



Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

**NORMS
FOR
RATE ANALYSIS
OF
ROAD AND BRIDGE WORKS**

2075

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GENERAL GUIDELINES FOR USE OF THIS NORMS FOR RATE ANALYSIS OF ROAD AND BRIDGE WORKS

The basic approach for the preparation of Norms for Rate Analysis of Road and Bridge Works are as follows:

1. Description of Items

The description of items is given briefly and linked with the relevant Sections and Clauses of the Standard Specifications for Road and Bridge Works - 2073.

A. Labour:

Requirement of Labour in average working conditions are mention for each activity. Approved daily wages applicable to work site for corresponding item shall be used to find cost of Labour component.

B. Material:

Requirement of material in average working conditions are mention for each activity. Unit rate of material having specified quality at site (including transpiration upto site from available source (Market / Quarry/ factory) shall be used to find cost of Material component.

C. Equipment:

i. Due to mechanization of construction work inputs for various items have been indicated using mechanical means. However, manual means also can be select , where area is inaccessible for machines or quantity of work is not enough to justify use of machines.

ii. Requirement of equipments in average working conditions are mention for each activity. Hire charge of equipment at work site (including transportation if not mention seperately payable item) has to be used to find cost of Equipment component. Hire charge shall include ownership charges and operation charges (Fuel component + crew component + maintenance component)

2. Working Conditions

i. Data in Norms are analyzed for average working conditions

ii. Since, the outputs of Machinery and Labour reduces substantially in maintenance works reduced outputs have been considered in corresponding activities of maintenance works.

iii. In case of night time construction , Flood lights(high-power light) and other safety arrangement shall carefully managed and manpower has to be added 50 % more than specified in corresponding activities.

iii. In case of work to be implemented in cold region , having altitude more than 3000 m, manpower and equipment component may be increased 5 % more than specified in corresponding items.

iv. In case of work to be implemented at night time, Flood light (high power light) and other safety arrangement shall be included as separate item and rate of manpower shall be used for night time work. In absence of approved rate for night time work , rate may be used as 1.4 times higher than day times work.

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SECTION 100 - GENERAL

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
1.1	104	Operation and maintenance of Temporary diversion of road/ bridge to keep the road serviceable through out the contract period as per specification and instruction of engineer <i>As per site condition</i>	Km-month/ LS	
1.2	109	Carry out maintenance of the existing road to keep the road serviceable through out the contract period as per specification and instruction of the Engineer <i>As per site condition</i>	Km- month	
1.3	110	Providing and installation of project signboards with size of 1.8 x 1.2 m as per specification and instruction of engineer. <i>Unit = Nos</i> a) Labour Skilled Unskilled b) Material Project signboards with size of 1.8 x 1.2 m having details of contract in the format and wording as directed by the Engineer	day day nos	0.10 0.50 1.00
1.4	111	Providing and establishing camp with mobilization and demobilization for contractor's Labour and staff and demolishing after completion of works as per the specifications and instruction of the Engineer. <i>As per site condition</i>	Job	
1.5	111	Relocation of services / minor infrastructures, as per specifications and instruction of the Engineer. <i>As per site condition</i>	Job	
1.6	116	Supply of Project Record as per specifications and instruction of the Engineer.	set	
1.7	111	Reinstatement of quarry sites at the completion of works as instructed by the engineers.	LS	

SECTION 200 - SITE CLEARANCE

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
2.1	I	201	Clearing and Grubbing Road Land . Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable Material to be used or auctioned, up to a lead of 30 meters including removal and disposal of top organic soil not exceeding 150 mm in thickness.		
	(i)		By Manual Means:-		
	A		In area of light jungle (less than 15 number per 100 sqm) <i>Unit = sqm, (for 10000 sqm)</i>		
			a) Labour Unskilled	day	200.00
	B		In area of thorny jungle (more than 15 numbers per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
			a) Labour Unskilled	day	300.00
	C		Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes <i>Unit =Cum, (for 100 cum)</i>		
			a) Labour Unskilled	day	200.00
	(ii)		By Mechanical Means		
	A		In area of light jungle (less than 15 number per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
			a) Labour Unskilled	day	6.00
			b) Equipment Dozer/ Excavator	hour	12.00
	B		In area of thorny jungle (more than 15 numbers per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
			a) Labour Unskilled	day	9.00
			b) Equipment Dozer/ Excavator	hour	12.00
	C		Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes <i>Unit = Cum, (for 100 cum)</i>		
			a) Labour Unskilled	day	20.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		b) Equipment Dozer/ Excavator	hour	6.00
	II	Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable Material to be used or auctioned, up to a lead of 1000 meters including removal and disposal of top organic soil not exceeding 150 mm in thickness.		
	(i)	By Manual Means:-		
	A	In area of light jungle (less than 15 number per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) Labour Unskilled	day	225.00
		b) Equipment Tractor-trolley	hour	12.00
	B	In area of thorny jungle (more than 15 numbers per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) Labour Unskilled	day	325.00
		b) Equipment Tractor-trolley	hour	12.00
	C	Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes <i>Unit = cum, (for 100 cum)</i>		
		a) Labour Unskilled	day	225.00
		b) Equipment Tractor-trolley	hour	12.00
	(ii)	By Mechanical Means		
	A	In area of light jungle (less than 15 number per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) Labour Unskilled	day	8.00
		b) Equipment Dozer/ Excavator	hour	12.00
		Tractor-trolley	hour	12.00
	B	In area of thorny jungle (more than 15 numbers per 100 sqm) <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) Labour Unskilled	day	12.00
		b) Equipment		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Dozer/ Excavator Tractor-trolley	hour hour	12.00 12.00
	C		Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes <i>Unit =Cum, (for 100 cum)</i>		
			a) Labour Unskilled	day	15.00
			b) Equipment Dozer/ Excavator Tractor-trolley	hour hour	12.00 12.00
2.2		201	Cutting of Trees, including cutting of Trunks, Branches and Removal Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable Material with all lifts and up to a lead of 1000 meters and earth filling in the depression/pit. <i>Unit = Number (for 30 number)</i>		
	(i)		Girth from 300 mm to 600 mm a) Labour Unskilled	day	25.00
			b) Equipment Tractor-trolley	hour	6.00
	(ii)		Girth from 600 mm to 900 mm <i>Unit = Number, (for 10 numbers)</i> a) Labour Unskilled	day	25.00
			b) Equipment Tractor-trolley	hour	6.00
	(iii)		Girth from 900 mm to 1800 mm <i>Unit = Number (for 5 numbers)</i> a) Labour Unskilled	day	35.00
			b) Equipment Tractor-trolley	hour	6.00
	(iv)		Girth from 1800 - 2500 mm <i>Unit = Number, (for 2 numbers)</i> a) Labour Unskilled	day	32.00
			b) Equipment Tractor-trolley	hour	6.00

