000	113.000	

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

kg/sqm including 5 Percent wastage Add 1 Percent for welding and foam caulking/backer rod and other incidentals.					
c) Machinery					
Mastic cooker 1 tonne capacity					
Mastic cooker 1	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) (a+b+c)					

Cost for 12 m asphalt plug joint = (a+b+c+d+e)

Rate per m = (a+b+c+d+e)/12

Note The nominal size of aggregates shall be 12.5 mm for depth of joint upto 75 mm and 20 mm for joints of depth more than 75 mm.

14.19 2605 Elastomeric Slab Steel Expansion Joint
 Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation and clause 2605 of MoRTH specifications for road & bridge works.

Unit = Running meter

Taking output = 12 m

a) Labour

Mate	day	0.060	0.060	0.060
Mazdoor	day	1.000	1.000	1.000
Mazdoor (Skilled)	day	0.500	0.500	0.500

b) Material

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)		
				Large	Medium	Small			
		Supply of elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II), complete as per approved drawings and standard specification conforming to clause 2605 of MoRT&H Specification Add 5 Percent of cost of material for anchorage reinforcement, welding and other incidentals.	metre	12.000	12.000	12.000			
c)	Overhead charges	@ on (a+b)		@ on (a+b)	@ on (a+b)				
d)	Contractor's profit	@ on (a+b+c)		@ on (a+b+c)	@ on (a+b+c)				
Cost for 12 m = (a+b+c+d)				(a+b+c)					
Rate per m = (a+b+c+d)/12									

14.20 2608

Compression Seal Joint

Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm.

Unit = Running meter

Taking output = 12 m

a) Labour

Mate	day	0.036	0.036	0.036
Mazdoor	day	0.600	0.600	0.600
Mazdoor (Skilled)	day	0.300	0.300	0.300

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
b)	Material						
	1. Galvanised angle sections 100mm x 100mm of 12mm thickness weldable structural steel as per IS: 2062, 2 nos. of 12 m length each @ 17.7 kg/m and 5 Percent wastage. Add 5 Percent of cost of above for structural steel for anchorage, welding and other incidentals.	kg	446.000	446.000	446.000		
	Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness. Add 1 Percent of cost of sealing element for lubricant-cum-adhesive and other consumables.	metre	12.000	12.000	12.000		
c)	Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)			
d)	Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)			
Cost for 12 m = (a+b+c+d) Rate per m = (a+b+c+d)/12							

- Note**
1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.
 2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.
 3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.

14.21 2607

Strip Seal Expansion

Joint

Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be

CHAPTER: 14- SUPER-STRUCTURE

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

installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Unit = Running meter

Taking output = 12 m

a) Labour

Mate	day	0.050	0.050	0.050
Mazdoor	day	1.000	1.000	1.000
Mazdoor (Skilled)	day	0.250	0.250	0.250

b) Material

Supply of complete assembly of strip seal expansion joint comprising of edge beams, anchorage, strip seal element and complete accessories as per approved specifications and drawings.	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

- Note**
1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.
 2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.

14.22 2600

Modular Strip / Box Seal

Joint

Providing and laying of a modular strip Box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, complete as per approved drawings and standard specifications to

CHAPTER: 14- SUPER-STRUCTURE

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

be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Unit = Running meter

Taking output = 12 m

a) Labour

Mate	day	0.056	0.056	0.056
Mazdoor	day	1.000	1.000	1.000
Mazdoor (Skilled)	day	0.400	0.400	0.400

b) Material

Supply of a modular strip/box seal joint assembly	metre	12.000	12.000	12.000
---	-------	--------	--------	--------

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.

c) Overhead charges

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

d) Contractor's profit

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

Cost for 12 m Modular strip/box seal joint = (a+b+c+d)

Rate per m = (a+b+c+d)/12

- Note**
1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.
 2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.
 3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.

14.23 2600

Modular Strip / Box Seal

Joint

Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, complete as per approved drawings and standard specifications

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation. Unit = Running meter Taking output = 12 m					
a)	Labour						
	Mate	day	0.077	0.077	0.077		
	Mazdoor	day	1.250	1.250	1.250		
	Mazdoor (Skilled)	day	0.665	0.665	0.665		
b)	Material						
	Supply of a modular box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.000	12.000	12.000		
c)	Overhead charges	@ on (a+b)	@ on (a+b)	@ on (a+b)			
d)	Contractor's profit	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)			
Cost for 12 m Modular strip/box seal joint = (a+b+c+d)							
Rate per m = (a+b+c+d)/12							

- Note**
1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.
 2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.
 3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.

14.24

Painting with synthetic enamel paint bridge No. and span arrangements

Painting two coats after filling the surface with synthetic enamel paint bridge No. and span arrangements as per as directed by Engineer.

Unit = Nos.

Taking output = 1 Nos.

CHAPTER: 14- SUPER-STRUCTURE

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Labour						
	Mate	day	0.008	0.008	0.008		
	Painter	day	0.133	0.133	0.133		
	Mazdoor	day	0.067	0.067	0.067		
b)	Material						
	Paint conforming to requirement of clause 803.3.	Litre	0.300	0.300	0.300		
	Add for scaffolding @ 1 Percent of labour cost where required						
	Add @ 5 Percent cost of labour and materials to prepare the surface by filling minute roughness on the surface and priming the surface before laying 2 coats of painting.						
c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)		
d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
Rate per Nos. = (a+b+c+d)							

14.25 Suggestive

Bipolar corrosion inhibiting admixture in concrete for protection of reinforced steel from corrosion

Admix polydentate, bipolar, migratory, integral, non nitrite base concrete penetrating corrosion inhibiting admixture at a dosage of 3 Kg per cu.m. Of concrete as per manufacturers specification. Inhibitor should conform to following

- ASTM G-109-2005- Long term corrosion test resulting in a corrosion rate of zero coulombs.
- JIS Z 1535- Accelerated corrosion test showing significant reduction in corrosion using the admixture.
- ASTM G1- Immersion test for 720 hrs indicating rebar weight loss less

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

than 5 mpy
iv. ASTM G3- Polarization test by Tafel test indicating Rebar weight loss of less than 5 mpy

Unit = Cum.

Taking output = 100.00 Cum

a) Material

Corrosion Inhibiting Admixture @ 3 kg per cubic Meter	Kg.	300.000	300.000	300.000
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b) Overhead charges

@ on (a)

c) Contractor's profit

@ on (a+b)

@ on (a+b)

Cost for 100 cum. = a+b+c

Rate per cum = (a+b+c)/100

14.26	1700	Providing structural steel for super-structure complete as per drawing and technical specifications					
		Unit = MT					
		Taking output = 17.135 MT					
		a) Material					
		Structural steel in plates, angles, etc including 5 Percent wastage	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	28.058	28.058	28.058	
		Fitter	day	102.553	102.553	102.553	
		Blacksmith	day	102.553	102.553	102.553	
		Welder	day	102.553	102.553	102.553	
		Painter I class	day	43.072	43.072	43.072	
		Mazdoor	day	350.731	350.731	350.731	
		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					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Loading & Unloading @ 1 hr for each operation)					
		Crane 35 tonne capacity (For Lifting and Placing in Position @ 2 hrs)	Hrs	4.000	4.000	4.000	
		Trailer 30 tonne capacity for transporting to site.	Hrs	4+L/15	4+L/15	4+L/15	
		Applying 2 coats primer before painting of Truss and Girder (42 sqm/tonne)	Lit	899.588	899.588	899.588	
		Painting of Truss and Girder	Lit	899.588	899.588	899.588	
		Sundries @ 5% of the above (a,b & c)					
d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		

Cost for 17.135 MT (a+b+c+d+e)

Rate for per MT (a+b+c+d+e)/17.135

CHAPTER – 15
BOX CELL STRUCTURES

PREAMBLES:

- 1 Excavation for structures has been provided both by manual and mechanical means. The rate relevant to a particular situation may be adopted.
- 2 The earth excavated from foundation has been proposed to be backfilled and balance quality utilized for road work locally except for marshy soil where disposal has been provided.
- 3 The rock foundations are required to be prepared which has been analysed.
- 4 In case of rocks, excavation has been considered upto a depth of 3 m only.
- 5 Embedment of foundation in soft and hard rocks has been provided as required by the specifications.
- 6 Mixing of cement concrete has been considered by using batching plant.
- 7 Concrete batching plant is generally placed within one km of the Box Cell site. In case of longer lead, transportation cost may be worked out based on tonne Km
- 8 The coarse and fine aggregate for cement concrete shall be as per IS: 383.
- 9 Description of items has been given very brief. Relevant clauses of MoRT&H Specifications may be referred for detailed specification.
- 10 Filter media and backfilling behind abutments are required to be provided as per guidelines given in IRC: 78.
- 11 Weep holes shall be provided as per Clause 2706 of MoRT&H Specifications.

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

15.01 304 Excavation for Structures

Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.

I **Ordinary soil**

Unit = cum

Taking output = 10 cum

A Manual Means

(i) **Depth upto 3 m**

a) **Labour**

Mate	day	0.186	0.186	0.186
Mazdoor	day	4.655	4.655	4.655

b) **Overhead charges**

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

c) **Contractor's profit**

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

Cost for 10 cum = a+b+c

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

- Note**
1. Cost of dewatering may be added where required upto, 10 Percent of labour cost Assessment for dewatering shall be made as per site conditions.
 2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 15.01 excluding marshy soil.
 3. The cost of shoring and shuttering, where needed, may be added @ 1 Percent on cost of excavation for open foundation.

15.01 A (ii) Depth 3 m to 6 m

a) **Labour**

Mate/Supervisor	day	0.239	0.239	0.239
Mazdoor	day	5.985	5.985	5.985

b) **Overhead charges**

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

c) **Contractor's profit**

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

Cost for 10 cum = a+b+c

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

- Note** Cost of dewatering may be added where required upto 15 Percent of labour cost. Assessment for dewatering shall be done as per actual ground conditions.

15.01 A (iii) Depth above 6 m

a) **Labour**

Mate/Supervisor	day	0.319	0.319	0.319
Mazdoor	day	7.980	7.980	7.980

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

b) Overhead charges @ on (a)
 c) Contractor's profit @ on (a+b) @ on (a+b) @ on (a+b)
 Cost for 10 cum = a+b+c
 Rate per cum = (a+b+c)/10

Note 1. Cost of dewatering may be added where required upto 20 Percent of labour cost.
 Assessment for dewatering shall be made as per site conditions.

15.01 B (i) Mechanical Means (Depth upto 3 m)

Unit = cum

Taking output = 330 cum

a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor	day	10.640	10.640	10.640

b) Machinery

Hydraulic Excavator

For excavation

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

For backfilling

(considering 60% of the excavated material)

(i) 1.2 cum bucket capacity	hour	3.305
(ii) 1.1 cum bucket capacity	hour	3.806
(iii) 0.9 cum bucket capacity	hour	5.321

Tipper for transportation

of excess material to dumping yard considering lead @ 1 km

(i) 14 cum capacity	t-km	198.000
(ii) 14 cum capacity	t-km	198.000
(iii) 10 cum capacity	t-km	198.000

c) Overhead charges @ on (a+b)

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

Cost for 330 cum = a+b+c+d

Rate per cum = (a+b+c+d)/ 330

CHAPTER: 15- BOX CELL STRUCTURES

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

15.01	B	(ii) Mechanical Means (Depth 3 m to 6 m)					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					
		(i) 1.2 cum bucket capacity	hour	5.564			
		(ii) 1.1 cum bucket capacity	hour		6.408		
		(iii) 0.9 cum bucket capacity	hour			8.958	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.338			
		(ii) 1.1 cum bucket capacity	hour		3.845		
		(iii) 0.9 cum bucket capacity	hour			5.375	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 14 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 300 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/300					

15.01	B	(iii) Mechanical Means (Depth above 6 m)					
		Unit = cum					
		Taking output = 270 cum					
		a) Labour					
		Mate	day	0.426	0.426	0.426	
		Mazdoor	day	10.640	10.640	10.640	
		b) Machinery					
		Hydraulic Excavator					
		For excavation					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	5.634			
		(ii) 1.1 cum bucket capacity	hour		6.488		
		(iii) 0.9 cum bucket capacity	hour			9.070	
		For backfilling (considering 60% of the excavated material)					
		(i) 1.2 cum bucket capacity	hour	3.380			
		(ii) 1.1 cum bucket capacity	hour		3.893		
		(iii) 0.9 cum bucket capacity	hour			5.442	
		Tipper for transportation of excess material to dumping yard considering lead @ 1 km					
		(i) 14 cum capacity	t-km	162.000			
		(ii) 14 cum capacity	t-km		162.000		
		(iii) 10 cum capacity	t-km			162.000	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

Cost for 270 cum = a+b+c+d

Rate per cum = (a+b+c+d)/ 270

15.01	II	Ordinary Rock (not requiring blasting)					
	A	Manual Means					
	(i)	Depth upto 3 m					
		Unit = cum					
		Taking output = 10 cum					
	a)	Labour					
		Mate	day	0.266	0.266	0.266	
		Mazdoor	day	6.650	6.650	6.650	
	b)	Overhead charges @ on (a)					
	c)	Contractor's profit @ on (a+b)					
		Cost for 10 cum = a+b+c					
		Rate per cum = (a+b+c)/10					

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

CHAPTER: 15- BOX CELL STRUCTURES

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

15.01

B Mechanical Means

Unit = cum

Taking output = 50 cum

a) Labour

Mate	day	0.160	0.160	0.160
Mazdoor	day	3.990	3.990	3.990

b) Machinery

Hydraulic Excavator

Excavator for excavation

(i) 1.2 cum bucket capacity	hour	6.926	
(ii) 1.1 cum bucket capacity	hour		8.149
(iii) 0.9 cum bucket capacity	hour		8.658

For loading

(i) 1.2 cum bucket capacity	hour	1.039	
(ii) 1.1 cum bucket capacity	hour		1.196
(iii) 0.9 cum bucket capacity	hour		1.672

Jack Hammer

Tipper

For transportation

considering lead @ 1km			
(i) 14 cum capacity	t-km	75.000	
(ii) 14 cum capacity	t-km		75.000
(iii) 10 cum capacity	t-km		75.000

For loading & unloading time

(i) 14 cum capacity	hour	1.039	
(ii) 14 cum capacity	hour		1.196
(iii) 10 cum capacity	hour		1.672

c) Overhead charges

d) Contractor's profit

@ on (a+b)	@ on (a+b)	@ on (a+b)
@ 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	0.459	0.459	0.459
Driller	day	0.500	0.500	0.500
Blaster	day	0.333	0.333	0.333
Mazdoor	day	10.640	10.640	10.640

CHAPTER: 15- BOX CELL STRUCTURES

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

b) Machinery	Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.000	1.000	1.000
c) Material	Explosives (Blasting Material)	kg	3.500	3.500	3.500
	Detonator electric	each	14.000	14.000	14.000
d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

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

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

Note Cost of dewatering @ 10 Percent of (a+b) may be added, where required Assessment for dewatering shall be made as per site conditions.

**15.01 302 &
303**

**III Hard Rock (requiring
blasting)**

Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303

B Mechanical Means

Unit = cum

Taking output = 120 cum

a) Labour

Mate	day	0.253	0.253	0.253
Mazdoor	day	3.990	3.990	3.990
Driller	day	2.000	2.000	2.000
Blaster	day	0.333	0.333	0.333

b) Machinery

Air compressor	hour	6.000	6.000	6.000
Jack Hammer for drilling holes (@ 4.5 m per hour)	hour	24.000	24.000	24.000
Jack Hammer (consider 5% of the volume for dressing)	hour	1.219	1.219	1.219

Hydraulic Excavator

Excavator for
excavation

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 1.2 cum bucket capacity	hour	1.219			
		(ii) 1.1 cum bucket capacity	hour		1.219		
		(iii) 0.9 cum bucket capacity	hour			1.219	
		For loading					
		(i) 1.2 cum bucket capacity	hour	2.493			
		(ii) 1.1 cum bucket capacity	hour		2.871		
		(iii) 0.9 cum bucket capacity	hour			4.013	
		Tipper					
		For transportation considering lead @ 1 km					
		(i) 14 cum capacity	t-km	180.000			
		(ii) 14 cum capacity	t-km		180.000		
		(iii) 10 cum capacity	t-km			180.000	
		For loading & unloading time					
		(i) 14 cum capacity	hour	2.493			
		(ii) 14 cum capacity	hour		2.871		
		(iii) 10 cum capacity	hour			4.013	
c)	Materials						
		Small dia.Explosive at 0.40 kg / cum for 120 cum (120 x 0.40)	kg	48.000	48.000	48.000	
		Explosive at 0.20 kg / cum for secondary blast @ 5%of the total volume (120 x 0.2x5%)					
		Electric detonators at 1 per hole for main blast holes (21x3+20*2)=103 nos	no	69.000	69.000	69.000	
		Ordinary detonators @ 1 per hole for 10 secondary holes (required for 5% of the total quantity @ 0.6 m per hole for 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+

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

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	IV	Hard Rock (blasting prohibited) Unit = cum Taking output = 35 cum					
	A	Mechanical Means					
	a)	Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
	b)	Machinery					
		Jack Hammer	hour	7.111	8.889	10.940	
		Hydraulic Excavator					
		Excavator for excavation					
		(i) 1.2 cum bucket capacity	hour	7.111			
		(ii) 1.1 cum bucket capacity	hour		8.889		
		(iii) 0.9 cum bucket capacity	hour			10.940	
		For loading					
		(i) 1.2 cum bucket capacity	hour	0.727			
		(ii) 1.1 cum bucket capacity	hour		0.837		
		(iii) 0.9 cum bucket capacity	hour			1.171	
		Tipper					
		For transportation to dumping yard considering lead @ 1km					
		(i) 14 cum capacity	t-km	52.500			
		(ii) 14 cum capacity	t-km		52.500		
		(iii) 10 cum capacity	t-km			52.500	
		For loading & unloading time					
		(i) 14 cum capacity	hour	0.727			
		(ii) 14 cum capacity	hour		0.837		
		(iii) 10 cum capacity	hour			1.171	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 35 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/35					
15.01	V	Marshy Soil Unit = cum Taking output = 10 cum Depth upto 3 m					
	A	Manual means					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Labour						
	Mate/Supervisor		day	0.532	0.532	0.532	
	Mazdoor		day	13.300	13.300	13.300	
b)	Machinery						
	Tractor-trolley for removal.		hour	2.670	2.670	2.670	
c)	Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
d)	Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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

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

- Note**
1. Cost of dewatering @ 30 Percent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.
 2. Shoring & strutting 15 Percent of (a), where required may be added
 3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item15.01 (i) to (iv) for ordinary soil

15.01

B Mechanical Means

Unit = cum

Taking output = 260 cum

a) Labour

Mate	day	0.053	0.053	0.053
Mazdoor	day	1.330	1.330	1.330

b) Machinery

Hydraulic Excavator

(i) 1.2 cum bucket capacity	hour	10.126	
(ii) 1.1 cum bucket capacity	hour		11.662
(iii) 0.9 cum bucket capacity	hour		16.304

Tipper

For transportation to dumping yard considering lead @ 1km

(i) 14 cum capacity	t-km	390.000	
(ii) 14 cum capacity	t-km		390.000
(iii) 10 cum capacity	t-km		390.000

For loading & unloading time

(i) 14 cum capacity	hour	10.126	
(ii) 14 cum capacity	hour		11.662
(iii) 10 cum capacity	hour		16.304

c) Material

Selected earth for refilling	cum	156.000	156.000	156.000
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d) Overhead charges

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

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

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

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.01	VI	Back Filling in Marshy Foundation Pits Unit = Cum Taking Output = 6 cum					
		a) Labour		Mate day 0.160	0.160	0.160	
				Mazdoor for dressing sides, bottom and backfilling day 3.990	3.990	3.990	
		b) Machinery		Tractor-trolley for transportation hour 2.000	2.000	2.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 6 cum = a+b+c+d					
		Rate per cum = (a+b+c+d)/6					
15.02	304	Filling Annular Space Around Footing in Rock Unit = cum Taking out put = 1 cum PCC-15 nominal mix. Rate may be taken as per item 15.11.					
15.03	304	Sand Filling in Foundation Trenches as per Drawing & Technical Specification Unit = cum Taking output = 100 cum					
		a) Labour		Mate day 0.053	0.053	0.053	
				Mazdoor day 1.330	1.330	1.330	
		b) Machinery		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)			
			(i) 16 KL capacity	hour 0.125 x L1 + 0.750			
			(ii) 12 KL capacity	hour	0.167 x L1 + 1.000		
			(iii) 6 KL capacity	hour		0.333 x L1 + 2.000	
		c) Material		Sand (assuming 20 Percent voids) at site cum 120.000	120.000	120.000	
			Water	KL 18.000	18.000	18.000	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per 100 cum = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/100					
15.04	1300	Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications. Unit = cum Taking output = 5 cum					
		a) Material					
		Bricks 1st class	each	2500.000	2500.000	2500.000	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	1.200	1.200	1.200	
		Water for curing	KL	2.415	2.415	2.415	
		b) Labour					
		Mate	day	0.638	0.638	0.638	
		Mason	day	5.320	5.320	5.320	
		Mazdoor	day	10.640	10.640	10.640	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.017 x L1 + 0.101			
		(ii) 12 KL capacity	hour		0.022x L1 + 0.134		
		(iii) 6 KL capacity	hour			0.045 x L1 + 0.268	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					
15.05	Sub-analysis	(A) Cement Mortar 1:3 (1 cement : 3 sand) Unit = cum Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.510	0.510	0.510	
		Sand	cum	1.050	1.050	1.050	
		b) Labour					
		Mate	day	0.048	0.048	0.048	

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	1.197	1.197	1.197	
Total Material and Labour = (a+b)							
	Sub-analysis (Addl.)	(B) Cement Mortar1:2 (1 cement :2 sand)					
		Unit = cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.672	0.672	0.672	
		Sand	cum	0.930	0.930	0.930	
		b) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	1.197	1.197	1.197	
Total Material and Labour = (a+b)							
	Sub-analysis (Addl.)	(C) Cement Mortar1:4 (1 cement :4 sand)					
		Unit = cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.403	0.403	0.403	
		Sand	cum	1.120	1.120	1.120	
		b) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	1.197	1.197	1.197	
Total Material and Labour = (a+b)							
	Sub-analysis (Addl.)	(D) Cement Mortar1:6 (1 cement :6 sand)					
		Unit = cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.288	0.288	0.288	
		Sand	cum	1.337	1.337	1.337	
		b) Labour					
		Mate	day	0.048	0.048	0.048	
		Mazdoor	day	1.197	1.197	1.197	
Total Material and Labour = (a+b)							
15.06	1400	Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications.					
		Unit = cum					
		Taking output = 5 cum					
1405.4	(A)	Square Rubble Coursed Rubble Masonry (first sort)					
		a) Material					

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Stone	cum	5.500	5.500	5.500	
		Through and bond stone (35no.x0.24mx0.24mx0.3 9m = 0.79 cu.m)	each	35.000	35.000	35.000	
		Cement mortar 1:3 (Rate taken from sub- analysis items 21.01 A)	cum	1.500	1.500	1.500	
	b) Labour						
		Mate	day	0.878	0.878	0.878	
		Mason	day	9.975	9.975	9.975	
		Mazdoor	day	11.970	11.970	11.970	
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 5 cum = a+b+c+d					
		Rate per cum (a+b+c+d)/5					

1405.3 (B) Random Rubble Masonry

(coursed/uncoursed)

Unit = cum

Taking output = 5 cum

a) Material

Stone	cum	5.500	5.500	5.500
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Through and bond stone	each	35.000	35.000	35.000
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(35nos.x0.24mx0.24mx0.
39m = 0.79 cu.m)

Cement mortar 1:3 (Rate taken from sub- analysis items 21.01 A)	cum	1.550	1.550	1.550
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b) Labour

Mate	day	0.798	0.798	0.798
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Mason	day	7.980	7.980	7.980
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Mazdoor	day	11.970	11.970	11.970
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c) Overhead charges

d) Contractor's profit

@ on (a+b)	@ on (a+b)	@ on (a+b)
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@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
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Cost for 5 cum = a+b+c+d

Rate per cum (a+b+c+d)/5

Note The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.

**15.07 1300 &
2200**

**Brick masonry work in 1:3 in
sub-structure complete
excluding pointing and
plastering, as per drawing
and Technical Specifications**

Unit = cum

Taking output = 1 cum

a) Material

Bricks 1st class	each	500.000	500.000	500.000
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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.240	0.240	0.240	
		Water for curing	KL	0.483	0.483	0.483	
	b) Labour						
		Mate	day	0.085	0.085	0.085	
		Mason	day	1.064	1.064	1.064	
		Mazdoor	day	1.064	1.064	1.064	
		Add for scaffolding @ 5 Percent of cost of material and labour					
	c) Machinery						
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.003 x L1 + 0.020			
		(ii) 12 KL capacity	hour		0.004 x L1 + 0.027		
		(iii) 6 KL capacity	hour			0.009 x L1 + 0.054	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Rate per cum (a+b+c+d+e)

15.08 1300 & 2200 Pointing with cement mortar (1:3) on brick work in substructure as per Technical Specifications

Unit = 10 sqm

Taking output = 10 sqm

a) Material

Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.030	0.030	0.030
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b) Labour

Mate	day	0.053	0.053	0.053
Mason	day	0.665	0.665	0.665
Mazdoor	day	0.665	0.665	0.665

c) Overhead charges

@ on (a+b)

d) Contractor's profit

@ on
(a+b+c)

@ on
(a+b+c)

@ on
(a+b+c)

Rate per 10 sqm (a+b+c+d)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
15.09	1300 & 2200	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications Unit = 10 sqm Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.144	0.144	0.144	
		Water for curing	KL	0.139	0.139	0.139	
		b) Labour					
		Mate	day	0.053	0.053	0.053	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.665	0.665	0.665	
		c) Machinery					
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.001 x L1 + 0.006			
		(ii) 12 KL capacity	hour		0.001 x L1 + 0.008		
		(iii) 6 KL capacity	hour			0.003 x L1 + 0.016	
		d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per 10 sqm (a+b+c+d+e)					

Note:- The number of masons and Mazdoors already catered in the cement mortar have been taken into account while providing these categories in brick masonry, pointing and plastering.

15.10	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications
		A Random Rubble Masonry
		(coursed/uncoursed)
		Unit = cum
		Taking output = 1 cum
		a) Material
		Stone cum 1.000 1.000 1.000
		Through and bond stone No 7.000 7.000 7.000
		(7 no.x 0.24 m x 0.24 m x 0.39 m = 0.16 cum)

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)		0.330	0.330	0.330	
		Water for curing		0.966	0.966	0.966	
	b) Labour						
		Mate		0.128	0.128	0.128	
		Mason		1.596	1.596	1.596	
		Mazdoor		1.596	1.596	1.596	
		Add for scaffolding @ 5 percent of cost of material and labour					
	c) Machinery						
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)					
		(i) 16 KL capacity	hour	0.007 x L1 + 0.040			
		(ii) 12 KL capacity	hour		0.009 x L1 + 0.054		
		(iii) 6 KL capacity	hour			0.018 x L1 + 0.107	
	d) Overhead charges			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e) Contractor's profit			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	Rate per cum (a+b+c+d+e)						

15.10 B Coursed rubble masonry (first sort)

Unit = cum

Taking output = 1 cum

a) Material

Stone	cum	1.100	1.100	1.100
Through and bond stone	each	7.000	7.000	7.000
(7 no.x 0.24 m x 0.24 m x 0.39 m = 0.16 cum)				
Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.300	0.300	0.300

Water for curing

KL 0.966 0.966 0.966

b) Labour

Mate	day	0.160	0.160	0.160
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.995	1.995	1.995

Add for scaffolding @ 5 Percent of cost of material and labour

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

c) Machinery

Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)

(i) 16 KL capacity	hour	0.007 x L1 + 0.040			
(ii) 12 KL capacity	hour		0.009 x L1 + 0.054		
(iii) 6 KL capacity	hour			0.018 x L1 + 0.107	
d) Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
e) Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Rate per cum (a+b+c+d+e)

15.10

C Ashlar masonry (first sort)

Plain ashlar

Unit = cum

Taking output = 1 cum

a) Material

Stone	cum	1.110	1.110	1.110
Through and bond stone	each	7.000	7.000	7.000
(7no.x0.24mx0.24mx0.39 m = 0.16 cu.m)				
Cement mortar 1:3 (Rate taken from sub- analysis items 21.01 A)	cum	0.330	0.330	0.330
Water for curing	KL	0.966	0.966	0.966

b) Labour for masonry work

Mate	day	0.266	0.266	0.266
Mason	day	3.325	3.325	3.325
Mazdoor	day	3.325	3.325	3.325

Add for scaffolding @ 5
Percent of cost of a)
Material and b) Labour

c) Machinery

Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and spreading @ 30 mins per trip)

(i) 16 KL capacity	hour	0.007 x L1 + 0.040	
(ii) 12 KL capacity	hour		0.009 x L1 + 0.054

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Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 6 KL capacity	hour				0.018 x L1 + 0.107
	d)	Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	e)	Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Rate per cum (a+b+c+d+e)					
	Note	The labour already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.					
15.11	1500, 1700 & 2100	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.					
	A	PCC Grade M15					
	Case I	PCC Grade M15 using batching plant & Concrete pump					
		Unit = cum					
		Taking output = 30 cum					
	a)	Material					
		Per Cum Basic Cost (Rate taken from sub- analysis items 21.03)	cum	30.000	30.000	30.000	
		Water for curing	KL	15.750	15.750	15.750	
	b)	Labour					
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
	c)	Machinery					
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.109 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.143 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.292 x L1 + 1.750	
	d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					

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

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

Cost for 30 cum = a+b+c+d+e+f

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

**Case II PCC Grade M15 using
batching plant & manual
placing**

Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (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	0.505	0.505	0.505
Mason	day	1.995	1.995	1.995
Mazdoor	day	10.640	10.640	10.640

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833

Water tanker (speed @
10 km/hr. and return
speed @ 15 km/hr. and
30 mins for unloading)

(i) 16 KL capacity	hour	0.109 x L1 + 0.328		
(ii) 12 KL capacity	hour		0.146 x L1 + 0.438	
(iii) 6 KL capacity	hour			0.292 x L1 + 0.875

**d) Formwork @ 10 Percent
on cost of concrete i.e.
cost of material, labour
and machinery**

e) Overhead charges

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

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

CHAPTER: 15- BOX CELL STRUCTURES

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

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.04)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.152	0.152	0.152
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.813	1.813	1.813

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	0.219 x L1 + 0.656		
(i) 16 KL capacity	hour		0.292 x L1 + 0.875	
(ii) 12 KL capacity	hour			
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery

e) Overhead charges

@ on (a+b+c+d)

f) Contractor's profit

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

@ on (a+b+c+d)

@ 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

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)				
				Large	Medium	Small					
b) Labour											
For pouring and placing											
		Mate	day	0.505	0.505	0.505					
		Mason	day	1.995	1.995	1.995					
		Mazdoor	day	10.640	10.640	10.640					
c) Machinery											
Transit truck agitator											
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1					
		For unloading	hour	0.833	0.833	0.833					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)									
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328							
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438						
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875					
d) Formwork @ 10 Percent											
		on cost of concrete i.e. cost of material, labour and machinery									
e) Overhead charges											
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)					
f) Contractor's profit											
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)					
Cost for 15 cum = a+b+c+d+e+f											
Rate per cum = (a+b+c+d+e+f)/15											

15.11

C RCC Grade M20

**Case I RCC Grade M20 using
batching plant transit mixer
& Concrete pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.05)	cum	30.000	30.000	30.000
Water for curing	kL	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

CHAPTER: 15- BOX CELL STRUCTURES

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

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)				
(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery

e) Overhead charges

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

@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)
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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	kI	7.875	7.875	7.875

b) Labour

For pouring and placing

Mate	day	0.559	0.559	0.559
Mason	day	1.995	1.995	1.995
Mazdoor	day	11.970	11.970	11.970

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)				

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
	d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 15 cum = a+b+c+d+e+f					
		Rate per cum = (a+b+c+d+e+f)/15					

15.11

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	kI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.152	0.152	0.152
Mason	day	1.995	1.995	1.995
Mazdoor	day	1.813	1.813	1.813

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer

pump	hour	0.726	0.726	0.726
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Water tanker (speed @
10 km/hr. and return
speed @ 15 km/hr. and
30 mins for unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656
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(ii) 12 KL capacity	hour	0.292 x L1 + 0.875
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CHAPTER: 15- BOX CELL STRUCTURES

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

(iii) 6 KL capacity	hour	0.583 x L1 + 1.75
d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery		
e) Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)
f) Contractor's profit	@ 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	0.505	0.505	0.505
Mason	day	1.995	1.995	1.995
Mazdoor	day	10.640	10.640	10.640

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)

(i) 16 KL capacity	hour	0.109 x L1 + 0.328	
(ii) 12 KL capacity	hour		0.146 x L1 + 0.438
(iii) 6 KL capacity	hour		0.292 x L1 + 0.875

d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery

CHAPTER: 15- BOX CELL STRUCTURES

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	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

**Hydraulic Boom placer
pump**

Water tanker (speed @
10 km/hr. and return
speed @ 15 km/hr. and
30 mins for unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

**d) Formwork @ 10 Percent
on cost of concrete i.e.
cost of material, labour
and machinery**

e) Overhead charges

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

Cost for 30 cum = a+b+c+d+e+f

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

CHAPTER: 15- BOX CELL STRUCTURES

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

Case II **RCC Grade M25 using
batching plant transit mixer
& manual placing**

Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis items 21.07)	cum	15.000	15.000	15.000
Water for curing	Kl	7.875	7.875	7.875

b) Labour

For pouring and placing

Mate	day	0.559	0.559	0.559
Mason	day	1.995	1.995	1.995
Mazdoor	day	11.970	11.970	11.970

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833

Water tanker (speed @
10 km/hr. and return
speed @ 15 km/hr. and
30 mins for unloading)

(i) 16 KL capacity	hour	0.109 x L1 + 0.328		
(ii) 12 KL capacity	hour		0.146 x L1 + 0.438	
(iii) 6 KL capacity	hour			0.292 x L1 + 0.875

**d) Formwork @ 10 Percent
on cost of concrete i.e.
cost of material, labour
and machinery**

e) Overhead charges

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

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)/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

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a) Material							
		Per Cum Basic Cost (Rate taken from sub-analysis items 21.08)	cum	30.000	30.000	30.000	
		Water for curing	Kl	15.750	15.750	15.750	
b) Labour							
		For pouring and placing					
		Mate	day	0.152	0.152	0.152	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	1.813	1.813	1.813	
c) Machinery							
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump		hour	0.726	0.726	0.726
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery							
e) Overhead charges							
				@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f) Contractor's profit							
				@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
Cost for 30 cum = a+b+c+d+e+f							
Rate per cum = (a+b+c+d+e+f)/30							

**Case II PCC Grade M30 using
batching plant transit mixer
& manual placing**

Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.08)	cum	15.000	15.000	15.000
Water for curing	Kl	7.875	7.875	7.875

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)				
				Large	Medium	Small					
b) Labour											
For pouring and placing											
		Mate	day	0.505	0.505	0.505					
		Mason	day	1.995	1.995	1.995					
		Mazdoor	day	10.640	10.640	10.640					
c) Machinery											
Transit truck agitator											
		For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1					
		For unloading	hour	0.833	0.833	0.833					
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)									
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328							
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438						
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875					
d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery											
e) Overhead charges											
@ on (a+b+c+d)											
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)/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	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

CHAPTER: 15- BOX CELL STRUCTURES

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

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726
Hydraulic Boom placer pump	hour	0.726	0.726	0.726
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)				
(i) 16 KL capacity	hour	0.219 x L1 + 0.656		
(ii) 12 KL capacity	hour		0.292 x L1 + 0.875	
(iii) 6 KL capacity	hour			0.583 x L1 + 1.75

d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery

e) Overhead charges

@ on
(a+b+c+d)

f) Contractor's profit

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

Cost for 30 cum = a+b+c+d+e+f

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

Case II RCC Grade M30 using batching plant transit mixer & manual placing

Unit = cum

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.09)	cum	15.000	15.000	15.000
Water for curing	kL	7.875	7.875	7.875

b) Labour

For pouring and placing

Mate	day	0.559	0.559	0.559
Mason	day	1.995	1.995	1.995
Mazdoor	day	11.970	11.970	11.970

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.109 x L1 + 0.328			
		(ii) 12 KL capacity	hour		0.146 x L1 + 0.438		
		(iii) 6 KL capacity	hour			0.292 x L1 + 0.875	
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

15.11

H RCC Grade M35

**Case I RCC Grade M35 using
batching plant transit mixer
& Concrete pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub- analysis items 21.11)	cum	30.000	30.000	30.000
Water for curing	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne- km	75 x L1	75 x L1	75 x L1
For unloading	hour	0.726	0.726	0.726

**Hydraulic Boom placer
pump**

Water tanker (speed @
10 km/hr. and return
speed @ 15 km/hr. and
30 mins for unloading)

(i) 16 KL capacity	hour	0.219 x L1 + 0.656
(ii) 12 KL capacity	hour	0.292 x L1 + 0.875

CHAPTER: 15- BOX CELL STRUCTURES

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

	(iii) 6 KL capacity	hour	0.583 x L1 + 1.75
d)	Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery		
e)	Overhead charges	@ on (a+b+c+d)	@ on (a+b+c+d)
f)	Contractor's profit	@ 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	0.559	0.559	0.559
Mason	day	1.995	1.995	1.995
Mazdoor	day	11.970	11.970	11.970

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L1	37.5 x L1	37.5 x L1
For unloading	hour	0.833	0.833	0.833

Water tanker (speed @
10 km/hr. and return
speed @ 15 km/hr. and
30 mins for unloading)

(i) 16 KL capacity	hour	0.109 x L1 + 0.328		
(ii) 12 KL capacity	hour		0.146 x L1 + 0.438	
(iii) 6 KL capacity	hour			0.292 x L1 + 0.875

d) Formwork @ 10 Percent
on cost of concrete i.e.
cost of material, labour
and machinery

e) Overhead charges

@ on
(a+b+c+d)

f) Contractor's profit

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

Cost for 15 cum = a+b+c+d+e+f

CHAPTER: 15- BOX CELL STRUCTURES

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

15.11	I	RCC Grade M40	Rate per cum = (a+b+c+d+e+f)/15					
		Case I RCC Grade M40 using batching plant transit mixer & Concrete pump	Unit = cum					
Taking output = 30 cum								
a) Material								
Per Cum Basic Cost cum 30.000 30.000 30.000								
(Rate taken from sub-analysis items 21.12)								
Water for curing KL 15.750 15.750 15.750								
b) Labour								
For pouring and placing								
Mate day 0.206 0.206 0.206								
Mason day 1.995 1.995 1.995								
Mazdoor day 3.143 3.143 3.143								
c) Machinery								
Transit truck agitator								
For transportation tonne-km 75 x L 75 x L 75 x L								
(6 cum Capacity)								
For unloading hour 0.726 0.726 0.726								
Hydraulic Boom placer pump								
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)								
(i) 16 KL capacity hour 0.219 x L1 + 0.656								
(ii) 12 KL capacity hour 0.292 x L1 + 0.875								
(iii) 6 KL capacity hour 0.583 x L1 + 1.75								
d) Formwork @ 10 Percent on cost of concrete i.e. cost of material, labour and machinery								
e) Overhead charges @ on (a+b+c+d) @ on (a+b+c+d) @ on (a+b+c+d)								
f) Contractor's profit @ on (a+b+c+d+e) @ on (a+b+c+d+e) @ on (a+b+c+d+e)								

Cost for 30 cum = a+b+c+d+e+f

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

**Case II RCC Grade M40 using
batching plant transit mixer
& manual placing**
Unit = cum

CHAPTER: 15- BOX CELL STRUCTURES

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

Taking output = 15 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.12)	cum	15.000	15.000	15.000
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Water for curing	kL	7.875	7.875	7.875
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b) Labour

For pouring and placing

Mate	day	0.559	0.559	0.559
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Mason	day	1.995	1.995	1.995
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Mazdoor	day	11.970	11.970	11.970
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c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	37.5 x L	37.5 x L	37.5 x L
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For unloading	hour	0.833	0.833	0.833
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Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	0.208 x L1 + 0.625		
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(i) 16 KL capacity	hour	0.208 x L1 + 0.625		
(ii) 12 KL capacity	hour		0.278 x L1 + 0.833	
(iii) 6 KL capacity	hour			0.556 x L1 + 1.667

**d) Formwork @ 10 Percent
on cost of concrete i.e.
cost of material, labour
and machinery**

e) Overhead charges

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

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

Cost for 15 cum = a+b+c+d+e+f

Rate per cum = (a+b+c+d+e+f)/15

**15.12 1500,
1700 &
2100** Plain/Reinforced Cement
Concrete for wall & slab etc.
complete as per Drawing and
Technical Specifications.