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
2.3	(iv)	201	Girth above 2500 mm <i>Unit = Number (for 1 number)</i>		
			a) Labour Unskilled	day	50.00
			b) Equipment Tractor-trolley	hour	12.00
2.3		201	Clearing Grass and Removal of Rubbish and Dressing and levelling the construction surface Clearing grass/ top soil and removal up to a distance of 50 meters outside the periphery of the area , including cutting and filling of small undulation. By Manual Means <i>Unit = sqm, (for 10000 sqm)</i>		
			a) Labour Unskilled	day	100.00
2.4	(i)	202	Dismantling of Structures Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including scaffolding wherever necessary, sorting the dismantled Material, disposal of unserviceable Material and stacking the serviceable Material with all lifts and lead of 1000 meters Lime /Cement Concrete By Manual Means <i>Unit = cum, (for 20.0 cum)</i>		
			Lime Concrete, cement concrete grade M-10 and below		
			a) Labour Skilled	day	1.00
			Unskilled	day	24.00
			b) Equipment Tractor-trolley	hour	6.00
			Cement Concrete Grade M-15 & M-20 <i>Unit = cum, (for 20.0 cum)</i>		
			a) Labour Skilled	day	1.00
			Unskilled	day	30.00
			b) Equipment Tractor-trolley	hour	6.00
			Pre-stressed / Reinforced cement concrete grade M-20 & above <i>Unit = cum, (for 10.0 cum)</i>		
			a) Labour Technician	day	1.00

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled	day	3.00
		Unskilled	day	30.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	II	By Mechanical Means		
	A	Cement Concrete Grade M-15 & M-20		
		<i>Unit = cum, (for 10.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	6.00
		b) Equipment		
		Air Compressor	hour	6.00
		Drilling machine with bit and accessories	hour	6.00
		Tractor-trolley	hour	6.00
	B	Prestressed / reinforced cement concrete grade M-20 & above		
		<i>Unit = cum, (for 10.0 cum)</i>		
		a) Labour		
		Skilled	day	2.00
		Unskilled	day	10.00
		b) Equipment		
		Air Compressor	hour	6.00
		Drilling machine with bit and accessories	hour	6.00
		Tractor-trolley	hour	6.00
	(ii)	Dismantling Brick / Tile work		
	A	In lime mortar		
		<i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	12.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	B	In cement mortar		
		<i>Unit = cum, (for 10.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	10.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	C	In mud mortar		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	10.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	D	Dry brick pitching or brick soling		
		<i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	12.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	(iii)	Dismantling Stone Masonry		
	A	Rubble stone masonry in lime mortar		
		<i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	15.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	B	Rubble stone masonry in cement mortar.		
		<i>Unit = cum, (for 10.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	10.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	C	Rubble Stone Masonry in mud mortar.		
		<i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	12.00
		b) Equipment		
		Tractor-trolley	hour	6.00
	D	Dry rubble masonry		
		<i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	10.00

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		b) Equipment Tractor-trolley	hour	6.00
	E	Dismantling stone pitching/ dry stone spalls. <i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour Skilled	day	1.00
		Unskilled	day	8.00
		b) Equipment Tractor-trolley	hour	6.00
	F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled Material. <i>Unit = cum, (for 20.0 cum)</i>		
		a) Labour Skilled	day	1.00
		Unskilled	day	15.00
		b) Equipment Tractor-trolley	hour	6.00
	(iv)	Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level <i>Unit = cum, (for 10.0 cum)</i>		
		a) Labour Skilled (Carpenter)	day	1.00
		Unskilled	day	10.00
		b) Equipment Tractor-trolley	hour	6.00
	(v)	Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet. <i>Unit = tonne, (for 5 tonne)</i>		
	A	Including dismembering		
		a) Labour Skilled	day	5.00
		Unskilled	day	20.00
		Add 2.5 per cent of cost of Labour for gas cutting, ropes, pulleys etc.		
		b) Equipment Tractor-trolley	hour	6.00
	B	Excluding dismembering.		
		a) Labour Unskilled	day	16.00
		Skilled	day	4.00
		Add 2.5 per cent of cost of Labour for gas cutting, ropes, pulleys etc.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		b) Equipment Tractor-trolley	hour	6.00
	C	Extra over item No(v) A and(v) B for cutting rivets. <i>Unit = number, (for 50 rivets)</i>		
		a) Labour Skilled	day	1.00
		Unskilled	day	1.00
	(vi)	Scraping of Bricks Dismantled from Brick Work including Stacking. <i>Unit = number, (for 200 numbers)</i>		
	A	In lime/Cement mortar		
		a) Labour Skilled	day	1.00
		Unskilled	day	8.00
	B	In mud mortar		
		a) Labour Skilled	day	1.00
		Unskilled	day	5.00
	(vii)	Scraping of Stone from Dismantled Stone Masonry <i>Unit = cum, (for 10.0 cum)</i>		
	A	In cement and lime mortar		
		a) Labour Skilled	day	1.00
		Unskilled	day	14.00
	B	In Mud mortar		
		a) Labour Skilled	day	1.00
		Unskilled	day	5.00
	(viii)	Scarping Plaster in Lime or Cement Mortar from Brick/ Stone Masonry <i>Unit = sqm, (for 200 sqm)</i>		
		a) Labour Skilled	day	1.00
		Unskilled	day	10.00
		b) Equipment Tractor-trolley	hour	6.00
	(ix)	Removing all type of Hume Pipes and Stacking within a lead of 50 metres including Earthwork and Dismantling of Masonry Works.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
2.5	202	Unit = meter, (for 10 meter) Up to 600 mm dia a) Labour Skilled Unskilled	day day	1.00 5.00
		Above 600 mm to 900 mm dia a) Labour Skilled Unskilled	day day	1.00 8.00
		Above 900 mm a) Labour Skilled Unskilled	day day	1.00 12.00
		Remarks 1. The excavation of earth, dismantling of stone masonry work in head walls and protection works is not included which is to be measured and paid separately. 2. Credit for retrieved stone from masonry work may be taken as per actual availability.		
		Dismantling of Flexible Pavements Dismantling of flexible pavements and disposal of dismantled Material up to a lead of 1000 metres, stacking serviceable and unserviceable Material separately Unit = cum, (for 10.0 cum)		
		I A By Manual Means Bituminous courses a) Labour Skilled Unskilled b) Equipment Tractor-trolley	day day hour	1.00 15.00 6.00
		B Granular courses a) Labour Skilled Unskilled b) Equipment Tractor-trolley	day day hour	1.00 12.00 6.00
		II A By Mechanical Means Unit = cum, (for 20.0 cum) Bituminous course a) Labour Skilled	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
2.6	202	Unskilled	day	9.00	
		b) Equipment			
		Tractor-trolley	hour	6.00	
		Tractor with ripper	hour	6.00	
		Dismantling of Cement Concrete Pavement			
		Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled Material up to a lead of 1000 metres, stacking serviceable and unserviceable Material separately			
		<i>Unit = cum, (for 10.0 cum)</i>			
		a) Labour			
		Skilled	day	1.00	
		Semi skilled	day	8.00	
Unskilled	day	8.00			
b) Equipment					
Air compressor	hour	6.00			
Tractor-trolley	hour	6.00			
Joint Cutting Machine	hour	6.00			
	Remarks	The above analysis is for removal of complete pavement. In case full depth repair work is required to be done after dismantling, provision of a concrete cutting and sawing machine may be added for 0.25 hours.			
2.7	202	Dismantling of Guard Rails Dismantling guard rails by manual means and disposal of dismantled Material with all lifts and up to a lead of 1000 metres, stacking serviceable Material and unserviceable Material separately. <i>Unit = meter, (for 100 meter)</i>			
		a) Labour			
		Skilled	day	1.00	
		Unskilled	day	20.00	
		b) Equipment			
		Tractor-trolley	hour	6.00	
2.8	202	Dismantling of Kerb Stone Dismantling Kerb stone by manual means and disposal of dismantled Material with all lifts and up to a lead of 1000 meter <i>Unit = meter, (for 100 meter)</i>			
		a) Labour			
		Skilled	day	1.00	
		Unskilled	day	3.00	
		b) Equipment			