A RCC Grade M20
RCC Grade M20 using
batching plant transit mixer
& Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.05)	cum	30.000	30.000	30.000
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CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water for curing	Kl	15.750	15.750	15.750	
b)	Labour						
		For pouring and placing					
		Mate	day	0.206	0.206	0.206	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
c)	Machinery						
		Transit truck agitator					
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
		Hydraulic Boom placer pump	hour	0.726	0.726	0.726	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d)	Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

15.12

B RCC Grade M25

RCC Grade M25 using batching plant transit mixer & Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.07)	cum	30.000	30.000	30.000
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Water for curing

Kl	15.750	15.750	15.750
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b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
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CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mason	day	1.995	1.995	1.995	
		Mazdoor	day	3.143	3.143	3.143	
c) Machinery							
Transit truck agitator							
		For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L	
		For unloading	hour	0.726	0.726	0.726	
Hydraulic Boom placer pump							
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d) Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery							
e) Overhead charges							
@ on (a+b+c+d)							
f) Contractor's profit							
@ 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	kI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Machinery						
	Transit truck agitator						
	For transportation (6 cum Capacity)	tonne-km		75 x L	75 x L	75 x L	
	For unloading	hour		0.726	0.726	0.726	
	Hydraulic Boom placer pump	hour		0.726	0.726	0.726	
	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour		0.219 x L1 + 0.656			
	(i) 16 KL capacity	hour					
	(ii) 12 KL capacity	hour			0.292 x L1 + 0.875		
	(iii) 6 KL capacity	hour					0.583 x L1 + 1.75
d)	Formwork @ 25 Percent						
	on cost of concrete i.e.						
	cost of material, labour						
	and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

15.12

D RCC Grade M35
RCC Grade M35 using
batching plant transit mixer
& Concrete pump

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.11)	cum	30.000	30.000	30.000
Water for curing	KI	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
d)	Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery						
e)	Overhead charges			@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
f)	Contractor's profit			@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	

Cost for 30 cum = a+b+c+d+e+f

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

15.12

E RCC Grade M40

**RCC Grade M40 using
batching plant transit mixer
& Concrete pump**

Unit = cum

Taking output = 30 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis items 21.12)	cum	30.000	30.000	30.000
Water for curing	Kl	15.750	15.750	15.750

b) Labour

For pouring and placing

Mate	day	0.206	0.206	0.206
Mason	day	1.995	1.995	1.995
Mazdoor	day	3.143	3.143	3.143

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity)	tonne-km	75 x L	75 x L	75 x L
For unloading	hour	0.726	0.726	0.726

Hydraulic Boom placer pump

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(i) 16 KL capacity	hour	0.219 x L1 + 0.656			
		(ii) 12 KL capacity	hour		0.292 x L1 + 0.875		
		(iii) 6 KL capacity	hour			0.583 x L1 + 1.75	
	d)	Formwork @ 25 Percent on cost of concrete i.e. cost of material, labour and machinery					
	e)	Overhead charges		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
	f)	Contractor's profit		@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	@ on (a+b+c+d+e)	
		Cost for 30 cum = a+b+c+d+e+f Rate per cum = (a+b+c+d+e+f)/30					

15.13 1600

**Supplying, Fitting and Placing
un-coated HYSD bar
Reinforcement in Foundation
complete as per Drawing and
Technical Specifications.**

Unit = MT

Taking output = 8 MT

a) Material

MS bars including 5 Percent overlaps and wastage	tonne	8.400	8.400	8.400
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Binding wire	Kg	48.000	48.000	48.000
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b) Labour for

**straightening, cutting,
bending, shifting to site,
tying and placing in
position**

Mate	day	0.213	0.213	0.213
Blacksmith	day	1.330	1.330	1.330
Mazdoor	day	3.990	3.990	3.990

c) Machinery

Cutting Machine	hour	5.333	5.333	5.333
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Bending Machine	hour	5.333	5.333	5.333
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Electric generator 15 KVA	hour	5.333	5.333	5.333
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Tipper

Tipper for Transportation

(i) 14 cum capacity	t.km	8 x L		
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(ii) 14 cum capacity	t.km		8 x L	
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(iii) 10 cum capacity	t.km			8 x L
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Loading & Unloading Time	hour			
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(i) 14 cum capacity	hour	1.000		
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(ii) 14 cum capacity	hour		1.280	
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CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		(iii) 10 cum capacity Light weight Crane	hour				1.778
		At cutting bending yard	hour	2.000	2.000	2.000	
		At site	hour	2.000	2.000	2.000	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c+d)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 8 MT (a+b+c+d+e)					
		Rate for per MT (a+b+c+d+e)/8					
15.14	2706 & 2200	Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V: 20H towards drawingface . Complete as per drawing and Technical Specifications Unit = Nos. Taking output = 30 Nos.					
	a)	Material					
		AC pipe 100 mm dia. (including wastage @ 5 Percent)	metre	31.500	31.500	31.500	
		Average length of weep hole is taken as one metre for the purpose of estimating.					
		MS clamp	Each	30.000	30.000	30.000	
		collar for AC pipe (average) taking 10% of above pipe rate	Each	10.000	10.000	10.000	
		Cement mortar 1:3 (Rate taken from sub-analysis items 21.01 A)	cum	0.050	0.050	0.050	
	b)	Labour					
		Mate	day	0.040	0.040	0.040	
		Mason	day	0.665	0.665	0.665	
		Mazdoor	day	0.333	0.333	0.333	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 30 m = a+b+c+d					
		Rate per m (a+b+c+d)/30					

Note

1. In case of stone masonry, the size of the weep hole shall be 150 mm x 80 mm or circular with 150 mm diameter.
2. For structure in stone masonry, the weep holes shall be deemed to be included in the item of stone masonry work and shall not be paid separately.

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																
				Large	Medium	Small																																	
15.15	2700	<p>PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification</p> <p>Unit = cum</p> <p>Taking output = 1 cum</p> <p>a) Material</p> <p>Case I PCC Grade M15 using batching plant & Concrete pump</p> <p>a) Material</p> <table> <tr> <td>Concrete, Item No - 15.11</td> <td>cum</td> <td>1.000</td> </tr> <tr> <td>(A), Case-I excluding formworks</td> <td></td> <td></td> </tr> <tr> <td>Concrete, Item No - 15.11</td> <td></td> <td>1.000</td> </tr> <tr> <td>(A), Case-I excluding formworks</td> <td></td> <td></td> </tr> <tr> <td>Concrete, Item No - 15.11</td> <td></td> <td>1.000</td> </tr> <tr> <td>(A), Case-I excluding formworks</td> <td></td> <td></td> </tr> </table> <p>b) Overhead charges</p> <p>c) Contractor's profit</p> <p>Cost for 1 Cum = a+b+c</p> <p>Rate per Cum (a+b+c)</p> <p>b) Material</p> <p>Case II PCC Grade M15 using batching plant & manual placing</p> <table> <tr> <td>Concrete, Item No - 15.11 (A),</td> <td>cum</td> <td>1.000</td> </tr> <tr> <td>Case-II excluding formworks</td> <td></td> <td></td> </tr> <tr> <td>Concrete, Item No - 15.11 (A),</td> <td></td> <td>1.000</td> </tr> <tr> <td>Case-II excluding formworks</td> <td></td> <td></td> </tr> <tr> <td>Concrete, Item No - 15.11 (A),</td> <td></td> <td>1.000</td> </tr> <tr> <td>Case-II excluding formworks</td> <td></td> <td></td> </tr> </table> <p>b) Overhead charges</p> <p>c) Contractor's profit</p> <p>Cost for 1 Cum = a+b+c</p> <p>Rate per Cum (a+b+c)</p>	Concrete, Item No - 15.11	cum	1.000	(A), Case-I excluding formworks			Concrete, Item No - 15.11		1.000	(A), Case-I excluding formworks			Concrete, Item No - 15.11		1.000	(A), Case-I excluding formworks			Concrete, Item No - 15.11 (A),	cum	1.000	Case-II excluding formworks			Concrete, Item No - 15.11 (A),		1.000	Case-II excluding formworks			Concrete, Item No - 15.11 (A),		1.000	Case-II excluding formworks			
Concrete, Item No - 15.11	cum	1.000																																					
(A), Case-I excluding formworks																																							
Concrete, Item No - 15.11		1.000																																					
(A), Case-I excluding formworks																																							
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(A), Case-I excluding formworks																																							
Concrete, Item No - 15.11 (A),	cum	1.000																																					
Case-II excluding formworks																																							
Concrete, Item No - 15.11 (A),		1.000																																					
Case-II excluding formworks																																							
Concrete, Item No - 15.11 (A),		1.000																																					
Case-II excluding formworks																																							
15.16	1500,160 0,1700 & 2704	<p>Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification</p> <p>Unit = 1 cum</p> <p>Taking output = 1 cum</p>																																					

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a) Material							
		Cement concrete M30 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 = 1 No. Taking output = 1 No.					
a) Material							
		Corrosion resistant Structural steel including 5 Percent wastage	Kg	4.000	4.000	4.000	
		GI pipe 100mm dia	metre	0.320	0.320	0.320	
		GI bolt 10 mm Dia	each	6.000	6.000	6.000	
		Galvanised MS flat clamp	each	2.000	2.000	2.000	
b) Labour							
		For fabrication					
		Mate	day	0.002	0.002	0.002	
		Skilled (Blacksmith, welder etc.)	day	0.027	0.027	0.027	
		Mazdoor	day	0.027	0.027	0.027	
		For fixing in position					
		Mate	day	0.011	0.011	0.011	
		Mason	day	0.013	0.013	0.013	
		Mazdoor	day	0.266	0.266	0.266	
		Add @ 5 Percent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.					

CHAPTER: 15- BOX CELL STRUCTURES

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

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

Rate per metre (a+b+c+d)

- Note**
1. In case of viaducts in urban areas, the drainage spouts should be connected with suitably located pipelines to discharge the surface run-off to drains provided at ground level.
 2. In case of bridges, sufficient length of G.I Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.

15.18 2702

Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications

Unit = 1 cum

Taking output = 1 cum

a) Material

Cement concrete M30	cum	1.000	1.000	1.000
Grade Refer relevant item of concrete in Item 15.12 (C) excluding formwork				
HYSD bar reinforcement	tonne	0.075	0.075	0.075
Rate as per item No 15.13 (Excluding OH & CP)				

b) Labour

Mazdoor for cleaning deck slab concrete surface.	day	0.200	0.200	0.200
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c) Overhead charges

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

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

Rate per cum (a+b+c+d)

15.19 516 & 2702

Mastic Asphalt

Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in Table 500-39, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface

CHAPTER: 15- BOX CELL STRUCTURES

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

with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 516.

Unit = sqm

Taking output = 72.46 sqm

**(2 tonnes)(0.869 cum)
assuming a density of 2.3
tonnes/cum.**

a) Labour

Mate	day	0.599	0.599	0.599
Mazdoor	day	14.630	14.630	14.630
Mazdoor (Skilled)	day	0.333	0.333	0.333

b) Machinery

Mechanical broom @ 1250 sqm per hour	hour	0.060	0.060	0.060
Air compressor 250 cfm	hour	0.060	0.060	0.060
Mastic cooker 1 tonne capacity	hour	6.000	6.000	6.000
Bitumen boiler 1500 litres capacity	hour	6.000	6.000	6.000
Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	1.000	1.000

c) Material

Base mastic (without coarse aggregates) = 60 Percent

Coarse aggregate (3.35mm to 9.5 mm size) = 40 Percent .

Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRI for a specific case)

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
	i)	Bitumen 80/100 or 60/70 or 30/40 @ 10.2 Percent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	0.204	0.204	
	ii)	Crusher stone dust @ 31.9 Percent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.390	0.390	0.390	
	iii)	Lime stone dust filler with calcium carbonate content not less than 80 Percent by weight @ 17.92 Percent by weight of mix = $2 \times 17.92/100 = 0.36$	tonne	0.360	0.360	0.360	
	iv)	Coarse aggregates 9.5 mm to 3.35 mm size @ 40 Percent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.550	0.550	0.550	
	v)	Pre-coated stone chips of 9.5 mm nominal size for skid resistance = $72.46 \times 0.005/10 = 0.036$	cum	0.036	0.036	0.036	
	vi)	Bitumen for coating of chips @ 2 Percent by weight = $0.036 \times 1.456 \times 2/100 = 0.001048$ MT = 1.05kg	kg	1.050	1.050	1.050	
d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		
e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)		

Cost for 72.46 sqm = a+b+c+d+e

Rate per sqm = $(a+b+c+d+e)/72.46$

Note

1. The rates for 6 mm or any other thickness may be worked out on pro-rata basis.
2. Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.
3. The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.

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

4. This rate analysis is based on design made by 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 MoRTH Specifications.

15.20 800

Crash Barriers for Bridge

The rate analysis for semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.

The rate analysis for rigid crash barrier in reinforced cement concrete, have been made and included in chapter-14 on Super-Structure.

15.21 800

Painting on concrete surface

Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 sqm.

Unit = sqm

Taking output = 10 sqm

a) Labour

Mate	day	0.027	0.027	0.027
Painter	day	0.333	0.333	0.333
Mazdoor (Skilled)	day	0.333	0.333	0.333

b) Material

Water based paint of approved quality for cement concrete surface	Litres	5.000	5.000	5.000
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c) Overhead charges

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

d) Contractor's profit

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

Cost for 10 sqm (a+b+c+d)

Rate per sqm (a+b+c+d)/10

CHAPTER: 15- BOX CELL STRUCTURES

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

15.22 2605 Filler joint

- (i) **Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.**

Unit = Running meter

Taking output = 12 m

a) Labour

Cutting, bending, carrying & fixing etc.

Mate	day	0.053	0.053	0.053
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Mazdoor	day	0.665	0.665	0.665
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Mazdoor (Skilled)	day	0.665	0.665	0.665
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b) Material

Copper plate - 12m long x 250 mm wide	kg	55.000	55.000	55.000
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Area = $12 \times 0.25 = 3 \text{ sqm}$

Weight = $3 \times 0.002 \times 8900 = 53.4 \text{ kg}$

Wastage @ 2.5 Percent = $1.33 \text{ kg}/54.73 \text{ kg} \text{ say} = 55 \text{ kg.}$

c) Overhead charges

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

d) Contractor's profit

@ on

(a+b+c)

@ on

(a+b+c)

Cost for 12 m = $(a+b+c+d)$

Rate per m = $(a+b+c+d)/12$

- 15.22 (ii) Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.**

Unit = Running meter

Taking output = 12 m

a) Labour

For carrying, placing & fixing.

Mate	day	0.011	0.011	0.011
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Mazdoor	day	0.133	0.133	0.133
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Mazdoor (Skilled)	day	0.133	0.133	0.133
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b) Material

20 mm thick compressible fibre board	sqm	3.000	3.000	3.000
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12 m long x 25 cm deep.

Area = $12 \times 0.25 = 3 \text{ sqm}$

CHAPTER: 15- BOX CELL STRUCTURES

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
15.22	(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.					
		Unit = Running meter					
		Taking output = 12 m					
	a)	Labour					
		Mate	day	0.016	0.016	0.016	
		Mazdoor	day	0.266	0.266	0.266	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
	b)	Material					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.600	3.600	3.600	
	c)	Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d)	Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 12 m = (a+b+c+d)					
		Rate per m = (a+b+c+d)/12					
15.22	(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 Percent bitumen by weight					
		Unit = Running meter					
		Taking output = 12 m					
		12m long x 100 mm wide x 10mm deep recess					
	a)	Labour					
		Mate	day	0.032	0.032	0.032	
		Mazdoor	day	0.665	0.665	0.665	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
	b)	Material					
		Sand	cum	0.012	0.012	0.012	
		Volume 12 x 0.1 x 0.01 = 0.012 cum					

CHAPTER: 15- BOX CELL STRUCTURES

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

		Weight $0.012 \times 1400 =$ 16.8kg Bitumen	cum	0.001	0.001	0.001	
		$16.8 \times 0.06 = 1 \text{ kg}$					
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	0.372	0.372	0.372	
		Mazdoor	day	9.310	9.310	9.310	
	b)	Material					
		Granular material	cum	12.000	12.000	12.000	
	c)	Machinery					
		Plate compactor/power rammer	hour	2.500	2.500	2.500	
		Water Tanker 6 KL capacity	hour	0.050	0.050	0.050	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
		Cost for 10 cum of granular backfill = a+b+c+d+e					
		Rate per cum = (a+b+c+d+e)/10					

15.23	B	Sandy material					
		a) Labour					
		Mate	day	0.372	0.372	0.372	
		Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310	
	b)	Material					
		Sand	cum	12.000	12.000	12.000	
	c)	Machinery					
		Plate compactor/power rammer	hour	2.500	2.500	2.500	
		Water Tanker 6 KL capacity	hour	0.060	0.060	0.060	

CHAPTER: 15- BOX CELL STRUCTURES

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

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

Cost for 10 cum of sandy backfill =

a+b+c+d+e

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

- 15.24 710.1.4.
of IRC:78
and
2504.2** Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification.

Unit = cum

Taking output = 10 cum.

a) Labour

Mate	day	0.426	0.426	0.426
Mazdoor for filling, watering, ramming etc.	day	9.310	9.310	9.310
Mazdoor (Skilled)	day	1.330	1.330	1.330

b) Material

Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.000	12.000	12.000
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c) Machinery

Water Tanker of 6 KL capacity	hour	0.060	0.060	0.060
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d) Overhead charges

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

@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)
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cost for 10 cum = a+b+c+d+e

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

- 15.25** Painting with synthetic enamel paint bridge No. and span arrangements

Painting two coats after filling the surface with synthetic

CHAPTER: 15- BOX CELL STRUCTURES

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

enamel paint bridge No. and span arrangements as per as directed by Engineer.

Unit = Nos.

Taking output = 1 Nos.

a) Labour

Mate	day	0.008	0.008	0.008
Painter	day	0.133	0.133	0.133
Mazdoor	day	0.067	0.067	0.067

b) Material

Paint conforming to requirement of clause 803.3.	Litre	0.300	0.300	0.300
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Add for scaffolding @ 1 Percent of labour cost where required

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

c) Overhead charges

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

d) Contractor's profit

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

Cost for 1 No. = a+b+c+d

Rate per Nos. = (a+b+c+d)

CHAPTER – 16
RIVER TRAINING AND PROTECTION WORKS

PREAMBLES:

- 1 Three types of aprons on riverbed as under have been catered.
 - a) Boulder apron laid dry
 - b) Boulder apron laid in wire crates
 - c) Apron laid in cement concrete blocks on M 15
- 2 A toe wall for toe protection of pitching can be either in dry rubble masonry (uncoursed) or in nominal mix cement concrete M 15. Depending upon the design, the rates may be adopted under respective clauses.
- 3 Flooring has been proposed in dry rubble stone, rubble stone laid in Cement Mortar 1:3 and with cement concrete blocks M 15.
- 4 Curtain walls proposed are of the following two types:
 - a) Course rubble stone masonry (1st sort) in Cement Mortar 1:3.
 - b) Cement concrete M 15 grade.
- 5 The rate analysis for gabion structures comprising of stone boulders laid in wire crates have been included. Such structures are suited as retaining structures and for erosion in river training works especially for situations where some settlement of foundation is anticipated. These structures can adjust in minor settlements, being flexible structures, without losing their functional requirement.

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

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

16.01	2503	<p>Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.</p> <p>A Boulder Laid Dry Without Wire Crates.</p> <p>Unit = cum</p> <p>Taking output = 1 cum</p> <p>a) Material</p>					
		Stone	cum	1.000	1.000	1.000	
		Stone Spalls	cum	0.200	0.200	0.200	
		b) Labour					
		Mate	day	0.059	0.059	0.059	
		Mason	day	0.466	0.466	0.466	
		Mazdoor *	day	0.998	0.998	0.998	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	

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

* 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	<p>Boulder Apron Laid in Wire Crates</p> <p>Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100 mm x 100 mm mesh (weaved diagonally) including 10 Percent extra for laps and joints laid with stone boulders weighing not less than 40 kg each.</p> <p>Unit = cum</p> <p>Taking output = 3 mx1.5mx1.25m = 5.63 cum</p> <p>a) Material</p>					
		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	0.239	0.239	0.239	
		Mazdoor (Skilled)	day	1.995	1.995	1.995	
		Mazdoor*	day	3.990	3.990	3.990	

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

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

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

Cost for 5.63 cum = a+b+c+d

Rate per cum = (a+b+c+d)/5.63

* Mazdoor Including excavation for trimming for preparation of bed.

Note Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 Percent of the cost of GI wire may be added for weaving the wire crates.

16.03 2503

**Cement Concrete Blocks (size
0.5 x 0.5 x 0.5 m)**

Providing and laying of apron with cement concrete blocks of size 0.5 x 0.5 x 0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete with minimum cement content of 250 kg/cum.

Unit = cum

Taking out put = 1 cum

Concrete Grade M15	cum	1.000	1.000	1.000
(Rate taken from items				
12.08 A, Case II) including				
OH & CP				

Add 2 Percent of cost to account for excavation for preparation of bed, nominal surface reinforcement and filling of granular material in recesses between blocks.

Rate per cum

16.04 2504

Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications

A Stone/Boulder

Unit = cum

Taking output = 1 cum

a) Material

Stone weighing not less than 40kg	cum	1.000	1.000	1.000
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CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Stone spalls of minimum 25 mm size	cum	0.200	0.200	0.200	
		b) Labour					
		Mate	day	0.059	0.059	0.059	
		Mason	day	0.466	0.466	0.466	
		Mazdoor	day	0.998	0.998	0.998	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum = (a+b+c+d)					
16.04	B	Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15					
		Unit = cum					
		Taking output = 1 cum					
		Concrete Grade M15	cum	1.000	1.000	1.000	
		(Rate taken from items 12.08 A, Case II) including OH & CP					
		Add 2 Percent of cost to account for nominal surface reinforcement and filling of granular material in recesses between blocks.					
		Rate per cum					
16.05	2504	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Graded stone aggregate of required size	cum	1.200	1.200	1.200	
		b) Labour					
		Mate	day	0.067	0.067	0.067	
		Mazdoor (Skilled)	day	0.333	0.333	0.333	
		Mazdoor *	day	1.330	1.330	1.330	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Rate per cum = (a+b+c+d)					

Note:- Includes Mazdoor required for trimming of slope to proper profile and preparation of bed.

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
16.06	700 & 2504	Geotextile Filter					
		Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching.					
		Unit = sqm					
		Taking output = 10 sqm.					
		a) Labour					
		Mate	day	0.021	0.021	0.021	
		Mazdoor	day	0.399	0.399	0.399	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
		b) Material					
		Permeable synthetic geotextile including 5 Percent for overlap and wastage	sqm	11.000	11.000	11.000	
		c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 sqm = a+b+c+d					
		Rate per sqm = (a+b+c+d)/10					
16.07	2504.4	Toe protection					
		A toe wall for toe protection can either be in dry rubble masonry in case of dry rubble pitching or pitching with stones in wire crates or it can be in PCC M15 nominal mix if cement concrete block have been used for pitching. Rates for toe wall can be adopted from respective clauses depending upon approved design. The rate for excavation for foundation, dry rubble masonry and PCC M15 have been analysed and given in respective chapters.					
16.08	2505	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concrete bedding.					
	A	Rubble stone laid in cement mortar 1:3					

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

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 Stone Spalls	cum	1.000 0.200	1.000 0.200	1.000 0.200
d)	Labour Mate Mason Mazdoor (for laying stones, filling of quarry spalls)	day	0.106 0.665 1.995	0.106 0.665 1.995	0.106 0.665 1.995
e)	Overhead charges		@ on (a+c+d)	@ on (a+c+d)	@ on (a+c+d)
f)	Contractor's profit		@ on (a+b+d+e)	@ on (a+b+d+e)	@ on (a+b+d+e)

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

Note:- *Includes cement mortar for laying and filling of joints.

16.08	B	Cement Concrete blocks Grade M15 including 100 mm thick bedding Concrete Grade M15 block. (Rate taken from items 12.08 A) including OH & CP 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. Rate per cum	cum	1.000 0.330	1.000 0.330	1.000 0.330
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CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																													
				Large	Medium	Small																														
16.09	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 <table> <tr><td>Stone</td><td>cum</td><td>1.000</td><td>1.000</td><td>1.000</td></tr> <tr><td>Stone Spalls</td><td>cum</td><td>0.200</td><td>0.200</td><td>0.200</td></tr> </table> b) Labour <table> <tr><td>Mate</td><td>day</td><td>0.106</td><td>0.106</td><td>0.106</td></tr> <tr><td>Mason</td><td>day</td><td>0.665</td><td>0.665</td><td>0.665</td></tr> <tr><td>mazdoor</td><td>day</td><td>1.995</td><td>1.995</td><td>1.995</td></tr> </table> Add 1 Percent of (b) for trimming and preparation of base. c) Overhead charges <table> <tr><td></td><td>@ on (a+b)</td><td>@ on (a+b)</td><td>@ on (a+b)</td></tr> </table> d) Contractor's profit <table> <tr><td></td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td></tr> </table> Rate per cum = (a+b+c+d)	Stone	cum	1.000	1.000	1.000	Stone Spalls	cum	0.200	0.200	0.200	Mate	day	0.106	0.106	0.106	Mason	day	0.665	0.665	0.665	mazdoor	day	1.995	1.995	1.995		@ on (a+b)	@ on (a+b)	@ on (a+b)		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
Stone	cum	1.000	1.000	1.000																																
Stone Spalls	cum	0.200	0.200	0.200																																
Mate	day	0.106	0.106	0.106																																
Mason	day	0.665	0.665	0.665																																
mazdoor	day	1.995	1.995	1.995																																
	@ on (a+b)	@ on (a+b)	@ on (a+b)																																	
	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																	
16.10	2507.2	Curtain wall complete as per drawing and Technical specification A Stone masonry in cement mortar (1:3) Coursed rubble masonry (1st sort) (Rate taken from items 12.07 A) including OH & CP Rate same as per item No. 12.07 (A) including OH & CP Rate per cum or B Cement concrete Grade M15 Concrete Grade M15 (Rate taken from items 12.08 A) including OH & CP Rate per cum																																		
16.10		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																																		

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
a)	Material						
	Stone		cum	1.000	1.000	1.000	
	Stone Spalls		cum	0.200	0.200	0.200	
b)	Labour						
	Mate		day	0.067	0.067	0.067	
	Mason		day	0.333	0.333	0.333	
	Mazdoor		day	1.330	1.330	1.330	
	Add 1 Percent of cost of (a+b) for trimming and preparation of bed.						
c)	Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
d)	Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
Rate per cum = (a+b+c+d)							

16.12 2503.3 Gabion Structure for Retaining Earth

Providing and construction of a gabion structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire

Unit = cum

Taking output = $7 \times 3 \times 0.6 = 12.60$ cum

a)	Labour						
	Mate		day	0.372	0.372	0.372	
	Mazdoor		day	6.650	6.650	6.650	
	Mazdoor (Skilled)		day	2.660	2.660	2.660	
b)	Material						
	Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size.		sqm	61.000	61.000	61.000	
	Stone boulders with least dimension of 200 mm		cum	12.600	12.600	12.600	
	Stone spalls of minimum size 25 mm		cum	2.520	2.520	2.520	

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

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

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

Cost for 12.60 cum (a+b+c+d)

Rate per cum (a+b+c+d)/12.60

Note Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 Percent of the cost of GI wire may be added for weaving the wire crates.

16.13 2503.3 Gabion Structure for Erosion Control, River Training Works and Protection works

Providing and constructing gabion structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire.

Unit = cum

Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum

a) Labour

Mate	day	0.186	0.186	0.186
Mazdoor	day	3.325	3.325	3.325
Mazdoor (Skilled)	day	1.330	1.330	1.330

b) Material

Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size to cover 6.00 cum.	sqm	65.000	65.000	65.000
--	-----	--------	--------	--------

Stone boulders with least dimension of 200 mm	cum	6.000	6.000	6.000
Stone spalls of minimum size 25 mm	cum	1.200	1.200	1.200

c) Overhead charges

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

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

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 $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged 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 = $2 \times 1 \times 1 \text{ m} = 2 \text{ cum}$

a) Material

Crates made of Mesh type 10x12 (D=100 mm) Zn coated. (Mesh wire diameter 3.00 mm).	sqm	11.000	11.000	11.000
--	-----	--------	--------	--------

Surface area required =

11.00 sqm.

Stone boulder with least dimension 200mm	cum	2.000	2.000	2.000
--	-----	-------	-------	-------

b) Labour

Mate	day	0.106	0.106	0.106
------	-----	-------	-------	-------

Mason (for plain stone work) 2nd class	day	0.665	0.665	0.665
--	-----	-------	-------	-------

Mazdoor *	day	1.995	1.995	1.995
-----------	-----	-------	-------	-------

c) Overhead charges

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

d) Contractor's profit

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

Cost for 2.0 cum (a+b+c+d)

Rate per cum (a+b+c+d)/2

CHAPTER: 16- RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																															
				Large	Medium	Small																																																
16.15		Embankment Erosion Protection using Fine Aggregate Concrete Filled Fabric Form Mattress system Laying of a fine aggregate concrete grade M30 filled fabric form for erosion protection of embankments Unit = Sqm Taking output = 60 Sqm <ul style="list-style-type: none"> a) Labour <table> <tr><td>Mate</td><td>day</td><td>0.128</td><td>0.128</td><td>0.128</td></tr> <tr><td>Mazdoor</td><td>day</td><td>2.394</td><td>2.394</td><td>2.394</td></tr> <tr><td>Mazdoor (skilled)</td><td>day</td><td>0.798</td><td>0.798</td><td>0.798</td></tr> </table> b) Machinery <table> <tr><td>For Transportation Transit truck agitator 6 cum capacity</td><td>t.km</td><td>13.800 x L</td><td>13.800 x L</td><td>13.800 x L</td></tr> <tr><td>Unloading time</td><td>hour</td><td>0.145</td><td>0.145</td><td>0.145</td></tr> <tr><td>Concrete Pump</td><td>hour</td><td>0.145</td><td>0.145</td><td>0.145</td></tr> </table> c) Materials <table> <tr><td>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)</td><td>cum</td><td>6.000</td><td>6.000</td><td>6.000</td></tr> <tr><td>Fabric Form mattress with 30% shrinkage</td><td>sqm</td><td>78.000</td><td>78.000</td><td>78.000</td></tr> <tr><td>Non-Woven Geotextile to be placed under concrete filled fabric form including 15 Percent for overlap and shrinkage</td><td>sqm</td><td>9.000</td><td>9.000</td><td>9.000</td></tr> </table> d) Overhead charges <table> <tr><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td><td>@ on (a+b+c)</td></tr> </table> e) Contractor's profit <table> <tr><td>@ on (a+b+c+d)</td><td>@ on (a+b+c+d)</td><td>@ on (a+b+c+d)</td></tr> </table> 	Mate	day	0.128	0.128	0.128	Mazdoor	day	2.394	2.394	2.394	Mazdoor (skilled)	day	0.798	0.798	0.798	For Transportation Transit truck agitator 6 cum capacity	t.km	13.800 x L	13.800 x L	13.800 x L	Unloading time	hour	0.145	0.145	0.145	Concrete Pump	hour	0.145	0.145	0.145	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	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Mate	day	0.128	0.128	0.128																																																		
Mazdoor	day	2.394	2.394	2.394																																																		
Mazdoor (skilled)	day	0.798	0.798	0.798																																																		
For Transportation Transit truck agitator 6 cum capacity	t.km	13.800 x L	13.800 x L	13.800 x L																																																		
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@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																																				
@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)																																																				

Cost for 60 sqm = a+b+c+d+e

Rate per sqm = $(a+b+c+d+e)/60$

CHAPTER – 17
REPAIR AND REHABILITATION

PREAMBLES:

- 1 Removal of cement concrete wearing coat and asphaltic wearing coat has been proposed with pneumatic breakers.
- 2 The rate for external pre-stressing has been analysed for three different spans of 25,50 and 100 m.
- 3 Sealing of cranks has been proposed with cement grout, cement mortar (1:1) grout and epoxy grout by injecting with grout pump through nipples.
- 4 Bonding of new concrete with old concrete is proposed with epoxy resin.
- 5 The repair and placement of the following structures has been included:
 - a) Bridge bearings
 - b) Expansion Joints
 - c) Concrete Railing
 - d) Mild steel railing
 - e) Crash barrier

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																									
				Large	Medium	Small																										
17.01	2811	<p>Removal of existing cement concrete wearing coat including its disposal complete as per Technical Specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000 m</p> <p>Unit = Sqm (Thickness 75 mm)</p> <p>Taking output = 10 sqm</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.053</td> <td>0.053</td> <td>0.053</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>1.330</td> <td>1.330</td> <td>1.330</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories.</td> <td>hour</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>Tractor-trolley.</td> <td>hour</td> <td>0.500</td> <td>0.500</td> <td>0.500</td> </tr> </table> <p>c) Overhead charges</p> <table> <tr> <td>@ on (a+b)</td> <td>@ on (a+b)</td> <td>@ on (a+b)</td> </tr> </table> <p>d) Contractor's profit</p> <table> <tr> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table>	Mate	day	0.053	0.053	0.053	Mazdoor	day	1.330	1.330	1.330	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	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)				
Mate	day	0.053	0.053	0.053																												
Mazdoor	day	1.330	1.330	1.330																												
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																												
@ on (a+b)	@ on (a+b)	@ on (a+b)																														
@ 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	<p>Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.</p> <p>Unit = Sqm</p> <p>Taking output = 10 sqm</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.040</td> <td>0.040</td> <td>0.040</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>0.998</td> <td>0.998</td> <td>0.998</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Air Compressor 250 cfm with pneumatic breaker.</td> <td>hour</td> <td>0.750</td> <td>0.750</td> <td>0.750</td> </tr> <tr> <td>Tractor-trolley.</td> <td>hour</td> <td>0.400</td> <td>0.400</td> <td>0.400</td> </tr> </table> <p>c) Overhead charges</p> <table> <tr> <td>@ on (a+b)</td> <td>@ on (a+b)</td> <td>@ on (a+b)</td> </tr> </table> <p>d) Contractor's profit</p> <table> <tr> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table>	Mate	day	0.040	0.040	0.040	Mazdoor	day	0.998	0.998	0.998	Air Compressor 250 cfm with pneumatic breaker.	hour	0.750	0.750	0.750	Tractor-trolley.	hour	0.400	0.400	0.400	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)				
Mate	day	0.040	0.040	0.040																												
Mazdoor	day	0.998	0.998	0.998																												
Air Compressor 250 cfm with pneumatic breaker.	hour	0.750	0.750	0.750																												
Tractor-trolley.	hour	0.400	0.400	0.400																												
@ on (a+b)	@ on (a+b)	@ on (a+b)																														
@ 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	<p>Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification</p> <p>Unit = Sqm</p> <p>Taking output = 1 sqm</p>																														

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
Assuming thickness 25 mm							
a)	Material						
Cement		kg	16.000	16.000	16.000	16.000	
Graded sand		cum	0.040	0.040	0.040	0.040	
Wire mesh 50mm x 50mm size of 3mm wire		kg	2.000	2.000	2.000	2.000	
Epoxy		kg	0.670	0.670	0.670	0.670	
Accelerator compound for guniting @ 4 Percent of weight of cement		kg	0.640	0.640	0.640	0.640	
Add 2 Percent of cost of material for miscellaneous consumables like nozzles, wire brush, cotton waste etc.							
b)	Labour						
Mate		day	0.010	0.010	0.010	0.010	
Mason		day	0.053	0.053	0.053	0.053	
Mazdoor		day	0.186	0.186	0.186	0.186	
c)	Machinery						
Compressor with guniting equipment along with accessories		hour	0.100	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	1.000	
Cement, fixing compound and consumables @ 15 Percent of cost of nipple							
b)	Labour						
Mate		day	0.009	0.009	0.009	0.009	
Mazdoor (Skilled) labour for drilling		day	0.106	0.106	0.106	0.106	
Mazdoor (Skilled) labour for fixing nipple and sealing inlets		day	0.106	0.106	0.106	0.106	
Mazdoor for cutting and removing of nipples		day	0.053	0.053	0.053	0.053	
Add 10 Percent of labour cost for drilling holes etc							
c)	Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
Rate per No. = (a+b+c+d)							
17.05 2806		Sealing of cracks/porous concrete by injection process through nipples/ Grouting complete as per Technical Specification.					
	A	Cement Grout					
		Unit = kg					
		Taking output = 1 kg					
	a)	Material					
		Cement including 10 Percent wastage	kg	1.100	1.100	1.100	
		Admixtures (anti shrinkage compound) @ 20 Percent of cost of cement					
	b)	Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		Mazdoor	day	1.330	1.330	1.330	
	c)	Machinery					
		Grout pump with agitator and accessories	hour	0.100	0.100	0.100	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per kg = (a+b+c+d+e)							
	B	Cement Mortar (1:1) Grouting					
		Unit = kg					
		Taking output = 1 kg					
	a)	Material					
		Cement including 10 Percent wastage	kg	0.550	0.550	0.550	
		Sand including 10 Percent wastage	kg	0.550	0.550	0.550	
		Admixtures (anti shrinkage compound) @ 20 Percent of cost of cement					
	b)	Labour					
		Mate	day	0.059	0.059	0.059	
		Mazdoor (Skilled)	day	1.330	1.330	1.330	
		Mazdoor	day	0.133	0.133	0.133	
	c)	Machinery					
		Grout pump with agitator and accessories	hour	0.100	0.100	0.100	
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	
Rate per kg = (a+b+c+d+e)							

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
17.06 2800		<p>Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.</p> <p>Unit = sqm</p> <p>Taking output = 10 sqm for an average thickness of 25mm.</p>					
		a) Labour					
		Mate	day	0.080	0.080	0.080	
		Mazdoor (Skilled)	day	0.998	0.998	0.998	
		Mazdoor	day	0.998	0.998	0.998	
		b) Material					
		Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter including 5 Percent wastage.	kg	315.000	315.000	315.000	
		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		<p>Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.</p> <p>Unit = kg</p> <p>Taking output = 1 kg</p>					
		a) Material					
		Epoxy including 10 Percent wastage	kg	1.100	1.100	1.100	
		b) Labour					
		Mate	day	0.011	0.011	0.011	
		Mazdoor (Skilled)	day	0.133	0.133	0.133	
		Mazdoor	day	0.133	0.133	0.133	
		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)					

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																													
				Large	Medium	Small																														
17.08	2804	<p>Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification</p> <p>Unit = sqm</p> <p>Taking output = 10 sqm</p> <p>Assume average 10mm thickness of epoxy mortar</p> <p>a) Material</p> <table> <tr> <td>Epoxy resin-hardener mix for prime coat</td> <td>kg</td> <td>2.500</td> <td>2.500</td> <td>2.500</td> </tr> <tr> <td>Epoxy mortar</td> <td>kg</td> <td>2.200</td> <td>2.200</td> <td>2.200</td> </tr> <tr> <td>Epoxy resin -hardener mix for seal coat.</td> <td>kg</td> <td>2.000</td> <td>2.000</td> <td>2.000</td> </tr> </table> <p>Add 3 Percent cost of material for other consumables like acetone etc and to cover wastage.</p> <p>b) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.053</td> <td>0.053</td> <td>0.053</td> </tr> <tr> <td>Mazdoor (Skilled)</td> <td>day</td> <td>0.665</td> <td>0.665</td> <td>0.665</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>0.665</td> <td>0.665</td> <td>0.665</td> </tr> </table> <p>c) Overhead charges</p> <p>d) Contractor's profit</p>	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	Mate	day	0.053	0.053	0.053	Mazdoor (Skilled)	day	0.665	0.665	0.665	Mazdoor	day	0.665	0.665	0.665				
Epoxy resin-hardener mix for prime coat	kg	2.500	2.500	2.500																																
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Mazdoor (Skilled)	day	0.665	0.665	0.665																																
Mazdoor	day	0.665	0.665	0.665																																
		Cost for 10 sqm = a+b+c+d																																		
		Rate per sqm = (a+b+c+d)/10																																		
17.09	2807	<p>Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.</p> <p>unit: sqm</p> <p>Taking output = 10 sqm</p> <p><i>40 mm average thickness.</i></p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.053</td> <td>0.053</td> <td>0.053</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>0.665</td> <td>0.665</td> <td>0.665</td> </tr> <tr> <td>Mazdoor (Skilled)</td> <td>day</td> <td>0.665</td> <td>0.665</td> <td>0.665</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Air compressor 250 cfm</td> <td>hour</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>Shotcreteing equipment</td> <td>hour</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> </table>	Mate	day	0.053	0.053	0.053	Mazdoor	day	0.665	0.665	0.665	Mazdoor (Skilled)	day	0.665	0.665	0.665	Air compressor 250 cfm	hour	1.000	1.000	1.000	Shotcreteing equipment	hour	1.000	1.000	1.000									
Mate	day	0.053	0.053	0.053																																
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Air compressor 250 cfm	hour	1.000	1.000	1.000																																
Shotcreteing equipment	hour	1.000	1.000	1.000																																

CHAPTER: 17- REPAIR AND REHABILITATION

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	0.053	0.053	0.053
Mazdoor (Skilled)	day	0.665	0.665	0.665
Mazdoor	day	0.665	0.665	0.665

c) **Overhead charges**

@ on
(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	0.053	0.053	0.053
Mazdoor (Skilled)	day	0.665	0.665	0.665
Mazdoor	day	0.665	0.665	0.665

CHAPTER: 17- REPAIR AND REHABILITATION

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

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

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

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

17.12 2812 Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification

Span assumed: 25 m

No. of cables: 4 no.

No. of anchorages : 8 no.

Unit = MT

Taking output = 1 MT

Assume 12.7mm dia. Strand in 12T13 system. Weight-9.42 kg/m of cable.

a) Material

HTS strand including 5 Percent wastage and extra length for jacking	tonne	1.050	1.050	1.050
HDPE pipes 75mm dia including 5 Percent wastage	metre	112.000	112.000	112.000
Cement for grouting	kg	400.000	400.000	400.000
Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.000	8.000	8.000
Epoxy	kg	6.000	6.000	6.000
MS plates for deviator (where deviator blocks are not provided)	tonne	2.100	2.100	2.100
Add 20 Percent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				

b) Labour

i) For making holes in the structure.

Mate	day	0.319	0.319	0.319
Mazdoor Semi-skilled)	day	3.990	3.990	3.990
Mazdoor	day	3.990	3.990	3.990

ii) For making and fixing anchorages for cables and placement of cables.

Mate	day	0.585	0.585	0.585
Blacksmith	day	3.990	3.990	3.990
Mazdoor	day	10.640	10.640	10.640

iii) For prestressing

Mate/Supervisor	day	0.178	0.178	0.178
Fitter	day	0.931	0.931	0.931
Mazdoor	day	3.525	3.525	3.525

iv) For grouting

Mate/Supervisor	day	0.178	0.178	0.178
Mason	day	0.931	0.931	0.931

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		Mazdoor	day	3.525	3.525	3.525	
c)	Machinery						
		Stressing jack with pump	hour	4.000	4.000	4.000	
		Grouting pump with agitator	hour	1.350	1.350	1.350	
d)	Overhead charges			@ on (a+b+c)	@ on (a+b+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 prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification

Span assumed: 50 m

No. of cables: 4 no.

No. of anchorages : 8 no.

Unit = MT

Taking output = 3.10 MT

Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.

a) Material

HTS strand including 5 Percent wastage and extra length for jacking	tonne	3.100	3.100	3.100
HDPE pipes 90mm dia including 5 Percent wastage	metre	224.000	224.000	224.000
Cement for grouting	tonne	1.010	1.010	1.010
Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.000	8.000	8.000
Epoxy	kg	10.000	10.000	10.000
MS plates for deviator (where deviator blocks are not provided)	tonne	7.000	7.000	7.000
Add 20 Percent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				

b) Labour

i) For making holes in the structure.

Mate	day	0.080	0.080	0.080
Mazdoor Semi-skilled)	day	10.640	10.640	10.640
Mazdoor	day	10.640	10.640	10.640

ii) For making and fixing anchorages for cables and placement of cables.

Mate	day	1.702	1.702	1.702
Blacksmith	day	9.310	9.310	9.310
Mazdoor	day	33.250	33.250	33.250

iii) For prestressing

Mate/Supervisor	day	0.266	0.266	0.266
Fitter	day	1.330	1.330	1.330
Mazdoor	day	5.320	5.320	5.320

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
iv) For grouting							
Mate/Supervisor			day	0.346	0.346	0.346	
Mason			day	1.995	1.995	1.995	
Mazdoor			day	6.650	6.650	6.650	
c) Machinery							
Stressing jack with pump			hour	7.000	7.000	7.000	
Grouting pump with agitator			hour	3.000	3.000	3.000	
d) Overhead charges				@ on (a+b+c)	@ on (a+b+c)	@ on (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 prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification

Span assumed: 100 m

No. of cables: 6 no.