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Tractor-trolley	hour	6.00
2.9	202	<p>Dismantling of Kerb Stone Channel Dismantling Kerb stone channel by manual means and disposal of dismantled Material with all lifts and up to a lead of 1000 meter <i>Unit = meter, (for 100 meter)</i></p> <p>a) Labour Skilled</p>	day	1.00
		Unskilled	day	5.00
		b) Equipment Tractor-trolley	hour	6.00
2.10	202	<p>Dismantling of Kilometer Stone Dismantling of kilometer stone including cutting of earth, foundation and disposal of dismantled Material with all lifts and lead upto 1000 m and back filling of pit. <i>Unit = number, (for 50 number)</i></p> <p>A Five KM stone Quantity of concrete = 0.2 cum per post</p> <p>a) Labour Unskilled</p>	day	5.00
		b) Equipment Tractor-trolley	hour	6.00
		B One KM Stone Quantity of concrete = 0.1 cum per post <p>a) Labour Unskilled</p>	day	4.00
		b) Equipment Tractor-trolley	hour	3.00
2.11	202	<p>Dismantling of Fencing Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled Material with all lifts and up to a lead of 1000 metres, stacking serviceable Material and unserviceable Material separately. <i>Unit = meter, (for 100 meter)</i></p> <p>a) Labour Unskilled</p>	day	12.00
		Skilled	day	2.00
		b) Equipment Tractor-trolley	hour	6.00
2.12	202	Dismantling of CI Water Pipe Line		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
2.13	202	<p>Dismantling of CI water pipe line upto 600 mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable Material and unserviceable Material separately .</p> <p><i>Unit = meter, (for 100 meter)</i></p> <p>a) Labour Unskilled Skilled (Plumber)</p> <p>b) Equipment Truck Crane</p>	day day hour hour	25.00 2.00 6.00 6.00
		<p>Remarks</p> <p>The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.</p>		
2.13	202	<p>Removal of Cement Concrete Pipe of Sewer Gutter</p> <p>Removal of cement concrete pipe of sewer gutter 1500 mm dia including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable Material separately but excluding earth excavation and dismantling of masonry works.</p> <p><i>Unit = meter, (for 100 meter)</i></p> <p>a) Labour Unskilled</p> <p>b) Equipment Crane Truck flat body</p>	day hour hour	30.00 6.00 6.00
		<p>Remarks</p> <p>The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.</p>		
2.14	202	<p>Removal of Telephone / Electric Poles and Lines</p> <p>Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 metres and stacking the serviceable and unserviceable Material separately</p> <p><i>Unit = nos, (for 30 nos)</i></p> <p>a) Labour Unskilled Skilled (Electrician/Lineman)</p> <p>b) Equipment Tractor-trolley</p>	day day hour	15.00 3.00 6.00
		<p>Remarks</p> <p>The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.</p>		