No. of anchorages : 12 no.

Unit = MT

Taking output = 9.28 MT

Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.

a) Material

HTS strand including 5 Percent wastage and extra length for jacking	tonne	9.280	9.280	9.280
HDPE pipes 90 mm dia including 5 Percent wastage	metre	672.000	672.000	672.000
Cement for grouting	tonne	3.040	3.040	3.040
Tube anchorage set complete with bearing plate, permanent wedges etc	each	12.000	12.000	12.000
Epoxy	kg	14.000	14.000	14.000
MS plates for deviator (where deviator blocks are not provided)	tonne	20.000	20.000	20.000
Add 20 Percent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				

b) Labour

i) For making holes in the structure.

Mate	day	2.288	2.288	2.288
Mazdoor Semi-skilled)	day	23.940	23.940	23.940
Mazdoor	day	33.250	33.250	33.250

ii) For making and fixing anchorages for cables and placement of cables.

Mate	day	5.320	5.320	5.320
Blacksmith	day	26.600	26.600	26.600
Mazdoor	day	106.400	106.400	106.400

CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
iii) For prestressing							
	Mate/Supervisor		day	0.399	0.399	0.399	
	Fitter		day	1.995	1.995	1.995	
	Mazdoor		day	7.980	7.980	7.980	
iv) For grouting							
	Mate/Supervisor		day	1.330	1.330	1.330	
	Mason		day	6.650	6.650	6.650	
	Mazdoor		day	26.600	26.600	26.600	
c) Machinery							
	Stressing jack with pump		hour	10.000	10.000	10.000	
	Grouting pump with agitator		hour	10.000	10.000	10.000	
d) Overhead charges				@ on (a+b+c)	@ on (a+b+c)	@ on (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 = Number

Taking output = 3 No.

Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30m.

a) Labour

Mate	day	0.851	0.851	0.851
Mazdoor (Skilled)	day	5.320	5.320	5.320
Mazdoor	day	15.960	15.960	15.960

b) Machinery

i) Hire charges for jack of 40 tonne lifting capacity. (Lifting of span)	Day	3.000	3.000	3.000
--	-----	-------	-------	-------

c) Material

Wooden packing	cum	0.150	0.150	0.150
Cost of bearing. (Replacement of bearing)	each	3.000	3.000	3.000

d) Overhead charges

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

Taking output = 3 No.

Lifting of superstructure span by jacking up from below i.e. by placing the jacks

CHAPTER: 17- REPAIR AND REHABILITATION

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

**on pier/abutment caps for span length
of 30m.**

a) Labour

Mate	day	0.851	0.851	0.851
Mazdoor (Skilled)	day	5.320	5.320	5.320
Mazdoor	day	15.960	15.960	15.960

b) Machinery

i) Hire charges for jack of 40 tonne lifting capacity.	each	3.000	3.000	3.000
--	------	-------	-------	-------

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 is on the same side of the span.

17.17

**Replacement of Expansion Joints
complete as per drawings**

Unit - RM

Taking output = 12 RM

a) Material

Epoxy for bonding new concrete to old concrete @ 0.8 kg/sqm	kg	9.600	9.600	9.600
---	----	-------	-------	-------

M-30 grade cement concrete excluding OH & CP (Rate taken from items 14.01 C (i) (p))	cum	3.600	3.600	3.600
--	-----	-------	-------	-------

b) Labour

Removal of old expansion joint including breaking of concrete, cutting of lugs and shifting of broken material etc.

Mate	day	0.346	0.346	0.346
Mazdoor	day	7.980	7.980	7.980
Mazdoor (Skilled)	day	0.665	0.665	0.665

c) Overhead charges

	@ on (a+b)	@ 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.

CHAPTER: 17- REPAIR AND REHABILITATION

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

17.18 Replacement of Damaged Concrete Railing.

Unit = RM

Taking output = 10 RM

a) Labour

Labour for dismantling old railing and disposal of dismantled material.

Mate	day	0.266	0.266	0.266
Mazdoor	day	6.650	6.650	6.650

b) Machinery

Tractor-trolley for disposal of dismantled material	hour	1.000	1.000	1.000
---	------	-------	-------	-------

c) Overhead charges

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

d) Contractor's profit

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

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

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

Note The rate for the provision of new railing may be adopted from the chapter on superstructure.

17.19 Replacement of Crash Barrier.

Unit = RM

Taking output = 10 M

a) Labour

Labour for dismantling old railing and disposal of dismantled material.

Mate	day	0.532	0.532	0.532
Mazdoor	day	13.300	13.300	13.300

b) Machinery

Tractor-trolley for disposal of dismantled material	hour	1.000	1.000	1.000
---	------	-------	-------	-------

c) Overhead charges

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

d) Contractor's profit

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

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

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

Note The rate for the construction of new crash barrier may be adopted from chapter 8 on Traffic and Transportation.

17.20 Replacement of Damaged Mild Steel

Railing

Unit = RM

Taking output = 10 M

a) Labour

Labour for dismantling old railing and disposal of dismantled material.

Mate	day	0.213	0.213	0.213
Mazdoor	day	5.320	5.320	5.320

CHAPTER: 17- REPAIR AND REHABILITATION

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

b) Machinery	Tractor-trolley for disposal of dismantled material	hour	1.000	1.000	1.000
c) Overhead charges		@ on (a+b)	@ on (a+b)	@ on (a+b)	
d) Contractor's profit		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
Cost for 10 m = a+b+c+d					
Rate per metre = (a+b+c+d)/10					

17.21

Repair of Crash Barrier

Repair of concrete crash barrier with cement concrete of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work.

Unit = Running meter

Taking output = 10 M.

It is assumed that damage is to the extent of 10 percent of the volume of concrete .This will require 0.30 cum of concrete.

a) Manpower*

Mate	day	0.053	0.053	0.053
Mazdoor	day	1.330	1.330	1.330

* For dismantling and trimming the surface to a regular shape and removal of damaged material.

b) Material

M-30 grade cement concrete excluding OH & CP (Rate taken from items 14.01 C (i) (p)	cum	0.300	0.300	0.300
This may be priced based on the rate given the chapter of superstructure.				

c) Overhead charges

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

d) Contractor's profit

@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
Cost for 10 m = a+b+c+d		
Rate per m = (a+b+c+d)/10		

17.22

Repair of RCC Railing

Carrying out repair of RCC M30 railing to bring it to the original shape.

Unit = Running meter

Taking output = 10 M.

It is assumed that damage is to the extent of 10 Percent

a) Material

M-30 grade cement concrete excluding OH & CP (Rate taken from	cum	0.100	0.100	0.100
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CHAPTER: 17- REPAIR AND REHABILITATION

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		items 14.01 C (i) (p) HYSD bar reinforcement Rate as per item No 14.02(Excluding OH & CP)	tonne	0.013	0.013	0.013	
	b) Labour*	Mate mazdoor	day day	0.011 0.266	0.011 0.266	0.011 0.266	
	*	For dismantling and trimming the surface to a regular shape and removal of damaged material.					
	c) Overhead charges			@ on (a+b)	@ on (a+b)	@ on (a+b)	
	d) Contractor's profit			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
		Cost for 10 m = a+b+c+d Rate per m = (a+b+c+d)/10					

17.23

Repair of Steel Railing

Repair of steel railing to bring it to the original shape

It is assumed that the damage to the steel railing is to the extent of 10 Percent.

Unit = Running meter

Taking output = 10 M.

a) Material

Mild steel ISMC series	kg	29.000	29.000	29.000
Flat iron	kg	10.000	10.000	10.000
MS Bolt and nuts	kg	1.000	1.000	1.000

Add 5 Percent of cost of material for painting.

b) Labour

Mate	day	0.021	0.021	0.021
Mazdoor (Skilled)	day	0.266	0.266	0.266
Mazdoor	day	0.266	0.266	0.266

c) Overhead charges

@ on
(a+b)

d) Contractor's profit

@ on
(a+b+c)

@ on
(a+b+c)

@ on
(a+b+c)

Cost of repair for 10 m = a+b+c+d

Cost of meter = (a+b+c+d)/10

17.24

Mobile Bridge Inspection Unit (MBIU)

Inspection of bridge by using of Mobile Bridge Inspection Unit (MBIU)

Unit = Km

Taking output = 50 Km

a) Labour

Mate	day	1.360	1.360	1.360
Mazdoor (skilled)	day	34.000	34.000	34.000
Mazdoor	day	34.000	34.000	34.000

b) Machinery

Mobile Bridge Inspection Unit (MBIU)	hour	266.667	266.667	266.667
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Mobile Bridge Inspection Unit (MBIU) Mobilization &	hour	15.000	15.000	15.000
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CHAPTER: 17- REPAIR AND REHABILITATION

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

demobilization

Add 1 Percent of cost of a+b for

Miscellaneous work

c) Overhead charges

@ on

(a+b)

@ 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.

C. TUNNEL WORKS

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

Basic Inputs

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

Plants and Equipment

In the analysis of rates, for any items of work, capacity of. Equipment with corresponding output has been indicated which is most common in use for estimation purpose. Seeing the volume of job, different capacity equipment with corresponding output as indicated in Chapter-20 can be provided for preparing the estimate.

Materials

The rates of material should include basic cost at crushing units, cost of carriage including loading and unloading and stacking of material at site of work and shall be determined through market enquiries.

Labour

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

One mate has been provided for 25 labours.

Carriage of Materials

The unit for vehicle for carriage has been taken as under:

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

General :

Most of tunnels works in India is constructed / under construction using NATM technology and Rate has been analysed using the same. However, analysis of rate for tunnel construction with TBM will be incorporated in future.

Various items for tunnel work i.e. firefighting, ventilation, tunnel lighting, safety items etc. has been included in this Chapter.

The testing of materials and finished items of work is covered under overhead charges.

The Standard Data Book is for Department use only. It cannot be produced in Court of law as references/ authority and this is a privilege document.

CHAPTER – 18

TUNNEL WORK

PREAMBLES:

- 1 For drilling, pneumatically and hydraulically powered method is considered.
- 2 The excavated materials suitable for construction shall be stockpiled at approved locations otherwise it should be dumped at the approved disposal location.
- 3 Cement Grouting has been also considered to prevent the seepage of water from the side wall of the tunnel. The grout mix shall have low or no bleedability and low shrinkage characteristics. Guniting to sides and arch of tunnel with cement mortar 1:3 proportion by weight is also considered for analysis.
- 4 Two types of material for shotcrete i.e. welded wire mesh and fiber reinforced micro silica has been considered.
- 5 Rock bolting, steel support and lining items are considered for analysis.
- 6 Permanent structural steel supports i.e. lattice girder has been also consider for analysis.
- 7 The basic rates are inclusive of scaling loose material, removal of under-cuts, cleaning bed and lighting and ventilation inside tunnel during construction.
- 8 The items related to road works, drain, footpath, crash barrier, railing, kerb etc. of tunnel is covered under relevant Chapters. But overhead charges are applicable for tunnel work.
- 9 The basic rates are exclusive of cost of dewatering. Separate provision shall be made in the estimate for dewatering.
- 10 The rate for lighting, ventilation and firefighting items are required to be ascertained from the market, this being a commercially produced item by specialized firms.

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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18.01 304 Excavation in Ordinary Rock using Hydraulic Excavator and Tippers with Disposal upto 1000 meters.

Excavation for Portal in Ordinary Rock with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and disposal of excavated materials including all lifts and lead upto 1000m

Unit = cum

Taking output = 60 cum

a) Labour

Mate	day	0.053
Mazdoor	day	1.330

b) Machinery

Excavator 1.1 cum bucket capacity	hour	9.778
Jack Hammer	hour	9.778
Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	cum	72.000
Tipper 10 cum capacity for transportation to dumping yard considering lead @ 1km	t-km	120.000

c) Overhead charges @ on (a+b)

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

Cost for 60 cum = a+b+c+d

Rate per cum = (a+b+c+d)/60

18.02 303 & 304 Excavation in Hard Rock (blasting prohibited)

Excavation for Portal in Hard Rock (blasting prohibited) with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and disposal of excavated materials including all lifts and lead upto 1000m

Unit = cum

Taking output =50 cum

a) Labour

Mate	day	0.053
Mazdoor	day	1.330

b) Machinery

Excavator 1.1 cum bucket capacity	hour	11.951
Jack Hammer	hour	11.951
Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	cum	60.000
Tipper 10 cum capacity for transportation to dumping yard considering lead @ 1km	t-km	100.000
Credit for excavated rock found suitable for use @ 50 Percent of excavated quantity	cum	30.000

c) Overhead charges @ on (a+b)

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

Cost for 50 cum = a+b+c+d

Rate per cum = (a+b+c+d)/50

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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18.03 303 Excavation in Soil using Hydraulic Excavator and Tippers with Disposal upto 1000 meters.

Excavation for portal in soil with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and disposal of excavated materials including all lifts and lead upto 1000m

Unit = cum

Taking output =350 cum

a) Labour

Mate	day	0.053
Mazdoor	day	1.330

b) Machinery

Excavator 1.1 cum bucket capacity	hour	5.981
Loading & unloading charges for disposed of grabbed material (Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	hour	5.981
Tipper 10 cum capacity for transportation to dumping yard considering lead @ 1km	t-km	525.000

c) Overhead charges @ on (a+b)

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

Cost for 350 cum = a+b+c+d

Rate per cum = (a+b+c+d)/350

18.04

Drill steel with Drill jumbo

Excavation for tunnel by using drilling & blasting methods in all types of rock including cost of all materials, machinery, labour, scaling excavated surface, marking, ventilation, lighting, drainage, removing and hauling the excavated muck outside tunnel upto specified dump area and all other ancillary operations etc.

Unit = cum

Taking output =480 Cum

a) Labour

Mate	day	0.426
Mazdoor	day	7.980
Mazdoor (Skilled)	day	2.660

b) Machinery

Three boom Hydraulic Drill Jumbo	hour	25.067
Excavator for Scaling	hour	2.000
Tipper 10 cum capacity for transportation	tonne.km	480 x 2 x L
Loading & unloading charges(Using by 10 cum capacity Tipper & 1 Cum capacity Loader)	cum	576.000
Dozer (175 HP)	hour	9.600

c) Materials

Explosives	Kg	576.000
Delay Detonators	Nos.	228.000
Electric Detonators	Nos.	35.000
Detonation fuse coil	Meter	50.000
3.7 m long extension rod	Nos	1.043

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Drifter rod	Nos	0.505	
		R32 shank adapter	Nos	1.043	
		45 mm Button Bit	Nos	3.692	
		Add 10 Percent of cost of a+b+c towards Other consumable petty stores such as blasting batteries, galvanometers and sharpening charges of bit etc.			
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 480 cum = a+b+c+d+e			
		Rate per cum = (a+b+c+d+e)/480			
18.05	304	Dewatering tunnel by pumping out water collected by natural drainage inside tunnel including Dewatering in tunnel by pumping out water collected by natural drainage inside tunnel including providing sump wherever necessary, cost of all materials, machinery, labour, drainage and all other ancillary operations etc.complete.			
		Unit = Hour			
		Taking output = 20000 Hour			
		a) Labour			
		Mate	day	133.000	
		Mazdoor	day	3325.000	
		b) Machinery			
		Water Pump 10 HP	hour	20000.000	
		c) Materials			
		GI Pipe 100 mm Dia	Meter	500.000	
		Flange	Kg.	41.667	
		Nut & Bolt	Kg.	133.333	
		Bracket	Kg.	1125.000	
		Credit for salvage value of GI Pipe @ 30 Percent	Meter	150.000	
		d) Overhead charges @ on (a+b+c)			
		e) Contractor's profit @ on (a+b+c+d)			
		Cost for 20000 hour = a+b+c+d+e			
		Rate per hour = (a+b+c+d+e)/20000			
18.06		Providing , Fitting and Placing of Ribs Providing, Fitting and Placing of Ribs including Fabrication, Erection, Temporary fixture, Handling of material inside fabrication workshop, final matching, field welding and complete as per Drawing and Technical Specifications.			
		Unit = Tonne			
		Taking output = 26 Tonne			
		a) Labour			
		Mate	day	1.064	
		Mazdoor	day	13.300	
		Mazdoor(Semi Skilled)	day	6.650	
		Welder	day	6.650	
		b) Machinery			
		Rotating Telehandlers	hour	37.180	
		c) Materials			
		ISMB 350 (Including 0.25% Wastage)	Tonne	20.732	

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		MS Channel ISMC 75 (Including 0.25% Wastage)	Tonne	3.830	
		MS Plate 200 x 200 x 12 mm (Including 0.25% Wastage)	Tonne	1.504	
		Nuts and bolts (M 16X40)	Kg	151.200	
		Add 40 Percent of cost of a+b+c towards of Fabrication Erection, Temporary fixture, Handling of material, final matching and field welding etc.			
	d)	Overhead charges @ on (a+b+c)			
	e)	Contractor's profit @ on (a+b+c+d)			
		Cost for 26 Tonne = a+b+c+d+e			
		Rate per Tonne = (a+b+c+d+e)/26			
18.07	2807	Shotcreting with Steel fiber reinforced micro silica shotcrete (SFRS)			
		Shotcreting to upper bench / lower bench with steel fiber reinforced shotcrete (SFRS), shotcrete compressive strength shall be 25 N/mm ² and complete as per Drawing and Technical Specifications.			
		Unit = cum			
		Taking output =120 Cum			
	a)	Labour			
		Mate	day	0.426	
		Mazdoor	day	10.640	
	b)	Machinery			
		Batching Plant of capacity 120 cum/hour	hour	1.429	
		Generator 250 KVA	hour	1.429	
		Loader 3.1 cum capacity	hour	1.429	
		Transit truck agitator			
		For transportation (6 cum Capacity)	tonne.km	300 x L	
		For loading & unloading	hour	11.429	
		Shotcrete Machine @ 12 cum/hour	hour	10.000	
		Compressor 500 cfm	hour	10.000	
	c)	Materials			
		Cement	Tonne	49.440	
		Sand	Cum	86.850	
		10 mm to 4.76 mm Aggregate	Cum	52.080	
		Steel Fiber	Tonne	6.120	
		Admixture @ 0.4 % of Cement	Kg	197.760	
		Micro silica @ 6 % of Cement	Kg	2966.400	
		Accelerator @ 4.5 % of Cement	Kg	2224.800	
		Add 20 Percent of cost of a+b+c for Wastage due to rebound.			
	d)	Overhead charges @ on (a+b+c)			
	e)	Contractor's profit @ on (a+b+c+d)			
		Cost for 120 Cum = a+b+c+d+e			
		Rate per Cum = (a+b+c+d+e)/120			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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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/mm ² and complete as per Drawing and Technical Specifications. Unit = cum Taking output =120 Cum			
		a) Labour			
		Mate	day	0.426	
		Mazdoor	day	10.640	
		b) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	1.429	
		Generator 250 KVA	hour	1.429	
		Loader 3.1 cum capacity	hour	1.429	
		Transit truck agitator			
		For transportation (6 cum Capacity)	tonne.km	300 x L	
		For loading & unloading	hour	11.429	
		Shotcrete Machine @ 12 cum/hour	hour	10.000	
		Compressor 500 cfm	hour	10.000	
		c) Materials			
		Cement	Tonne	49.440	
		Sand	Cum	86.850	
		10 mm to 4.76 mm Aggregate	Cum	52.080	
		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.
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Unit = Number			
Taking output =155 Nos.			
a) Labour			
Mate	day	0.638	
Mazdoor	day	10.640	
Mason (IIInd class)	day	5.320	
b) Machinery			
Single boom Hydraulic Drill Jumbo	hour	25.833	

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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c) Materials

3.7 m long extension rod	Nos	1.011
R32 shank adapter	Nos	1.011
45 mm dia cross bit	Nos	3.577
25 mm Tor Steel (Including 2.5% Wastage)	Tonne	1.927
Add 15 Percent of cost of a+b+c towards cutting ,making tip, Threading, nut , plate, grouting and bit sharpening etc..		

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

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

Cost for 155 Nos = a+b+c+d+e

Rate per Number = (a+b+c+d+e)/155

18.10 2806 & 3200

Providing and fixing 32 mm diameter 7 meter long steel rock bolts including drilling 51 mm dia holes, plate, nuts, cement grout, cost of all materials, machinery, labour, ventilation, lighting, drainage and all other ancillary operations etc. complete as per Drawing and Technical Specifications.

Unit = Number

Taking output =70 Nos.

a) Labour

Mate	day	0.798
Mazdoor	day	13.300
Mason (IIInd class)	day	6.650

b) Machinery

Single Boom Hydraulic	hour	17.500
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c) Materials

3.7 m long extension rod	Nos	1.065
R32 shank adapter	Nos	1.065
32 mm coupling sleeve	Nos	1.065
51 mm dia button bit	Nos	3.769
32 mm Tor Steel (Including 2.5% Wastage)	Tonne	3.237
Add 15 Percent of cost of a+b+c towards cutting ,making tip, Threading, nut , plate, grouting and bit sharpening etc..		

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

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

Cost for 70 Nos = a+b+c+d+e

Rate per Number = (a+b+c+d+e)/70

18.11 2806

Grouting with Cement

Grouting cement slurry in grout holes under specified pressure for consolidation / contact grouting including cost of all materials, machinery, labour, predrilling wherever necessary, ventilation, lighting, drainage and other ancillary operations etc. complete as per Drawing and Technical Specifications.