SECTION 300 - SOIL IMPROVEMENT

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
3.1	301	Reinforced Soil wall Structure with Tera Mesh System (TMS) Facing:		
		Providing and fixing Flexible Geogrids (e.g. Paralink) as primary reinforcement for composite soil reinforcement system, made of polyester core with polyethylene coating including secondary reinforcement of Terramesh system (TMS) as per Specifications Clause 2402 with Zinc +PVC coated as Facing material, laying of Geo textile, drainage gallery filling with boulder all complete as per Specifications		
		<i>Unit = sqm, (For 1000 sqm; 10 m height 100 m length)</i>		
		(a) Labour		
		Skilled	day	346.0
		Unskilled	day	1398.0
		(b) Equipment		
		Tractor-trolley	hour	24.0
		(c) Material		
		High Strength Flexible Geogrids (made of polyester core with polyethylene coating) with Strength as per design (at least 200 KN/ m)	sqm	9000.0
		Terra Mesh System (TMS)(3 m * 2 m * 0.5 m) made of mechanically woven Zn +PVC coated		
		Size: 3 m * 2 m * 0.5 m	nos	500.00
Size: 3 m * 2 m * 1 m	nos	250.00		
Stone/Boulder (for TMS drainage gallery)	cum	1826.0		
Geo textile (at interface of boulder in the TMS structural fill and around the drainage gallery)	sqm	4290.0		
Perforated pipe (PVC/HDPE)160 mm dia behind the structure in longitudinal direction (100 m) and in Transverse direction, from rare end to front end plus 1 m @ 10 m c/c, 99 m, including all joints and fixings as required.	m	199.0		
(d) Structural filling behind the TMS facia with granular material compacted up to Modified Proctors density at layers not exceeding 15 cm all complete with compaction by using machines	cum	10200.0		
Remarks		1. In case of different size than above specified use required size of TMS and modified required quantity. 2. Polyethylene coating shall design life >100 years (based on manufacture certificate) 3. Above value may vary as per design of the Engineer based on site condition.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
3.2	301	<p>Reinforced Soil wall Structure with Green Terra Mesh (GTM) Facing: Providing and fixing Flexible Geogrids (e.g. Paralink) as primary reinforcement for composite soil reinforcement system, made of polyester core with polyethylene coating with design life >100 years including secondary reinforcement of Green Terramesh system (GTM) as per Specifications Clause 2402 with Zn+PVC coated with Bio-Mat, Steel Greed made of MS bar (10 mm dia and grid size 160 mm x 160 mm), 3 nos of anchor bars of 10 mm dia to maintain the slope of GTM, laying of Geo textile, drainage gallery filling with boulder etc. all complete as per Specifications.</p> <p><i>Unit = sqm (For 1000 sqm, 9.6 m height 104 m length)</i> Taking output = 1000 sqm (9.6 m height and 104 m length) Length of reinforcement= 8 m, Vertical Spacing between two consecutive reinforcement layers= 1 m</p> <p>(a) Labour Skilled day 140.0 Unskilled day 545.0</p> <p>(b) Equipment Tractor-trolley hour 24.0</p> <p>(c) Material High Strength Flexible Geogrids (made of polyester core with polyethylene coating) with Strength as per design (at least 200 KN/ m) sqm 7987.0</p> <p>Green Terra Mesh (GTM) made of mechanically woven Zn +PVC coated with bio mat, steel grid made of MS bar, (10 mm dia and grid size 160 mm * 160 mm, 3 nos of anchor bars of 10 mm dia to provided to maintain the designed slope</p> <p>Size: 3 m * 2 m * 0.8 nos 312.0 Size: 3 m * * 0.6 nos 416.0 stone/boulder (for drainage gallery 0.6 m width volume 658.94 cum) cum 725.0 Geo textile (at interface of boulder and TMS sqm 2196.0 perforated pipe (PVC/HDPE)160 mm dia including all joints and fixings as required. m 199.0</p> <p>(d) Filling with fertile soil immediatly behind the GTM facia for a thickness of 0.30 m with compaction at layers not exceeding 15 cm all complete cum 299.5</p> <p>(e)Structural filling behind the GTM facia with granular material compacted up to Modified Proctors density at layers not exceeding 15 cm all complete with compaction by using machines cum 7987.2</p> <p>(f) Seeding for vegetation sqm 998.4</p>		
	Remarks	<p>1. In case of different size than above specified use required size of GTM and modified required quantity. 2. Above value may vary as per design / based on site condition.</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
3.3	301	<p>Reinforced Soil wall Structure with Concrete Facing: Providing and fixing Flexible Geogrids (e.g. Paralink) as primary reinforcement for composite soil reinforcement system, made of polyester core with polyethylene coating with design life >100 years including secondary reinforcement of Green Terramesh system (GTM) as per Specifications Clause 2402 with Zn+PVC coated with Bio-Mat, Steel Greed made of MS bar (10 mm dia and grid size 160 mm x 160 mm), 3 nos of anchor bars of 10 mm dia to maintain the slope of GTM, laying of Geo textile, drainage gallery filling with boulder etc. all complete as per Specifications.</p> <p><i>Unit = sqm (For 1000 sqm , 9.6 m height, 104 m length)</i> Length of reinforcement= 8 m, Vertical Spacing between two consecutive reinforcement layers= 0.4 m</p> <p>(a) Labour Skilled day 80.0 Unskilled day 160.0</p> <p>(b) Equipment Tractor-trolley hour 72.0</p> <p>(c) Material High Strength Flexible Geogrids (made of polyester core with polyethylene coating) with Strength as per design (at least 200 KN/ m) sqm 19968.0 or Para web 50 KN and 100 ken each m 2*19968 precast concrete panel of M 25 grade concrete (2 m * 0.8 m slope 6 deg cum 219.7 coarse drained material at the facing of Concrete Panel cum 300.0 stone/boulder (for drainage gallery 0.6 m width volume 658.94 cum) cum 725.0 Geo textile (at interface of boulder and TMS sqm 2196.0 perforated pipe (PVC/HDPE)160 mm dia behind the structure in longitudinal direction (104 m) and in Transverse direction, from rare end to front end plus @ c/c, 99 m, including all joints and fixings as required. m 199.0</p> <p>(d)Structural filling behind the GTM facia with granular material compacted up to Modified Proctors density at layers not exceeding 15 cm all complete with compaction by using machines cum 10852.0</p>		
	Remarks	<p>1. Back fill material can be substitute by embankment material and constructed as road embankment as per width requirement</p> <p>2. Above value may vary as per design of the Engineer based on site condition.</p>		

SECTION 400 - FENCING

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
4.1		403	<p>Boundary pillar Providing and fixing of Reinforced cement concrete M 15 grade boundary pillars of standard design Drawing (top 150 mm dia, bottom 200 mm dia having 1.05 m height, 300 mm above ground and 750 mm below ground with 6 mm dia bar two main bar having 1.84 m length each and 5 stirrups fixed in position including finishing and lettering but excluding painting as per Drawing and Technical Specifications. <i>Unit = no., (for 57 Nos.)</i></p> <p>a) M-15 grade of the concrete b) Steel reinforcement c) Excavation in soil d) Lettering, each 10 cm high</p> <p>Transportation and fixing e) Labour Skilled (Blacksmith) Unskilled f) Equipment Tractor-trolley g) Material Stone spall</p>	cum kg cum letter-cm high day day hour cum	1.25 79.80 1.35 2280.00 0.57 20.00 6.00 11.97
	Remarks		In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.		
4.2	A	404	<p>GI Barbed Wire fencing GI Barbed Wire Fencing 1.2 Meter High with RCC post</p> <p>Providing and fixing 1.2 m high GI barbed wire fencing with 1.8 m RCC posts 150 mm x 150 mm placed every 3 m center-to-center founded in M 15 grade cement concrete, 0.6 m below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc., complete as per Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 30 meters)</i></p> <p>a) M-15 grade of the concrete (RCC. Post 150 mm x 150 mm x 1.80 m, 13 Nos) b) Steel reinforcement (10 mm dia HYSD bars for posts (13 x 4 x 1.7 = 88.4 m @ 0.62 kg/m = 54.81 kg), 6 mm dia HYSD bars for stirrups@ 150 mm C/c (13 x 12 x 0.59 = 92.04 m @ 0.22 kg/m = 20.25 kg)</p>	cum kg	0.53 75.06

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			<p>c) Painting (Applying two coats of painting including primer coat on exposed surface of RCC posts)</p> <p>Transportation and fixing</p> <p>d) Labour Skilled (Blacksmith) day 0.25 Unskilled day 3.00</p> <p>e) Materials Barbed wire kg 31.42 Add for GI staple binding wire, drilling holes, etc. @ 5 per cent of the cost of binding wire</p>		8.14
	Remarks		<p>Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.</p>		
	B		<p>GI Barbed Wire Fencing 1.8 Meter High with RCC post</p> <p>Providing and fixing 1.8 m high GI barbed wire fencing with 2.4 m RCC M 15 grade 150 mm x 150 mm concrete post placed every 3 m center-to-center founded in M 15 grade cement concrete, 0.6 m below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc. complete as per Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 30 meters)</i></p> <p>a) M-15 grade of the concrete cum 0.70 b) Steel reinforcement kg 101.15 c) Painting sqm 12.10</p> <p>Transportation and fixing</p> <p>d) Labour Skilled (Blacksmith) day 0.50 Unskilled day 3.50</p> <p>e) Materials Barbed wire kg 40.15 Add for GI staple binding wire, drilling holes, etc. @ 5 per cent of the cost of binding wire</p>		
	Remarks		<p>Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
4.2	C	404	<p>GI Barbed Wire Fencing 1.2 Meter High on Angle Iron Providing and fixing 1.2 meters high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 meters center to center founded in M 15 grade cement concrete, 0.6 meter below ground level, every 15th post, end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc. complete as per Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 30 meters)</i></p> <p>a) Labour Skilled (Blacksmith) day 0.25 Unskilled day 2.00</p> <p>b) Material Barbed wire kg 31.42 MS angle iron 40 mm x 40 mm x 6 mm, kg 80.50 Add for GI staple binding wire, drilling holes etc. @ 2 per cent of the cost of material</p> <p>c) Painting Applying two coats of painting sqm 2.11</p>		
			<p>Remarks</p> <p>Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.</p>		
4.2	D	404	<p>GI Barbed Wire Fencing 1.8 Meter High Providing and fixing 1.8 meters high GI barbed wire fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 meters center to center founded in M 15 grade cement concrete, 0.6 meter below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc. complete as per Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 30 meters)</i></p> <p>a) Labour Skilled (Blacksmith) day 0.40 Unskilled day 3.00</p> <p>b) Material Barbed wire kg 40.15 MS angle iron 50 mm x 50 mm x 6 mm, kg 152.00 Add for GI staple, binding wire, drilling holes etc. @ 2 per cent of the cost of material</p> <p>c) Painting Applying two coats of painting sqm 3.96</p>		
			<p>Remarks</p> <p>Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
4.3		400	<p>Fencing With Welded Steel Wire Fabric 75 mm x 50 mm</p> <p>Providing and fixing 1.20 meter high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 meter center to center with 0.40 meter embedded in M 15 grade cement concrete, corner, end and every 10th post to be strutted, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete as per Drawing and Technical Specifications. <i>Unit = meter (For 30 meters)</i></p> <p>a) Labour Skilled (Welder) day 1.00 Unskilled day 3.00</p> <p>b) Material i) Angle iron for posts 50 x 50 x 6 mm kg 106.00 ii) Runner flat 50 x 5 mm kg 26.00 iii) Welded steel wire fabric 75 x 50 mm mesh kg 151.00</p> <p>OR Welded steel wire fabric 75 x 25 mm mesh kg 293.00 Add 2.5 per cent of cost of material for drilling holes in angles, flats, splitting angle at bottom, nuts and bolts and welded consumables</p> <p>c) Equipment Tractor-trolley hour 0.10</p> <p>d) Painting Painting two coats including priming sqm 8.00</p>		
	Note		i) Adopt any one type of welded steel wire fabric 75 x 50 mm or 75 x 25 mm as per approved design. ii) The item of excavation and cement concrete in foundation shall be measured and paid separately		