Unit = Tonne

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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Taking output = 1.5 Tonne

a) Labour

Mate	day	0.106
Mazdoor	day	2.660

b) Machinery

Grouting machine @ 25 Bags Per Hours	hour	1.200
Pump 10 HP	hour	1.200
Single Boom Hydraulic	hour	1.250

c) Materials

Cement Including 1% Wastage)	Tonne	1.515
Cost of water (Water/Cement Ratio - 0.4)	KL	0.606
3.7 m long extension rod	Nos	0.076
R32 shank adapter	Nos	0.076
32 mm coupling sleeve	Nos	0.076
51 mm dia cross bit	Nos	0.269

Add 5 Percent of cost of a+b+c towards cutting,
making tip, Threading, nut , plate, grouting and bit
sharpening etc..

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

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

Cost for 1.5 Tonne = a+b+c+d+e

Rate per Tonne = (a+b+c+d+e)/1.5

18.12 1700 Furnishing and Placing Reinforced cement concrete in Tunnel Work as per drawing and Technical Specification

18.12 1700 A RCC Grade M20

Using Batching Plant, Transit Mixer and Concrete Pump

Unit = Cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.05)	cum	120.000
Water for curing	KL	63.000

b) Labour

For pouring and placing

Mate	day	0.317
Mason	day	1.995
Mazdoor	day	5.922

c) Machinery

Transit truck agitator

For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1
For unloading	hour	2.905

Hydraulic Boom placer pump

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)

(i) 12 KL capacity	hour	1.167 x L1 + 3.5
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d) Formwork and staging 40 Percent of (a+b+c)

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

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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g) Contractor's profit @ on (a+b+c+d+e)

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

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

18.12	1700	B	RCC Grade M25		
Using Batching Plant, Transit Mixer and Concrete Pump					
Unit = Cum					
Taking output = 120 cum					
a) Material					
Per Cum Basic Cost (Rate taken from sub-analysis -21.07)				cum	120.000
Water for curing				Kl	63.000
b) Labour					
For pouring and placing					
Mate				day	0.317
Mason				day	1.995
Mazdoor				day	5.922
c) Machinery					
Transit truck agitator					
For transportation (6 cum Capacity) , L1 - lead in Kilometer				tonne-km	300 x L1
For unloading				hour	2.905
Hydraulic Boom placer pump				hour	2.905
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
(i) 12 KL capacity				hour	1.167 x L1 + 3.5
d) Formwork and staging 40 Percent of (a+b+c)					
e) Overhead charges @ on (a+b+c+d)					
f) Contractor's profit @ on (a+b+c+d+e)					

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

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

18.12	1700	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 (Rate taken from sub-analysis -21.09)				cum	120.000
Water for curing				Kl	63.000
b) Labour					
For pouring and placing					
Mate				day	0.317
Mason				day	1.995
Mazdoor				day	5.922
c) Machinery					
Transit truck agitator					
For transportation (6 cum Capacity) , L1 - lead in Kilometer				tonne-km	300 x L1
For unloading				hour	2.905

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	D	RCC Grade M35		
		Using Batching Plant, Transit Mixer and Concrete Pump			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.11)			
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump	hour	2.905	
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)			
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	E	RCC Grade M-40		
		Using Batching Plant, Transit Mixer and Concrete Pump			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost	cum	120.000	
		(Rate taken from sub-analysis -21.12)			
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
Mason			day	1.995	
Mazdoor			day	5.922	
c) Machinery					
Transit truck agitator					
For transportation (6 cum Capacity) , L1 - lead in Kilometer			tonne-km	300 x L1	
For unloading			hour	2.905	
Hydraulic Boom placer pump			hour	2.905	
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)					
(i) 12 KL capacity			hour	1.167 x L1 + 3.5	

d) Formwork and staging 40 Percent of (a+b+c)

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

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

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

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

18.12 1700 F RCC Grade M-45

Unit = Cum

Taking output = 120 cum

a) Material

Per Cum Basic Cost (Rate taken from sub-analysis -21.13)	cum	120.000
Water for curing	KI	63.000

b) Labour

For pouring and placing		
Mate	day	0.317
Mason	day	1.995
Mazdoor	day	5.922

c) Machinery

Transit truck agitator		
For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1
For unloading	hour	2.905
Hydraulic Boom placer pump	hour	2.905
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)		
(i) 12 KL capacity	hour	1.167 x L1 + 3.5

d) Formwork and staging 40 Percent of (a+b+c)

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

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

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

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

CHAPTER: 18- TUNNEL WORK

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 (Rate taken from sub-analysis -21.14)	cum	120.000	
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump			
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	2.905	
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			
		e) Overhead charges @ on (a+b+c+d)			
		f) Contractor's profit @ on (a+b+c+d+e)			
		Cost for 120 cum = a+b+c+d+e+f			
		Rate per cum = (a+b+c+d+e+f)/120			
18.12	1700	H RCC Grade M- 55			
		Unit = Cum			
		Taking output = 120 cum			
		a) Material			
		Per Cum Basic Cost (Rate taken from sub-analysis -21.15)	cum	120.000	
		Water for curing	Kl	63.000	
		b) Labour			
		For pouring and placing			
		Mate	day	0.317	
		Mason	day	1.995	
		Mazdoor	day	5.922	
		c) Machinery			
		Transit truck agitator			
		For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1	
		For unloading	hour	2.905	
		Hydraulic Boom placer pump			
		Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	2.905	
		(i) 12 KL capacity	hour	1.167 x L1 + 3.5	
		d) Formwork and staging 40 Percent of (a+b+c)			

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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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 (Rate taken from sub-analysis -21.16)	cum	120.000
Water for curing	Kl	63.000

b) Labour

For pouring and placing		
Mate	day	0.317
Mason	day	1.995
Mazdoor	day	5.922

c) Machinery

Transit truck agitator		
For transportation (6 cum Capacity) , L1- lead in Kilometer	tonne-km	300 x L1
For unloading	hour	2.905
Hydraulic Boom placer pump	hour	2.905
Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)		
(i) 12 KL capacity	hour	1.167 x L1 + 3.5

d) Formwork and staging 40 percent of (a+b+c)

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

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

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

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

18.12 1700 J RCC 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
Water for curing	Kl	63.000

b) Labour

For pouring and placing		
Mate	day	0.317
Mason	day	1.995
Mazdoor	day	5.922

c) Machinery

Transit truck agitator		
For transportation (6 cum Capacity) , L1 - lead in Kilometer	tonne-km	300 x L1
For unloading	hour	2.905
Hydraulic Boom placer pump	hour	2.905

CHAPTER: 18- TUNNEL WORK

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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18.13	1600	Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)	hour	1.167 x L1 + 3.5		
		(i) 12 KL capacity				
		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				
Supplying, fitting and placing HYSD bar reinforcement in Tunnel Work complete as per drawing and technical specifications						
Unit = MT						
Taking output = 8 MT						
a) Material						
MS bars including 5 Percent overlaps and wastage		tonne	8.400			
Binding wire		Kg	48.000			
b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position						
Mate		day	0.213			
Blacksmith		day	1.330			
Mazdoor		day	3.990			
c) Machinery						
Cutting Machine		hour	8.000			
Bending Machine		hour	8.000			
Electric generator 15 KVA		hour	8.000			
Tipper						
Tipper for Transportation						
(i) 14 cum capacity		t.km	8 x L1			
Loading & Unloading Time		hour				
(i) 14 cum capacity		hour	2.000			
Light weight Crane						
At cutting bending yard		hour	2.000			
At site		hour	2.000			
d) Overhead charges @ on (a+b+c)						
e) Contractor's profit @ on (a+b+c+d)						
Cost for 8 MT (a+b+c+d+e)						
Rate for per MT (a+b+c+d+e)/8						

CHAPTER – 19
ENVIRONMENTAL MANAGEMENT & BIO ENGINEERING

PREAMBLE:

1. The items of Bio-Engineering comprising Bamboo crib wall, Fascines, Brush Layers, Palisades in Rills & Slopes, Seeding and Mulching have been included in the chapter to stabilize hill slopes.
2. Seeding and mulching has been included as earth work to stabilize the cut and fill slope in plane
3. To attenuate the environmental pollution generated during construction and operation stage, three type of preventive measures have been provided
 - a) Dust suppression
 - b) Noise Barrier
 - c) Silt fencing

The selection of the attenuation factor will be based on site situation and the sensitive receptors.

4. The analysis of rates for Environmental Monitoring – Air, Water, Noise & Soil has been included to cater with the compliance submission to SPCB & MoEF&CC.
5. The rates for consent approval from SPCB & CPCB for Consent to Establish (CtE) and Consent to Operate (CtO) for setting of Plant has been estimate and considered.
6. The cost of Environment and Social Workshops to create awareness to the locals, NGOs, etc. has been evaluated.
7. The estimates for compensatory afforestation though proposed by the forest authority and those planted in the median by contractor has been analysed and included in rate list.
8. The overhead charges will be applicable of Road Works for this chapter.
9. The cost of maintenance for plantation has been considered and included for the purpose of estimation.

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

19.01 Suggestive

Noise Barriers

(i) **Masonry wall**

Unit = cum

Taking output = 5 Cum

a) **Material**

Bricks 1st class	each	2500.000	2500.000	2500.000
Cement mortar 1:3 (Rate as sub-analysis)	cum	1.200	1.200	1.200
Water for curing	KL	2.415	2.415	2.415

b) **Labour**

Mate	day	0.586	0.586	0.586
Mason	day	4.000	4.000	4.000
Mazdoor	day	10.640	10.640	10.640

c) **Machinery**

Water tanker (speed @ 10 km/hr. and return speed @ 15 km/hr. and 30 mins for unloading)

(i) 16 KL capacity	hour	0.034 x L1 + 0.101		
(ii) 12 KL capacity	hour		0.045 x L1 + 0.134	
(iii) 6 KL capacity	hour			0.089 x L1 + 0.268

d) **Overhead charges**

@ on
(a+b+c)

e) **Contractor's profit**

@ on
(a+b+c+d)

@ on
(a+b+c+d)

Cost for 5 Cum = a+b+c+d+e

Rate per Cum = (a+b+c+d+e) /5

(ii) **Galvanized steel plain sheet**

Unit = sqm

Taking output = 100 sqm

a) **Labour**

Mate	day	0.073	0.073	0.073
blacksmith	day	0.500	0.500	0.500
Mazdoor	day	1.330	1.330	1.330

b) **Material**

Galvanized steel plain sheet (5 mm) including 5% wastage	Kg	3.150	3.150	3.150
MS Angle	Kg	154.500	154.500	154.500

Add 10 Percent of cost of a+b towards of drilling , nut & bolt etc.

c) **Overhead charges**

@ on (a+b)

@ on (a+b)

@ on (a+b)

d) **Contractor's profit**

@ on (a+b+c)

@ on (a+b+c)

@ on (a+b+c)

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

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

Note :- Rate for excavation, cement concrete M-25 and painting may be taken from respective chapters

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

(iii) **Acrylic noise barrier sheet**

Unit = sqm

Taking output = 100 sqm

a) Labour

Mate	day	0.073	0.073	0.073
blacksmith	day	0.500	0.500	0.500
Mazdoor	day	1.330	1.330	1.330

b) Material

Acrylic noise barrier sheet (3 mm) including 5% wastage	Sqm	105.000	105.000	105.000
MS Angle Add 10 Percent of cost of a+b towards of drilling , nut & bolt etc..	Kg	154.500	154.500	154.500

c) Overhead charges

@ on
(a+b)

d) Contractor's profit

@ on
(a+b+c)

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

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

Note :- Rate for excavation, cement concrete M-25 and painting may be taken from respective chapters

19.02 Suggestive

Construction of bamboo crib wall complete as per drawing and additional Technical specification.

Unit = Rm

Taking output = 1 Rm

a) Labour

Mate	day	0.021	0.021	0.021
Mazdoor skilled	day	0.133	0.133	0.133
Mazdoor	day	0.399	0.399	0.399

b) Machinery

Water tanker 6 KL capacity	hour	0.008	0.008	0.008
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c) Materials

Bamboos (For Horizontal Beam)	Rm	4.000	4.000	4.000
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Live Stake Stump / Bamboos (Vertical)	Rm	1.500	1.500	1.500
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Live Stake Stump / Bamboos (Horizontal)	Rm	1.000	1.000	1.000
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Binding Material	Rm	2.000	2.000	2.000
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Cost of Water	KL	0.050	0.050	0.050
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Grass	Kg	1.500	1.500	1.500
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d) Overhead charges

@ on
(a+b+c)

e) Contractor's profit

@ 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	<p>Construction of Fascines with a bundle of sticks complete as per drawing and additional Technical specification.</p> <p>Unit = Rm</p> <p>Taking output = 10 Rm</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.133</td> <td>0.133</td> <td>0.133</td> </tr> <tr> <td>Mazdoor skilled</td> <td>day</td> <td>0.665</td> <td>0.665</td> <td>0.665</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>2.660</td> <td>2.660</td> <td>2.660</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Tractor-trolley</td> <td>hour</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> </table> <p>c) Material</p> <table> <tr> <td>Hard wood sticks</td> <td>Nr</td> <td>8.000</td> <td>8.000</td> <td>8.000</td> </tr> <tr> <td>Binding Material</td> <td>Rm</td> <td>5.000</td> <td>5.000</td> <td>5.000</td> </tr> </table> <p>d) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table> <p>e) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> </tr> </table> <p>Cost for 10 Rm = a+b+c+d+e</p> <p>Rate per Rm = (a+b+c+d+e)/ 10</p>	Mate	day	0.133	0.133	0.133	Mazdoor skilled	day	0.665	0.665	0.665	Mazdoor	day	2.660	2.660	2.660	Tractor-trolley	hour	1.000	1.000	1.000	Hard wood sticks	Nr	8.000	8.000	8.000	Binding Material	Rm	5.000	5.000	5.000		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)														
Mate	day	0.133	0.133	0.133																																																		
Mazdoor skilled	day	0.665	0.665	0.665																																																		
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Tractor-trolley	hour	1.000	1.000	1.000																																																		
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Binding Material	Rm	5.000	5.000	5.000																																																		
	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																																			
	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)																																																			
19.04	Suggestive	<p>Contraction and laying of brush Layers across the slope complete as per drawing and additional Technical specification.</p> <p>Unit = sqm</p> <p>Taking output = 100 sqm</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.160</td> <td>0.160</td> <td>0.160</td> </tr> <tr> <td>Mazdoor for preparation of ground</td> <td>day</td> <td>3.990</td> <td>3.990</td> <td>3.990</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Water tanker 6 KL capacity including watering for 3 months</td> <td>hour</td> <td>2.000</td> <td>2.000</td> <td>2.000</td> </tr> <tr> <td>Tractor-trolley</td> <td>hour</td> <td>0.500</td> <td>0.500</td> <td>0.500</td> </tr> </table> <p>c) Material</p> <table> <tr> <td>Live Sods (.6m Length)</td> <td>Nr</td> <td>1000.000</td> <td>1000.000</td> <td>1000.000</td> </tr> <tr> <td>Farm yard manure @ 0.18 cum per 100 sqm at site of work</td> <td>cum</td> <td>0.180</td> <td>0.180</td> <td>0.180</td> </tr> <tr> <td>Cost of water</td> <td>KL</td> <td>12.000</td> <td>12.000</td> <td>12.000</td> </tr> <tr> <td>Grass</td> <td>Kg</td> <td>100.000</td> <td>100.000</td> <td>100.000</td> </tr> </table> <p>d) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table> <p>e) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> </tr> </table> <p>Cost for 100 sqm = a+b+c+d+e</p> <p>Rate per sqm = (a+b+c+d+e)/ 100</p>	Mate	day	0.160	0.160	0.160	Mazdoor for preparation of ground	day	3.990	3.990	3.990	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	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		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)				
Mate	day	0.160	0.160	0.160																																																		
Mazdoor for preparation of ground	day	3.990	3.990	3.990																																																		
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																																																		
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																																																		
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	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																																			
	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)																																																			

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)																																															
				Large	Medium	Small																																																
19.05	Suggestive	<p>Construction of vegetative Palisades in Rills using hard wood cutting complete as per drawing and additional Technical specification.</p> <p>Unit = Rm</p> <p>Taking output = 2 Rm</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.019</td> <td>0.019</td> <td>0.019</td> </tr> <tr> <td>Mazdoor skilled</td> <td>day</td> <td>0.133</td> <td>0.133</td> <td>0.133</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>0.354</td> <td>0.354</td> <td>0.354</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Tractor-trolley</td> <td>hour</td> <td>0.250</td> <td>0.250</td> <td>0.250</td> </tr> </table> <p>c) Material</p> <table> <tr> <td>Horizontal Live Sods (2M Length)</td> <td>Nr</td> <td>2.000</td> <td>2.000</td> <td>2.000</td> </tr> <tr> <td>Vertical Live Sods (2 M Length)</td> <td>Nr</td> <td>40.000</td> <td>40.000</td> <td>40.000</td> </tr> <tr> <td>Cost of water</td> <td>KL</td> <td>0.100</td> <td>0.100</td> <td>0.100</td> </tr> <tr> <td>Binding Material</td> <td>Rm</td> <td>5.000</td> <td>5.000</td> <td>5.000</td> </tr> </table> <p>d) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table> <p>e) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> </tr> </table> <p>Cost for 2 M = a+b+c+d+e</p> <p>Rate per Rm = (a+b+c+d+e)/ 2</p>	Mate	day	0.019	0.019	0.019	Mazdoor skilled	day	0.133	0.133	0.133	Mazdoor	day	0.354	0.354	0.354	Tractor-trolley	hour	0.250	0.250	0.250	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		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)				
Mate	day	0.019	0.019	0.019																																																		
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	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																																																			
	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)																																																			
19.06	Suggestive	<p>Laying of Palisades in Slopes complete as per drawing and additional Technical specification.</p> <p>Unit = sqm</p> <p>Taking output = 100 sqm</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.160</td> <td>0.160</td> <td>0.160</td> </tr> <tr> <td>Mazdoor for preparation of ground</td> <td>day</td> <td>3.990</td> <td>3.990</td> <td>3.990</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Water tanker 6 kl including watering for 3 months</td> <td>hour</td> <td>2.000</td> <td>2.000</td> <td>2.000</td> </tr> <tr> <td>Tractor-trolley</td> <td>hour</td> <td>0.500</td> <td>0.500</td> <td>0.500</td> </tr> </table> <p>c) Material</p> <table> <tr> <td>Live Sods (.6m Length)</td> <td>Nr</td> <td>1000.000</td> <td>1000.000</td> <td>1000.000</td> </tr> <tr> <td>Farm yard manure @ 0.18 cum per 100 sqm at site of work</td> <td>cum</td> <td>0.180</td> <td>0.180</td> <td>0.180</td> </tr> <tr> <td>Cost of water</td> <td>KL</td> <td>12.000</td> <td>12.000</td> <td>12.000</td> </tr> <tr> <td>Grass</td> <td>Kg</td> <td>100.000</td> <td>100.000</td> <td>100.000</td> </tr> </table> <p>d) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table> <p>e) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> </tr> </table> <p>Cost for 100 sqm = a+b+c+d+e</p> <p>Rate per sqm = (a+b+c+d+e)/ 100</p>	Mate	day	0.160	0.160	0.160	Mazdoor for preparation of ground	day	3.990	3.990	3.990	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	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		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)				
Mate	day	0.160	0.160	0.160																																																		
Mazdoor for preparation of ground	day	3.990	3.990	3.990																																																		
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	@ 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																												
19.07	Suggestive	<p>Dust suppression Sprinkling of water in the settlement and working area as per instruction of Engineer.</p> <p>Unit = 6 KL</p> <p>Taking output = 6 KL</p> <p>a) Labour</p> <table> <tr> <td>Mate</td> <td>day</td> <td>0.011</td> <td>0.011</td> <td>0.011</td> </tr> <tr> <td>Mazdoor</td> <td>day</td> <td>0.266</td> <td>0.266</td> <td>0.266</td> </tr> </table> <p>b) Machinery</p> <table> <tr> <td>Water tanker 6 KL capacity</td> <td>hour</td> <td>0.750</td> <td>0.750</td> <td>0.750</td> </tr> </table> <p>c) Materials</p> <table> <tr> <td>Cost of Water</td> <td>KL</td> <td>6.000</td> <td>6.000</td> <td>6.000</td> </tr> </table> <p>d) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> <td>@ on (a+b+c)</td> </tr> </table> <p>e) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> <td>@ on (a+b+c+d)</td> </tr> </table> <p>Cost for 6 KL = a+b+c+d+e</p>	Mate	day	0.011	0.011	0.011	Mazdoor	day	0.266	0.266	0.266	Water tanker 6 KL capacity	hour	0.750	0.750	0.750	Cost of Water	KL	6.000	6.000	6.000		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)				
Mate	day	0.011	0.011	0.011																														
Mazdoor	day	0.266	0.266	0.266																														
Water tanker 6 KL capacity	hour	0.750	0.750	0.750																														
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	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)																															
	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)																															
19.08	Suggestive	<p>Water Quality Monitoring (Grab Sample as per the monitoring locations mention in the EIA/EMP report or one sample/10 km length)</p> <p>Unit = Number</p> <p>Taking output = One Number</p> <p>a) Cost of Water Quality Monitoring</p> <table> <tr> <td>Nos.</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> </table> <p>b) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a)</td> <td>@ on (a)</td> <td>@ on (a)</td> </tr> </table> <p>c) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b)</td> <td>@ on (a+b)</td> <td>@ on (a+b)</td> </tr> </table> <p>Rate per number = a+b+c</p>	Nos.	1.000	1.000	1.000		@ on (a)	@ on (a)	@ on (a)		@ on (a+b)	@ on (a+b)	@ on (a+b)																				
Nos.	1.000	1.000	1.000																															
	@ on (a)	@ on (a)	@ on (a)																															
	@ on (a+b)	@ on (a+b)	@ on (a+b)																															
19.09	Suggestive	<p>Soil Quality Monitoring (Grab Sample as per the monitoring locations mention in the EIA/EMP report or one sample/10 km length)</p> <p>Unit = Number</p> <p>Taking output = One Number</p> <p>a) Cost of Soil Quality Monitoring</p> <table> <tr> <td>Nos.</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> </table> <p>b) Overhead charges</p> <table> <tr> <td></td> <td>@ on (a)</td> <td>@ on (a)</td> <td>@ on (a)</td> </tr> </table> <p>c) Contractor's profit</p> <table> <tr> <td></td> <td>@ on (a+b)</td> <td>@ on (a+b)</td> <td>@ on (a+b)</td> </tr> </table> <p>Rate per number = a+b+c</p>	Nos.	1.000	1.000	1.000		@ on (a)	@ on (a)	@ on (a)		@ on (a+b)	@ on (a+b)	@ on (a+b)																				
Nos.	1.000	1.000	1.000																															
	@ on (a)	@ on (a)	@ on (a)																															
	@ 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	
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					
	(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					
	(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	
		(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)	@ on (a)	
		c) Contractor's profit	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per number = a+b+c					
		(ii) a) compliance submission for Consent to Operate (CTO)	Nos.	1.000	1.000	1.000	
		b) Overhead charges	@ on (a)	@ on (a)	@ on (a)	@ on (a)	
		c) Contractor's profit	@ on (a+b)	@ 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)	@ on (a)	
		c) Contractor's profit	@ on (a+b)	@ 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)	@ on (a)	
		c) Contractor's profit	@ on (a+b)	@ on (a+b)	@ on (a+b)	@ on (a+b)	
		Rate per number = a+b+c					
19.16	Suggestive	Pollution prevention Silt fencing on either side of the streams and rivers including erection and maintenance for entire construction phase. Unit = Rm Taking output = 100 Rm					
		a) Labour					
		Mate	day	0.106	0.106	0.106	
		Mazdoor	day	2.660	2.660	2.660	
		b) Machinery					
		Tractor-trolley	hour	2.000	2.000	2.000	
		c) Material					
		Silt Fence Sheet	Sqm	100.000	100.000	100.000	
		Hard wood sticks	Nos.	34.000	34.000	34.000	
		d) Overhead charges					
			@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	@ 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+vc+d)																															
		Cost for 100 Rm= a+b+c+d+e Rate per Rm = (a+b+c+d+e)/100																																			
19.17	IRC-SP-88	Road Safety Audit during Construction Period & Maintenance Period Road Safety Audit during Construction Period & Maintenance Period including collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification report, submission of GAP report, Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter report, Submission of audit report of work zone safety, workshop report and Final Safety report complete as per IRC-SP-88 and directed by engineer.																																			
Unit = Kilometer																																					
A Upto 50.00 Kilometer																																					
a) Experts/Key Personnel <table> <tr> <td>Sr. Road Safety/Auditor/ Team Leader</td> <td>Month</td> <td>4</td> <td>4</td> <td>4</td> </tr> <tr> <td>Traffic Planner</td> <td>Month</td> <td>6</td> <td>6</td> <td>6</td> </tr> </table>								Sr. Road Safety/Auditor/ Team Leader	Month	4	4	4	Traffic Planner	Month	6	6	6																				
Sr. Road Safety/Auditor/ Team Leader	Month	4	4	4																																	
Traffic Planner	Month	6	6	6																																	
b) Boarding & Loading <table> <tr> <td>Boarding & Loading and Per Diem for Site Visits.</td> <td>Days</td> <td>90.000</td> <td>90.000</td> <td>90.000</td> </tr> <tr> <td>Transportation at site and Head Office</td> <td>No. of Trip</td> <td>20.000</td> <td>20.000</td> <td>20.000</td> </tr> <tr> <td>Duty travel to Site</td> <td>Days</td> <td>90.000</td> <td>90.000</td> <td>90.000</td> </tr> </table>								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															
Boarding & Loading and Per Diem for Site Visits.	Days	90.000	90.000	90.000																																	
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c) Reports and Documents Cost <table> <tr> <td>Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification</td> <td>No. of Copies</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Submission of GAP report</td> <td>No. of Copies</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter.</td> <td>No. of Copies</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Submission of audit report of work zone safety</td> <td>No. of Copies</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>workshop report.</td> <td>No. of Copies</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Final Safety report</td> <td>No. of</td> <td>5</td> <td>5</td> <td>5</td> </tr> </table>								Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5	Submission of GAP report	No. of Copies	5	5	5	Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter.	No. of Copies	5	5	5	Submission of audit report of work zone safety	No. of Copies	5	5	5	workshop report.	No. of Copies	5	5	5	Final Safety report	No. of	5	5	5
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Final Safety report	No. of	5	5	5																																	