NORMS FOR RATE ANALYSIS

SECTION 500 - QUALITY CONTROL

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.1	504	Laboratory Setup including supply of electricity, water, gas and heating etc. Unit : set To be estimated on lump-sum basis as per the requirements mentioned in the contract / under special Provisions.		
5.2	504	Providing, installing and maintaining Quality control laboratory with equipment as specified in the Technical Specifications. Unit : set To be estimated on lump-sum basis as per the requirements mentioned in the contract / under special Provisions.		
5.3	504	Operation of Laboratory with Technical support of Laboratory staff Unit : Man- month To be estimated for each personnel assigned to the laboratory as per the list & requirements mentioned in the contract / under Special Provisions.		
5.4	500	Field Test		
5.4.1		Carryout Axle load survey including all consumables and accessories. Unit = no. of reading a) Labour Skilled day 1.00 Semiskilled day 2.00 Unskilled day 6.00 b) Material Flag (red cloth) meter 2.00 Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Jeep hour 8.00 weigh bridge hour 16.00 Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, whistle, clip board and other T&P		
	Remarks:	Rate obtained shall be minimum for upto 50 axle load, if the axle readings are more than 50 , add additional cost of per axle reading rate.		
5.4.2	500	Carryout Benkelman Beam Deflection Test including all consumables and accessories. Unit = no of reading (For 50 point reading) a) Labour Skilled day 2.00 Semiskilled day 4.00 Unskilled day 10.00 b) Material		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.4.3		Boulder (11 ton,) (ten times used) Enamel paint Glycerin Flag (red cloth) Add 33 % boulder cost for Loading weighing, air pressure of tire etc. Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Jeep/ pickup Heavy Truck Benkelman Beam Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, clip board and other T&P	cum Lit Lit meter hour hour hour	8.00 0.50 0.50 2.00 8.00 8.00 8.00
	505	Remarks: Rate obtained shall be minimum for upto 50 deflection reading, if the readings are more than 50 , add additional cost of per deflection reading rate. Carryout Field Density test of sub grade/ sub base/ base test by Sand replacement Method as per procedure mentioned in the Technical Specifications. Unit = nos. (For 50 Nos) a) Labour Skilled semiskilled Unskilled b) Material Standard Sand (50 % reusable) Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Field Density Jar Baseplate Balance(20 kg) Oven/Rapid Moisture Air tight Bottle Can Measuring Cylinder Jeep/ pickup Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, clip board and other T&P	day day day kg day day day day day day day day day hour	1.00 2.00 4.00 300.00 1.00 1.00 1.00 1.00 5.00 5.00 1.00 8.00
5.4.4	505	Remarks: Rate obtained shall be minimum for upto 50 density reading, if the readings are more than 50 , add additional cost of per density reading rate. Sampling from Subgrade, Sub base, base and Wearing Course Unit = nos. (For 50 Nos samples) a) Labour Skilled Semiskilled	day day	1.00 2.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled b) Material Jute Bag Flag/ Clothes Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Jeep/ pickup Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, clip board and other T&P	day nos meter hour	4.00 60.00 4.00 8.00
5.4.5		505	<p>Remarks:</p> <p>Rate obtained shall be minimum for upto 50 sampling, if the samplings are more than 50 , add additional cost of per sampling rate.</p> <p>Carryout Rapid Determination of CBR by dynamic core penetrometer as per test procedure mentioned in the Technical Specifications. Unit = point (For 50 point)</p> <p>a) Labour Skilled semiskilled Unskilled b) Material Flag/ Clothes Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Dynamic cone penetrometer Jeep/ pickup Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, clip board and other T&P</p>	day day day meter day hour	1.00 1.00 2.00 2.00 1.00 8.00
5.4.6		505	<p>Remarks:</p> <p>Rate obtained shall be minimum for upto 50 CBR, if the CBR determinations are more than 50 , add additional cost of per CBR determination rate.</p> <p>Carryout Measurement of Pavement Thickness including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = point (For 60 point)</p> <p>a) Labour Skilled semiskilled Unskilled b) Material Flag/ Clothes Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment</p>	day day day meter	1.00 2.00 4.00 2.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.4.7	500	Jeep/ pickup Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, clip board and other T&P	hour	8.00
		<p>Remarks:</p> <p>Rate obtained shall be minimum for upto 50 measurement, if the measurement points are more than 50 , add additional cost of per measurement rate.</p> <p>Carryout Field Vane Shear Test in Cohesive Soil including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (For 2 tests per day)</p> <p>a) Labour</p> <p>Skilled day 1.00</p> <p>semiskilled day 2.00</p> <p>Unskilled day 4.00</p> <p>b) Material</p> <p>Flag/ Clothes meter 2.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Vane Apparatus set day 1.00</p> <p>Dial gauge 2 Nos day 2.00</p> <p>Jeep/ pickup hour 8.00</p> <p>Add 5 % of Labour cost for traffic control sign and other T&P</p>		
5.4.8	500	<p>Remarks:</p> <p>Rate obtained shall be minimum for upto 2 test, if the no of tests are more than 2 , add additional cost of per test rate.</p> <p>Carryout Static Plate Load Test up to 25 tones per sqm including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (For one test 4 day time)</p> <p>a) Labour</p> <p>Skilled day 4.00</p> <p>semiskilled day 8.00</p> <p>Unskilled day 80.00</p> <p>b) Material</p> <p>Sand (ten times used) cum. 40.00</p> <p>Flag/ Clothes meter 2.00</p> <p>Jute Bag nos 625.00</p> <p>Add 25 % of Labour cost for other consumable items</p> <p>c) Equipment</p> <p>Plate load Apparatus Set (600 mm dia) day 4.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.4.9	500	Spirit Level	day	4.00
		Dial gauge 4 Nos	day	4.00
		Jeep/ pickup	hour	8.00
		Add 5 % of Labour cost for traffic control sign, traffic cone, rope, hammer, wrench, clip board and other T&P		
		Carryout Static Plate Load Test up to 10 tones per sqm including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (For 1 test per day)		
		a) Labour		
		semiskilled	day	8.00
		Unskilled	day	40.00
		b) Material		
		Sand (ten times used)	cum.	16.00
		Flag/ Clothes	meter	2.00
		Jute Bag	nos	250.00
		Add 25 % of Labour cost for other consumable items		
c) Equipment				
Plate load Apparatus Set (600 mm dia)	day	4.00		
Spirit Level	day	4.00		
Dial gauge 4 Nos	day	4.00		
Jeep/ pickup	hour	8.00		
Add 5 % of Labour cost for traffic control sign, traffic cone, and other T&P				
5.4.10	500	Carryout Pile Load Test up to 200 tones including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (for one test 7 days)		
		a) Labour		
		Skilled	day	7.00
		semiskilled	day	21.00
		Unskilled	day	49.00
		b) Material		
		Sand (ten times used)	cum.	160.00
		Flag/ Clothes	meter	2.00
		Jute Bag	nos	2500.00
		Masonry wall	cum.	
		Wooden planks, 12 times used	cum.	0.50
		12 Nos of back pipes, 30 times used	meter	36.00
		I beams 4 Nos 3 m long (25-30 kg/m), 200 times used	meter	12.00
Add 25 % of Labour cost for other consumable items				
c) Equipment				

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.4.11		500, 1300	Spirit Level	day	7.00
			Dial gauge 4 Nos	day	7.00
			Jeep/ pickup	hour	56.00
			Add 5 % of Labour cost for traffic control sign, pressure gauge and other T&P		
			Coring of asphalt concrete Sample from pavement including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (For 30 samples per day)		
			a) Labour		
			Skilled	day	1.00
			semiskilled	day	2.00
			Unskilled	day	2.00
			b) Material		
Jute Bag/ Polythene bag	nos	30.00			
Flag/ Clothes	meter	2.00			
Add 3 % Labour cost for Gloves, masks and other consumable items					
c) Equipment					
Core Cutting Machine with Bit and accessories	day	1.00			
Jeep/ pickup	hour	8.00			
Add 5 % of Labour cost for traffic control sign, traffic cone, rope, hammer, wrench, clip board and other T&P					
	Remarks:		Rate obtained shall be minimum for upto 30 samples, if the no of samples are more than 30 , add additional cost of per sampling rate.		
5.4.12		500, 2000	Carryout Schmidt Hammer Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (For 100 tests)		
			a) Labour		
			Skilled	day	1.00
			semiskilled	day	2.00
			b) Material		
			Add 3 % Labour cost for Gloves, masks and other consumable items		
			c) Equipment		
			Schmidt Hammer	day	1.00
			Jeep/ pickup	hour	8.00
			Add 5 % of Labour cost for traffic control sign, traffic cone, hammer, clip board and other T&P		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.4.13	500, 2000	Rate obtained shall be minimum for upto 100 test, if the no of tests are more than 100 , add additional cost for per test rate.		
		<p>Carryout Bridge Load test (Load testing of one or more spans of bridge as selected by the Engineer as per approved load test procedure following relevant IS/IRC codes including deflection measuring instruments, loading materials, recoding and analyzing the load testing results cleaning of girder after load test, etc.) Unit = nos (For 100 Mt)</p> <p>a) Labour Skilled day 7.00 semiskilled day 7.00 Unskilled day 200.00</p> <p>b) Material Hire charges of Kent ledges / Cost of Filled up bags including material as sand or earth nos 7000.00 Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals. Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Add 3 % of Labour cost for Deflection measurement instrument, traffic control sign, traffic cone, and other T&P</p>		
5.5 5.5.1	505 - 508	Rate obtained shall be minimum for upto 100 tonne, if the applied load is more than 100 tonne , add additional cost for each tonne on test rate.		
		<p>Laboratory Test Sample preparation for inappropriate sample by crushing for LAA, ACV, AIV test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 30 tests)</p> <p>a) Labour Skilled day 0.10 semiskilled day 0.50 Unskilled day 1.00</p> <p>b) Material Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Laboratory Crusher Machine hour 4.00 Tray hour 8.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.2	505 - 508	<p>Carry out Grain size Analysis including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 8 tests)</p> <p>a) Labour</p> <p>Engineer day 0.10</p> <p>Skilled day 0.25</p> <p>semiskilled day 0.50</p> <p>Unskilled day 2.00</p> <p>b) Material</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Sieves set hour 4.00</p> <p>Sieve Shaker hour 4.00</p> <p>Oven hour 48.00</p> <p>Can hour 48.00</p> <p>Tray hour 12.00</p> <p>Rubber Mallet hour 4.00</p> <p>Balance (20 kg) hour 4.00</p> <p>Balance (1 Kg) hour 4.00</p>		
5.5.3	505 - 508	<p>Carryout Particle Size analysis of soil by Hydrometer method including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 8 tests)</p> <p>a) Labour</p> <p>Skilled day 0.75</p> <p>semiskilled day 1.00</p> <p>Unskilled day 1.50</p> <p>b) Material</p> <p>Distilled Water Lit 12.00</p> <p>Sodium Hydro oxide gm. 12.00</p> <p>Filter paper sq. ft. 2.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Sieves set hour 1.00</p> <p>Sieve Shaker hour 0.50</p> <p>Tray hour 2.00</p> <p>Can hour 48.00</p> <p>Hydrometer hour 72.00</p> <p>Measuring Cylinder hour 144.00</p> <p>Thermometer hour 72.00</p> <p>Constant Water bath hour 72.00</p> <p>Pyncnometer hour 1.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.4	505 - 508	<p>Add 3 % of Labour cost for other T&P</p> <p>Carryout California Bearing Ratio (soaked) including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 2.00</p> <p>b) Material Filter paper sq. ft. 3.00 Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Sieves set hour 2.00 oven hour 24.00 Tray hour 4.00 Can 3 Nos hour 72.00 Balance (20 kg) hour 6.00 Balance (1 Kg) hour 2.00 Mould for 4 days hour 96.00 Measuring Cylinder hour 1.00 CBR testing Machine hour 1.00 Water Bath hour 96.00 Add 3 % of Labour cost for swelling device other T&P</p>		
5.5.5	505 - 508	<p>Carryout California Bearing Ratio(uns soaked) including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 2.00</p> <p>b) Material Filter paper sq. ft. 3.00 Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Sieves set hour 2.00 oven hour 24.00 Tray hour 4.00 Can 3 Nos hour 24.00 Balance (20 kg) hour 6.00 Balance (1 Kg) hour 2.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.6	505 - 508	Mould	hour	4.00
		Measuring Cylinder	hour	1.00
		CBR testing Machine	hour	1.00
		Add 3 % of Labour cost for other T&P		
		Carryout California Bearing Ratio test on compacted sample brought from outside including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 8 tests)		
		a) Labour		
		Skilled	day	0.25
		semiskilled	day	0.50
		Unskilled	day	1.00
5.5.7	505 - 508	b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Balance (20 kg)	hour	0.50
		CBR testing Machine	hour	2.50
		Add 3 % of Labour cost for other T&P		
		Carry out Moisture and Density test to determine optimum moisture content including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = set (For one set i.e. 4 tests)		
		a) Labour		
		Skilled	day	0.25
semiskilled	day	0.50		
Unskilled	day	1.00		
5.5.7	505 - 508	b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Sieves set	hour	4.00
		oven	hour	24.00
		Can 9 Nos	hour	216.00
		Tray (75*75 cm) 3 Nos	hour	36.00
		Tray (30* 30 cm) 12 Nos	hour	96.00