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

Copies

	Add 10 percent of cost of a+b+c as Miscellaneous work			
d)	Overhead charges	@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)
e)	Contractor's profit	@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)

Rate for Upto 50.00 Kilometer = (a+b+c+d+e)

B Between 50.00 Km. to 100.00 Km.

a) Experts/Key Personnel

Sr. Road Safety/Auditor/ Team Leader	Month	6	6	6
Traffic Planner	Month	8	8	8

b) Boarding & Loading

Boarding & Loading and Per Diem for Site Visits.		126.000	126.000	126.000
Transportation at site and Head Office		20.000	20.000	20.000
Duty travel to Site		126.000	126.000	126.000

c) Reports and Documents Cost

Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5
Submission of GAP report	No. of Copies	5	5	5
Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter	No. of Copies	5	5	5

Submission of audit report of work zone safety	No. of Copies	5	5	5
Workshop report.	No. of Copies	5	5	5
Final Safety report	No. of Copies	5	5	5

Add 10 percent of cost of a+b+c as Miscellaneous work

d) Overhead charges

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

e) Contractor's profit

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

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
19.17	C	More than 100 Km.					
	a)	Experts/Key Personnel					
		Sr. Road Safety/Auditor/ Team Leader	Month	8	8	8	
		Traffic Planner	Month	10	10	10	
	b)	Boarding & Loading					
		Boarding & Loading and Per Diem for Site Visits.		162.000	162.000	162.000	
		Transportation at site and Head Office		20.000	20.000	20.000	
		Duty travel to Site		162.000	162.000	162.000	
	c)	Reports and Documents Cost					
		Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification	No. of Copies	5	5	5	
		Submission of GAP report	No. of Copies	5	5	5	
		Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter.	No. of Copies	5	5	5	
		Submission of audit report of work zone safety	No. of Copies	5	5	5	
		workshop report.	No. of Copies	5	5	5	
		Final Safety report	No. of Copies	5	5	5	
		Add 1 percent of cost of a+b+c as Miscellaneous work					
	d)	Overhead charges		@ on (a+b+c)	@ on (a+b+c)	@ on (a+b+c)	
	e)	Contractor's profit		@ on (a+b+c+d)	@ on (a+b+c+d)	@ on (a+b+c+d)	

Rate for More than 100.00 Kilometer = (a+b+c+d+e)

19.18	IRC-SP-88	Road Safety Audit during Maintenance Period
		Road Safety Audit during Maintenance Period including collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification report, submission of GAP report, Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter report, submission of audit report of work zone safety (Maintenance work), workshop report and Final Safety report complete as per IRC-SP-88 and directed by engineer.

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

Unit = Kilometer

A Upto 50.00 Kilometer

a) Experts/Key Personnel

Sr. Road Safety/Auditor/ Team Leader

Month 2 2 2

Traffic Planner

Month 3 3 3

b) Boarding & Loading

Boarding & Loading and Per Diem for Site Visits.

Days 45.000 45.000 45.000

Transportation at site and Head Office

No. of Trip 20.000 20.000 20.000

Duty travel to Site

Days 45.000 45.000 45.000

c) Reports and Documents Cost

Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification

No. of Copies 5 5 5

Submission of GAP report

No. of Copies 5 5 5

Road Safety Audit Reports on all activities which were planned, actually executed and planned for the next quarter

No. of Copies 5 5 5

Submission of audit report of work zone safety (Maintenance work)

No. of Copies 5 5 5

workshop report.

No. of Copies 5 5 5

Final Safety report

No. of Copies 5 5 5

Add 10 percent of cost of a+b+c as Miscellaneous work

d) Overhead charges

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

e) Contractor's profit

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

Rate for Upto 50.00 Kilometer = (a+b+c+d+e)

B Between 50.00 Km. to 100 Km.

a) Experts/Key Personnel

Sr. Road Safety/Auditor/ Team Leader

Month 3 3 3

Traffic Planner

Month 4 4 4

b) Boarding & Loading

Boarding & Loading and Per Diem for Site Visits.

Days 45.000 45.000 45.000

Transportation at site and Head Office

No. of Trip 20.000 20.000 20.000

Duty travel to Site

Days 45.000 45.000 45.000

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
c)	Reports and Documents Cost						
	Collection of Road accident data and analysis of fatal and grievously injured accident with black spot identification		No. of Copies	5	5	5	5
	Submission of GAP report		No. of Copies	5	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	5
	Submission of audit report of work zone safety (Maintenance work)		No. of Copies	5	5	5	5
	Workshop report.		No. of Copies	5	5	5	5
	Final Safety report		No. of Copies	5	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)	@ on (a+b+c+d)
	Rate for 50.00 to 100.00 Kilometer = (a+b+c+d+e)						
C	More than 100 Km.						
a)	Experts/Key Personnel						
	Sr. Road Safety/Auditor/ Team Leader		Month	4	4	4	4
	Traffic Planner		Month	5	5	5	5
b)	Boarding & Loading						
	Boarding & Loading and Per Diem for Site Visits.		Days	45.000	45.000	45.000	45.000
	Transportation at site and Head Office		No. of Trip	20.000	20.000	20.000	20.000
	Duty travel to Site		Days	45.000	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	5
	Submission of GAP report		No. of Copies	5	5	5	5
	Road Safety Audit Reports on all activities which were planned, actually executed and planned for		No. of Copies	5	5	5	5

Sr No	Ref. to M	Description	Unit	Quantity as per project category			Rate (Rs.)
				Large	Medium	Small	
		the next quarter					
		Submission of audit report of work zone safety (Maintenance work)	No. of Copies	5	5	5	
		Workshop report.	No. of Copies	5	5	5	
		Final Safety report	No. of Copies	5	5	5	
		Add 10 percent of cost of a+b+c as Miscellaneous work					
d)	Overhead charges		@ on (a+b+c)		@ on (a+b+c)		@ on (a+b+c)
e)	Contractor's profit		@ on (a+b+c+d)		@ on (a+b+c+d)		@ on (a+b+c+d)
Rate for More than 100.00 Kilometer = (a+b+c+d+e)							

CHAPTER – 20
USAGE RATES OF PLANT AND MACHINERY

PREAMBLE:

1. The hourly owning and operating cost of equipment comprises the following elements:

a) Ownership Cost

- i) Interest on capital investment;
- ii) Insurance cost; and
- iii) Depreciation cost.
- iv) Taxes and duties: This list is just indicative

b) Operational Cost

- i) Fuel/energy and lubricants charges;
- ii) Operation and maintenance crew charges;
- iii) Repair charges; and
- iv) Miscellaneous supplies

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
1	Dozer - 240 HP	Spreading Cutting Clearing	240	Hour	6446.00
2	Dozer - 175 HP	Spreading Cutting Clearing	175	Hour	4971.00
3	Dozer - 90 HP	Spreading Cutting Clearing	90	Hour	3401.00
4	Motor Grader 4.3 metre blade	Clearing Scarifying Spreading GSB WMM	186	Hour	5991.00
5	Motor Grader 3.7 metre blade	Clearing Scarifying Spreading GSB WMM	171	Hour	5497.00
6	Motor Grader 3.35 metre blade	Clearing Scarifying Spreading GSB WMM	110	Hour	4796.00
7	Hydraulic Excavator of 1.2 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	188	Hour	3420.00
8	Hydraulic Excavator of 1.1 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	162	Hour	3074.00
9	Hydraulic Excavator of 0.9 cum bucket	Soil Ordinary Soil Marshy Soil Unsuitable	138	Hour	2782.00
10	Jack Hammer (attachment of Hydraulic Excavator)	For Drilling Purpose	-	Hour	206.00
11	Front End loader 3.1 cum bucket capacity	Soil loading Aggregate loading, etc.	221	Hour	4228.00
12	Front End loader 2.1 cum bucket capacity	Soil loading Aggregate loading, etc.	150	Hour	2618.00
13	Backhoe-loader 1 cum bucket capacity	Soil loading Aggregate loading, etc.	92	Hour	1780.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
14	Tipper-18 Cum	Transportation of Soil, GSB,WMM, Hotmix etc.	280	Hour	2845.00
15	Tipper-18 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	275	Per Tonne Km	6.10
16	Tipper-18 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	275	Per Tonne Km	14.818
17	Tipper-18 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	275	Per Tonne Km	14.82
18	Tipper-14 Cum	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Hour	2513.00
19	Tipper -14 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Per Tonne Km	6.89
20	Tipper -14 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Per Tonne Km	16.75
21	Tipper -14 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	220	Per Tonne Km	16.75
22	Tipper-10 Cum	Transportation of Soil, GSB,WMM, Hotmix etc.	178	Hour	2229.00
23	Tipper -10 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	178	Per Tonne Km	8.49
24	Tipper -10 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	178	Per Tonne Km	20.64
25	Tipper -10 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	178	Per Tonne Km	20.64
26	Tipper-5.5 Cum	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Hour	1681.00
27	Tipper- 5.5 Cum (Surface Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Per Tonne Km	11.53

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
28	Tipper- 5.5 Cum (Unsurfaced Gravelled Road)	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Per Tonne Km	28.02
29	Tipper- 5.5 Cum (Katcha Track)	Transportation of Soil, GSB,WMM, Hotmix etc.	90	Per Tonne Km	28.02
30	Vibratory Soil Compactor (10 tonne)	Earth/Soil, GSB, WMM	99	Hour	2511.00
31	Smooth Wheeled Roller 8 tonne	Soil Compaction BM Compaction	98	Hour	2038.00
32	Tandem Roller	Rolling of Asphalt Surface	99	Hour	2501.00
33	Mini Tandem Roller	Earth/Soil	44	Hour	1401.00
34	Pneumatic Road Roller	Rolling of Asphalt Surface	114	Hour	2523.00
35	Water Tanker (16 KL)	Water Transport	150	Hour	1501.00
36	Water Tanker (12 KL)	Water Transport	150	Hour	1327.00
37	Water Tanker (6 KL)	Water Transport	100	Hour	1005.00
38	Tractor-trolley	Pulling, Tranportation,etc.	42	Hour	904.00
39	Rotavator	Scarifying	-	Hour	16.00
40	Ripper	Scarifying	-	Hour	21.00
41	Air Compressor -250 cfm	General Purpose	5	Hour	591.00
42	Air Compressor -500 cfm	General Purpose	148	Hour	2808.00
43	Integrated Stone Crusher Stone (3 Stage) 250 TPH	Crushing of Spalls	-	Hour	14744.00
44	Wet Mix Plant - 250 TPH Capacity	Wet Mix	-	Hour	878.00
45	Wet Mix Plant - 200 TPH Capacity	Wet Mix	-	Hour	583.00
46	Wet Mix Plant - 100 TPH Capacity	Wet Mix	-	Hour	558.00
47	Hotmix Plant - 200 TPH Capacity	DBM / BM / BC / Premix etc.	-	Hour	14553.00
48	Hotmix Plant - 160 TPH Capacity	DBM / BM / BC / Premix etc.	-	Hour	10338.00
49	Hotmix Plant - 120 TPH capacity	DBM / BM / BC / Premix etc.	-	Hour	8343.00
50	Batching and Mixing Plant - 240 cum Capacity	Concrete Mixing	-	Hour	6013.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
51	Batching and Mixing Plant - 120 cum Capacity	Concrete Mixing	-	Hour	3909.00
52	Mobile Concrete Batching / Mixing Plant	Concrete Mixing	60	Hour	960.00
53	Concrete Mixer - 0.4/0.28 cum	Concrete Mixing	10	Hour	492.00
54	Concrete Mixer - 1 cum	Concrete Mixing	15	Hour	533.00
55	Generator 725 KVA	Generation of Electric Energy	777	Hour	12030.00
56	Generator 500 KVA	Generation of Electric Energy	536	Hour	8320.00
57	Generator 400 KVA	Generation of Electric Energy	430	Hour	6707.00
58	Generator 250 KVA	Generation of Electric Energy	303	Hour	4728.00
59	Generator 125 KVA	Generation of Electric Energy	154	Hour	2472.00
60	Generator 100 KVA	Generation of Electric Energy	129	Hour	2108.00
61	Generator 62.5 KVA	Generation of Electric Energy	80	Hour	1351.00
62	Generator 33 KVA	Generation of Electric Energy	42	Hour	771.00
63	Generator 15 KVA	Generation of Electric Energy	20	Hour	431.00
64	Mechanical Broom Hydraulic	Surface Cleaning	50	Hour	1046.00
65	Bitumen Pressure Distributor	Applying bitumen tack coat	170	Hour	1711.00
66	Emulsion Pressure Distributor	Applying bitumen tack coat	170	Hour	1711.00
67	Bitumen Boiler Oil Fired	Bitumen Spraying	50	Hour	727.00
68	Mastic Cooker	Mastic Wearing Coat	10	Hour	640.00
69	Paver Finisher Mechanical	Paving of WMM	123	Hour	2526.00
70	Paver Finisher Hydrostatic with sensor control -240 HP	Paving of DBM / BM / BC / Premix etc.	240	Hour	8916.00
71	Paver Finisher Hydrostatic with sensor control -170 HP	Paving of DBM / BM / BC / Premix etc.	170	Hour	7057.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
72	Paver Finisher Concrete with 300 HP Motor	Paving of Concrete Surface	300	Hour	26922.00
73	Paver Finisher Concrete with 241 HP Motor	Paving of Concrete Surface	241	Hour	17458.00
74	Paver Finisher Concrete with 118 HP Motor	Paving of Concrete Surface	118	Hour	4362.00
75	Texture Curing Machine (TCM) - upto 18 m	Texturing of Concrete Surface	55	Hour	4628.00
76	Texture Curing Machine (TCM) - upto 9 m	Texturing of Concrete Surface	55	Hour	3654.00
77	Hydraulic Chip Spreader	Surface Dressing	200	Hour	2217.00
78	Pot-Hole Repair Machine	Repair of pot-holes	178	Hour	1802.00
79	Transit Mixer - 6 Cum	Mix to Site Transportation of Concrete	178	Hour	2367.00
80	Concrete Pump	Pumping of Concrete	15	Hour	1297.00
81	Boom Placer	Pumping of Concrete	178	Hour	4260.00
82	Kerb Casting Machine	Kerb Making	50	Hour	1889.00
83	Piling Rig with Bentonite Pump	Piling in foundation	360	Hour	19264.00
84	Pneumatic Sinking Plant	Sinking Purpose	250	Hour	6908.00
85	Road marking machine	Road Marking	90	Hour	1973.00
86	Mobile Slurry Seal Equipment	Mixing and laying slurry seat	115	Hour	3852.00
87	Joint Cutting Machine	Cutting Purpose	5	Hour	493.00
88	Bar Bending & Cutting Machine	Bar Cutting & Bending	5	Hour	509.00
89	Needle Vibrator	Concrete pouring	5	Hour	569.00
90	Jack Hammer for air compressor	General Purpose	-	Hour	11.00
91	Plate Compactor	Compaction	8	Hour	575.00
92	Milling Machine with 1 meter Drum Width	Milling of bitumen surface	155	Hour	4635.00
93	Milling Machine with 1.2 meter Drum Width	Milling of bitumen surface	208	Hour	5432.00
94	Milling Machine With 1.3 meter Drum Width	Milling of bitumen surface	330	Hour	7793.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
95	Milling Machine With 2 meter Drum Width	Milling of bitumen surface	500	Hour	11665.00
96	Cold in Situ recycling of bitumen's pavement with foam bitumen technology	Recycling of bitumen surface	602	Hour	29649.00
97	In situ stabilisation of WMM/GSB/Sub grade	Stabilisation of WMM/GSB/Sub grade	602	Hour	25774.00
98	Cement spreader	Spreading	350	Hour	8083.00
99	Mobile cold recycling mixing plant	Recycling of bitumen surface	300	Hour	21483.00
100	Hot in place recycling	Recycling of bitumen surface	322	Hour	103644.00
101	Pre heater unit for hot in place recycling	Recycling of bitumen surface	101	Hour	1262.00
102	Single boom Hydraulic Drill Jumbo	Drilling Purpose	78	Hour	5187.00
103	Two boom Hydraulic Drill Jumbo	Drilling Purpose	160	Hour	7880.00
104	Three boom Hydraulic Drill Jumbo	Drilling Purpose	240	Hour	11513.00
105	Hydraulic Rock bolt drill	Drilling Purpose	90	Hour	7445.00
106	Rotating Telehandlers	General Purpose	101	Hour	1185.00
107	Shotcrete Machine	Concreting Purpose	90	Hour	1765.00
108	Grouting machine	Grouting Purpose	8	Hour	762.00
109	Dewatering Pump 10 HP	Dewatering	10	Hour	326.00
110	Concrete cutting machine	Concrete cutting Purpose	5	Hour	216.00
111	Crawler mounted Crane 35 tonne capacity	Lifting Purpose	170	Hour	6137.00
112	Crawler mounted Crane 80 tonne capacity	Lifting Purpose	230	Hour	6413.00
113	Crawler mounted Crane 100 tonne capacity	Lifting Purpose	300	Hour	9693.00
114	Mobile Hydraulic Crane 3 tonne capacity	Lifting Purpose	42	Hour	1059.00
115	Mobile Hydraulic Crane 5 tonne capacity	Lifting Purpose	45	Hour	1104.00
116	Mobile Hydraulic Crane 10 tonne capacity	Lifting Purpose	48	Hour	1212.00
117	Mobile Hydraulic Crane 15 tonne capacity	Lifting Purpose	49	Hour	1249.00

CHAPTER: 20 - USAGE RATES OF PLANT AND MACHINERY

Sl. No.	Description of Machine	Activity	Power (in HP)	Unit	Rate
118	Mobile Hydraulic Crane 20 tonne capacity	Lifting Purpose	101	Hour	1573.00
119	Mobile Hydraulic Crane 35 tonne capacity	Lifting Purpose	173	Hour	2390.00
120	Concrete Bucket	For Purring Concrete		Hour	146.00
121	Prestressing Jack with Pump & Access (400 tonne)	Stressing of Steel Wires/Stands		Hour	533.00
122	Boat to carry at least 20 persons	General Purpose		hour	941.00
123	Crane with grab 0.75 cum capacity	Lifting Purpose		hour	1068.00
124	Epoxy Injection gun			hour	366.00
125	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking	Well sinking		hour	9721.00
126	Jack for Lifting 40 tonne lifting capacity	Lifting Purpose		hour	360.00
127	Vibrating Pile driving hammer complete with power unit and accessories	Pile driving		hour	18143.00
128	Transit Mixer - 6 Cum	Mix to Site Transportation of Concrete		Per Tonne Km	26.30
129	Centrifugal water pump	Water Pumping		Hour	389.00
130	Shredding Machine	Shredding of waste Plastic		Hour	549.00
131	Mobile Bridge Inspection Unit (MBIU)	For Inspection of Bridge		Hour	7091.00
132	Network Survey Vehicle (NSV) With SUV	For Pavement Inspection/Survey Purpose		Hour	6415.00
133	Falling weight deflectometer (FWD) Equipment With SUV	For Testing Purpose		Hour	3248.00
134	Retroreflectometer testing equipment with Vehicle With SUV	For Testing Retro reflection		Hour	1888.00
135	Sport utility vehicle (SUV)	General Purpose		Hour	1299.00
136	Automatic Vehicle Counter Classifier (ATCC) System	Traffic Counting		Hour	76.00

Note:- The usage rates given above are for the base year 2019-20 and derived based on the fuel & labour rate of Chhattisgarh region. Concerned States / UT's should update the same while preparing the SOR.