		Balance (20 kg)	hour	4.00
		Balance (1 Kg)	hour	4.00
5.5.7	505 - 508	Mould	hour	8.00
		Measuring Cylinder	hour	4.00
		Add 3 % of Labour cost for other T&P		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.8	505 - 508	<p>Carryout Permeability test of clayey soil (Constant head, disturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For one test)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 2.00</p> <p>b) Material Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment oven hour 24.00 Can 3 Nos hour 72.00 Tray (75*75 cm) 3 Nos hour 12.00 Mould hour 8.00 Balance (20 kg) hour 1.00 Balance (2 Kg) hour 1.00 Measuring Cylinder hour 4.00 Permeability app set (for 3 days) hour 72.00 Add 3 % of Labour cost for other T&P</p>		
5.5.9	505 - 508	<p>Carryout Permeability test of clayey soil (constant head, undisturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For one test)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 3.00</p> <p>b) Material Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Tray (75*75 cm) 3 Nos hour 1.00 Balance hour 1.00 Measuring Cylinder hour 1.00 Permeability app set (for 3 days) hour 72.00 Add 3 % of Labour cost for Stop watch and other T&P</p>		
5.5.10	505 - 508	<p>Carryout Permeability test of sandy soil (Constant head, disturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For one test)</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5..11	505 - 508	a) Labour		
		Engineer	day	0.10
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		oven	hour	24.00
		Can 3 Nos	hour	72.00
		Tray (75*75 cm) 3 Nos	hour	12.00
		Mould	hour	8.00
		Balance (20 kg)	hour	1.00
		Measuring Cylinder	hour	4.00
Permeability app set	hour	72.00		
Add 3 % of Labour cost for Stop watch and other T&P				
		Carryout Permeability test of sandy soil (constant head, undisturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For one test)		
5.5.12	505 - 508	a) Labour		
		Engineer	day	0.10
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	2.00
		b) Material		
		Add 3 % Labour cost for other consumable items		
		c) Equipment		
		Tray (75*75 cm) 3 Nos	hour	1.00
		Balance (2 Kg)	hour	1.00
		Measuring Cylinder	hour	1.00
		Permeability app set (for 3 days)	hour	24.00
		Add 3 % of Labour cost for Stop watch and other T&P		
				Carryout Unconfined compressive strength of undisturbed cohesive soil including all consumable and accessories as per test procedure mentioned in the Technical Specifications.
		Unit = nos (For 8 tests)		
5.5.12	505 - 508	a) Labour		
		Engineer	day	0.10
		Skilled	day	0.50
		semiskilled	day	0.75
		Unskilled	day	1.00
		b) Material		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.13	505 - 508	Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Compressive Strength testing machine	hour	8.00
		Oven	hour	24.00
		Can 6 Nos	hour	144.00
		Tray	hour	4.00
		Add 3 % of Labour cost for Vernier caliper and other T&P		
		Carryout Shear test of disturbed sample including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 4 tests)		
		a) Labour		
		Engineer	day	0.10
		Skilled	day	0.75
		semiskilled	day	1.00
Unskilled	day	1.00		
b) Material				
Add 3 % Labour cost for Gloves, masks and other consumable items				
c) Equipment				
Shear test equipment	hour	4.00		
Oven	hour	24.00		
Can 6 Nos	hour	144.00		
Tray (75*75 cm)	hour	4.00		
Balance (0.1 gm.)	hour	1.00		
Mould	hour	4.00		
5.5.14	505 - 508	Carryout Determination of Liquid Limit and Plastic Limit including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 8 tests)		
		a) Labour		
		Skilled	day	1.00
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Sieves set	hour	2.00
		Oven	hour	24.00
		Can 6 Nos	hour	144.00
		Balance(1 kg)	hour	2.00
LL apparatus	hour	2.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.15	505 - 508	<p>Carryout Los Angeles Abrasion Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 1.00</p> <p>b) Material Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Sieves set hour 3.00 Balance(20 kg) hour 2.00 LAA machine hour 3.00</p>		
5.5.16	505 - 508	<p>Carryout Aggregate Impact Value Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 0.50 Unskilled day 1.00</p> <p>b) Material Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Sieves set hour 2.00 Balance(5 kg) hour 2.00 Tray 3 Nos hour 6.00 Aggregate Impact tester hour 1.00</p>		
5.5.17	505 - 508	<p>Carryout Determination of Flakiness Index of Aggregate and impact value including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 2.00</p> <p>b) Material Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Aggregate Impact tester hour 2.00 Sieves set hour 2.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
5.5.18	505 - 508	Balance(5 kg)	hour	2.00	
		Flakiness Gauge	hour	2.00	
		Tray 3 Nos	hour	6.00	
		Carryout Determination of Specific Gravity of Soil, fine aggregate and Mineral Filler including all consumable and accessories as per test procedure mentioned in the Technical Specifications.			
		Unit = nos (For 8 tests)			
		a) Labour			
		Skilled	day	1.00	
		semiskilled	day	1.00	
		Unskilled	day	2.00	
		b) Material			
		Add 3 % Labour cost for Gloves, masks and other consumable items			
		c) Equipment			
		Sieves	hour	3.00	
		oven	hour	24.00	
Tray	hour	8.00			
Balance(2 kg)	hour	1.00			
Thermometer	hour	24.00			
Pycnometer	hour	12.00			
Hot Plate	hour	1.00			
5.5.19	505 - 508	Carryout Aggregate Crushing Value Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications.			
		Unit = nos (For 4 tests)			
		a) Labour			
		Skilled	day	0.50	
		semiskilled	day	1.00	
		Unskilled	day	2.00	
		b) Material			
		Add 3 % Labour cost for Gloves, masks and other consumable items			
		c) Equipment			
		Sieves set	hour	4.00	
		Tray 6 Nos	hour	16.00	
		Balance (20 kg)	hour	3.00	
		Crushing value apparatus	hour	4.00	
		Mould with Plunger and Base plate	hour	2.00	
Measuring cylinder	hour	4.00			
5.5.20	505 - 508	Carryout Determination of Organic Impurities of Fine Aggregate including all consumable and accessories as per test procedure mentioned in the Technical Specifications.			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unit = nos (For 4 tests) a) Labour Skilled semiskilled