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.01	(A) Cement Mortar 1:3 (1 cement : 3 sand)				
	Unit = cum				
	Taking output = 1 cum				
	a) Materials				
	Cement	tonne	0.510		
	Coarse sand	cum	1.050		
	Cost of water	KL	0.255		
	b) Labour				
	Mate	day	0.048		
	Mazdoor	day	1.197		
	c) Machinery				
	Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.005 x L1 + 0.014		
	Rate per cum = (a+b+c)				
21.01	(B) Cement Mortar 1:2 (1 cement : 2 sand)				
	Unit = cum				
	Taking output = 1 cum				
	a) Materials				
	Cement	tonne	0.672		
	Coarse sand	cum	0.930		
	Cost of water	KL	0.336		
	b) Labour				
	Mate	day	0.048		
	Mazdoor	day	1.197		
	c) Machinery				
	Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.006 x L1 + 0.019		
	Rate per cum = (a+b+c)				
21.01	(C) Cement Mortar 1:4 (1 cement : 4 sand)				
	Unit = cum				
	Taking output = 1 cum				
	a) Materials				
	Cement	tonne	0.403		
	Coarse sand	cum	1.120		
	Cost of water	KL	0.202		
	b) Labour				
	Mate	day	0.048		
	Mazdoor	day	1.197		
	c) Machinery				
	Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour	0.004 x L1 + 0.011		
	Rate per cum = (a+b+c)				

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.01	(D)	Cement Mortar 1:6 (1cement :6 sand) Unit = cum Taking output = 1 cum a) Materials Cement Coarse sand Cost of water	tonne cum KL	0.288 1.337 0.144	
		b) Labour Mate Mazdoor	day day	0.048 1.197	
		c) Machinery Water tanker 12 KL capacity (speed @ 20km/hr and return speed @ 30 km/hr and 30 mins for unloading)	hour		0.003 x L1 + 0.008
		Rate per cum = (a+b+c)			
21.02		PCC 1:3:6 using batching Plant Plain cement concrete 1:3:6 nominal mix with crushed stone aggregate 40 mm nominal size mechanically mixed Unit = cum Taking output = 15 Cum a) Labour Mate Skilled Mazdoor Mazdoor	day day day	0.426 1.330 9.310	
		b) Material 40 mm Aggregate Coarse sand cement Cost of water	cum cum tonne KL	13.500 6.750 3.450 1.380	
		c) Machinery Batching Plant of capacity 120 cum/hour Generator 250 KVA Loader 3.1 cum capacity Transit truck agitator For loading & Unloading time	hour hour hour hour	0.179 0.179 0.431 0.179	
		Rate per cum = (a+b+c)/15			
	Note	Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.			
21.03		Plain/Reinforced Cement Concrete complete as per Drawing and Technical Specifications. PCC Grade M15 Using Batching Plant Unit = cum Taking output = 360 Cum a) Material Cement Coarse sand 40 mm Aggregate 20 mm Aggregate	tonne cum cum cum	99.000 162.000 194.400 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	0.213	
	Skilled Mazdoor		day	1.330	
	Mazdoor		day	3.990	
c)	Machinery				
	Batching Plant of capacity 120 cum/hour		hour	4.286	
	Generator 250 KVA		hour	4.286	
	Loader 3.1 cum capacity		hour	10.340	
	Transit truck agitator				
	For loading & Unloading time		hour	4.286	

***Per Cum Basic Cost of Labour, Material & Machinery
(a+b+c)/360***

21.04

PCC Grade M20 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	123.840
Coarse sand	cum	162.000
40 mm Aggregate	cum	129.600
20 mm Aggregate	cum	129.600
10 mm Aggregate	cum	64.800
Cost of water (Water/Cement Ratio - 0.4)	KL	49.536

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340
Transit truck agitator		
For loading & Unloading time	hour	4.286

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.05

RCC Grade M20 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	124.980
Coarse Sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Cost of water	KL	49.992

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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	Mazdoor	day	3.990
c) Machinery			
	Batching Plant of capacity 120 cum/hour	hour	4.286
	Generator 250 KVA	hour	4.286
	Loader 3.1 cum capacity	hour	10.340
Transit truck agitator			
	For loading & Unloading time	hour	4.286

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.06

PCC Grade M25 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	143.850
Coarse sand	cum	162.000
40 mm Aggregate	cum	129.600
20 mm Aggregate	cum	129.600
10 mm Aggregate	cum	64.800
Cost of water	KL	57.540

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286	
Generator 250 KVA	hour	4.286	
Loader 3.1 cum capacity	hour	10.340	
Transit truck agitator			
For loading & Unloading time	hour	4.286	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.07

RCC Grade M25 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	145.140
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 0.2 % of Cement	Kg	290.280
Cost of water	KL	58.056

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286	
Generator 250 KVA	hour	4.286	
Loader 3.1 cum capacity	hour	10.340	
Transit truck agitator			
For loading & Unloading time	hour	4.286	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.08		PCC Grade M30 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	145.800	
		Coarse sand	cum	162.000	
		40 mm Aggregate	cum	129.600	
		20 mm Aggregate	cum	129.600	
		10 mm Aggregate	cum	64.800	
		Cost of water	KL	58.320	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.09		RCC Grade M30 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	146.400	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.3 % of Cement	Kg	439.200	
		Cost of water	KL	58.560	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			
21.10		PCC Grade M35 Using Batching Plant			
		Unit = cum			
		Taking output = 360 Cum			
		a) Material			
		Cement	tonne	150.840	
		Coarse sand	cum	162.000	
		20 mm Aggregate	cum	194.400	

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		10 mm Aggregate	cum	129.600	
		Admixture @ 0.3 % of Cement	Kg	452.520	
		Cost of water	KL	60.336	
b)	Labour				
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
c)	Machinery				
		Batching Plant of capacity 120 cum/hour	hour	4.286	
		Generator 250 KVA	hour	4.286	
		Loader 3.1 cum capacity	hour	10.340	
		Transit truck agitator			
		For loading & Unloading time	hour	4.286	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360			

21.11 RCC Grade M35 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	151.920
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 0.4 % of Cement	Kg	607.680
Cost of water	KL	60.768

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340
Transit truck agitator		
For loading & Unloading time	hour	4.286

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.12 RCC Grade M40 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	154.800
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 0.8 % of Cement	Kg	1238.400
Cost of water	KL	61.920

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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c) Machinery					
Batching Plant of capacity 120 cum/hour		hour	4.286		
Generator 250 KVA		hour	4.286		
Loader 3.1 cum capacity		hour	10.340		
Transit truck agitator					
For loading & Unloading time		hour	4.286		

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.13

RCC Grade M45 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	154.800
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 1 % of Cement	Kg	1548.000
Cost of water	KL	61.920

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340
Transit truck agitator		
For loading & Unloading time	hour	4.286

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.14

RCC Grade M50 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	154.800
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 0.8 % of Cement	Kg	1238.400
Silica Fume @ 5% of Cement	Kg	7740.000
Cost of water	KL	61.920

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340
Transit truck agitator		
For loading & Unloading time	hour	4.286

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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21.15 RCC Grade M55 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	158.400
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 1 % of Cement	Kg	1267.200
Silica Fume @ 5% of Cement	Kg	7920.000
Cost of water	KL	63.360

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340

Transit truck agitator

For loading & Unloading time	hour	4.286
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Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.16 RCC Grade M60 Using Batching Plant

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	160.200
Coarse sand	cum	162.000
20 mm Aggregate	cum	194.400
10 mm Aggregate	cum	129.600
Admixture @ 1 % of Cement	Kg	1281.600
Silica Fume @ 6% of Cement	Kg	9612.000
Cost of water	KL	64.080

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340

Transit truck agitator

For loading & Unloading time	hour	4.286
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Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.17 RCC Grade M65 Using Batching Plant

Unit = cum

Taking output = 360 Cum

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
a)	Material				
Cement			tonne	162.000	
Coarse sand			cum	162.000	
20 mm Aggregate			cum	194.400	
10 mm Aggregate			cum	129.600	
Admixture @ 1 % of Cement			Kg	1296.000	
Silica Fume @ 6% of Cement			Kg	9720.000	
Cost of water			KL	64.800	
b)	Labour				
Mate			day	0.213	
Skilled Mazdoor			day	1.330	
Mazdoor			day	3.990	
c)	Machinery				
Batching Plant of capacity 120 cum/hour			hour	4.286	
Generator 250 KVA			hour	4.286	
Loader 3.1 cum capacity			hour	10.340	
Transit truck agitator					
For loading & Unloading time			hour	4.286	
Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360					

21.18 601 A DLC Using Batching Plant-240 cum capacity Plant

Unit = cum

Taking output = 450 Cum

a) Material

Cement @ 150 kg/cum of concrete	tonne	67.500
Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500
Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.	cum	405.000
Cost of water (Water/Cement Ratio - 0.4)	KL	27.000

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 240 cum/hour	hour	2.679
Generator 250 KVA	hour	2.679
Loader 3.1 cum capacity	hour	12.926

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450

21.18 601 B Dry Lean Cement Concrete Sub- base Flyash (Using Batching Plant)-240 cum capacity Plant

Unit = cum

Taking output = 450 Cum

a) Material

Cement @ 129 kg/cum of concrete	tonne	57.860
Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500
Crushed stone coarse aggregate of 25 mm and	cum	405.000

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
		12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.			
		Fly ash conforming to IS: 3812-1966 (Part-I)	cum	9.640	
		Cost of water (Water/Cement Ratio - 0.4)	KL	23.144	
	b) Labour				
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
	c) Machinery				
		Batching Plant of capacity 240 cum/hour	hour	2.679	
		Generator 250 KVA	hour	2.679	
		Loader 3.1 cum capacity	hour	12.926	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450

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

***Calculation of cement and fly ash.**

Cement @ 150 kg/cum = 450 x 150 = 67.500 tonnes.

20 percent of cement to be replaced by fly ash = 13.50 tonnes.

Balance cement = 54.0 tonnes.

Quantity of fly ash = 13.50 x specific gravity of fly ash /specific gravity of cement = 13.50 x 2.25/3.15 = 9.64 tonnes.

21.18 601 C DLC Using Batching Plant-120 cum capacity Plant

Unit = cum

Taking output = 450 Cum

a) Material

Cement @ 150 kg/cum of concrete	tonne	67.500
Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	202.500
Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.	cum	405.000
Cost of water (Water/Cement Ratio - 0.4)	KL	27.000

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	5.357
Generator 250 KVA	hour	5.357
Loader 3.1 cum capacity	hour	12.926

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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21.18	601	D Dry Lean Cement Concrete Sub- base Flyash (Using Batching Plant) -120 cum capacity Plant			
Unit = cum					
Taking output = 450 Cum					
a) Material					
Cement @ 150 kg/cum of concrete				tonne	57.860
Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete				cum	202.500
Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.6.				cum	405.000
Fly ash conforming to IS: 3812-1966 (Part-I)				cum	9.640
Cost of water (Water/Cement Ratio - 0.4)				KL	23.144
b) Labour					
Mate				day	0.213
Skilled Mazdoor				day	1.330
Mazdoor				day	3.990
c) Machinery					
Batching Plant of capacity 120 cum/hour				hour	5.357
Generator 250 KVA				hour	5.357
Loader 3.1 cum capacity				hour	12.926

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/450

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

***Calculation of cement and fly ash.**

Cement @ 150 kg/cum = $450 \times 150 = 67.500$ tonnes.

20 Percent of cement to be replaced by fly ash = 13.50 tonnes.

Balance cement = 54.0 tonnes.

Quantity of fly ash = $13.50 \times \text{specific gravity of fly ash} / \text{specific gravity of cement} = 13.50 \times 2.25 / 3.15 = 9.64$ tonnes.

21.19	602	A PQC M 35 grade Using Batching Plant-240 cum capacity Plant			
Unit =cum					
Taking output = 900 Cum					
a) Material					
Cement @ 400 kg/cum of concrete				tonne	360.000
Coarse sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete				cum	405.000
Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4..				cum	810.000
Admixture @ 0.5 % of Cement				Kg	1800.000
Cost of water				KL	144.000
b) Labour					
Mate				day	0.213
Skilled Mazdoor				day	1.330
Mazdoor				day	3.990

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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c) Machinery

Batching Plant of capacity 240 cum/hour	hour	5.357
Generator 250 KVA	hour	5.357
Loader 3.1 cum capacity	hour	25.851
Transit truck agitator		
For loading & Unloading time	hour	5.357

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900

21.19 602 B PQC M 35 grade Using Batching-240 cum capacity

Plant (Cement - Flyash)

Unit =cum

Taking output = 900 Cum

a) Material

Cement	tonne	306.000
Fly ash conforming to IS: 3812 (Part-I)	tonne	93.000
Coarse sand	cum	364.500
Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000
Admixture @ 0.5 % of Cement	Kg	1530.000
Cost of water	KL	122.400

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 240 cum/hour	hour	5.357
Generator 250 KVA	hour	5.357
Loader 3.1 cum capacity	hour	24.989
Transit truck agitator		
For loading & Unloading time	hour	5.357

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900

- Note**
1. The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.
 2. IRC: 68 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.

***Calculation of cement, sand and fly ash.**

Cement @ 400 kg/cum = 900 x 400 = 360 tonnes.

15 Percent of cement to be replaced by fly ash = 54.0 tonnes.

Balance cement = 306.00 tonnes.

Quantity of fly ash = 54.00 x specific gravity of fly ash /specific gravity of cement = 54.00 x 2.25/3.15 = 38.571 tonnes.

Sand @ 0.45 cum / cum of concrete = 900 x 0.45 = 405 x 1.6 = 648 tonnes.

10 Percent to be replaced by flyash.

Balance sand = 648 x 0.9 = 583.2 tonnes = 583.02 / 1.6 = 364.5 cum.

Quantity of flyash = (648-583.2) x specific gravity of fly ash/specific gravity of sand = 64.8 x 2.25 / 2.687 = 54.26 tonnes

Fly ash Total fly ash = 38.571 + 54.26 = 92.831 tonnes. (Say 93 tonnes)

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
21.19	602	C PQC M 35 grade Using Batching Plant-120 cum capacity Unit = cum Taking output = 900 Cum			
		a) Material			
		Cement @ 400 kg/cum of concrete	tonne	360.000	
		Coarse sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete	cum	405.000	
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000	
		Admixture @ 0.5 % of Cement	Kg	1800.000	
		Cost of water	KL	144.000	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	10.714	
		Generator 250 KVA	hour	10.714	
		Loader 3.1 cum capacity	hour	25.851	
		Transit truck agitator			
		For loading & Unloading time	hour	10.714	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900			
21.19	602	D PQC M 35 grade Using Batching Plant-120 cum capacity (Cement - Flyash) Unit= cum Taking output = 900 Cum			
		a) Material			
		Cement	tonne	306.000	
		Fly ash conforming to IS: 3812 (Part-I)	tonne	93.000	
		Coarse sand	cum	364.500	
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4. .	cum	810.000	
		Admixture @ 0.4 % of Cement	Kg	1224.000	
		Cost of water	KL	122.400	
		b) Labour			
		Mate	day	0.213	
		Skilled Mazdoor	day	1.330	
		Mazdoor	day	3.990	
		c) Machinery			
		Batching Plant of capacity 120 cum/hour	hour	10.714	
		Generator 250 KVA	hour	10.714	
		Loader 3.1 cum capacity	hour	24.989	
		Transit truck agitator			
		For loading & Unloading time	hour	10.714	
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/900			

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
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- Note**
1. The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.
 2. IRC: 68 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.

***Calculation of cement, sand and fly ash.**

Cement @ 400 kg/cum = 900 x 400 = 360 tonnes.

15 Percent of cement to be replaced by fly ash = 54.0 tonnes.

Balance cement = 306.00 tonnes.

Quantity of fly ash = 54.00 x specific gravity of fly ash /specific gravity of cement = 54.00 x 2.25/3.15 = 38.571 tonnes.

Sand @ 0.45 cum / cum of concrete = 900 x 0.45 = 405 x 1.6 = 648 tonnes.

10 Percent to be replaced by flyash.

Balance sand = 648 x 0.9 = 583.2 tonnes = 583.02 / 1.6 = 364.5 cum.

Quantity of flyash = (648-583.2) x specific gravity of fly ash/specific gravity of sand = 64.8 x 2.25 / 2.687 = 54.26 tonnes

Fly ash Total fly ash = 38.571 + 54.26 = 92.831 tonnes. (Say 93 tonnes)

21.20 409

PCC Grade M15 Using Batching Plant for Kerb

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	99.000
Coarse sand	cum	162.000
40 mm Aggregate	cum	194.400
20 mm Aggregate	cum	97.200
10 mm Aggregate	cum	32.400
Cost of water (Water/Cement Ratio - 0.4)	KL	39.600

b) Labour

Mate	day	0.213
Skilled Mazdoor	day	1.330
Mazdoor	day	3.990

c) Machinery

Batching Plant of capacity 120 cum/hour	hour	4.286
Generator 250 KVA	hour	4.286
Loader 3.1 cum capacity	hour	10.340

Transit truck agitator

For loading & Unloading time	hour	4.286
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Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.21 409

PCC Grade M20 Using Batching Plant for Kerb

Unit = cum

Taking output = 360 Cum

a) Material

Cement	tonne	123.840
Coarse sand	cum	162.000
40 mm Aggregate	cum	129.600
20 mm Aggregate	cum	129.600
10 mm Aggregate	cum	64.800
Cost of water (Water/Cement Ratio - 0.4)	KL	49.536

SUB-ANALYSIS OF CONCRETE / MORTAR RATE

Sr No	Ref. to M	Description	Unit	Quantity	Rate (Rs.)
b)	Labour				
	Mate		day	0.213	
	Skilled Mazdoor		day	1.330	
	Mazdoor		day	3.990	
c)	Machinery				
	Batching Plant of capacity 120 cum/hour		hour	4.286	
	Generator 250 KVA		hour	4.286	
	Loader 3.1 cum capacity		hour	10.340	
	Transit truck agitator				
	For loading & Unloading time		hour	4.286	

Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)/360

21.22

Cost of Water

Unit = KL

Taking output = 12 KL

a) **Labour**

Mate	day	0.007
Mazdoor	day	0.177

b) **Machinery**

Centrifugal water pump (600 LMP)	hour	0.615
Water tanker 12 KL	hour	0.615

Cost for 12 KL = a+b

Rate per KL = (a+b)/12

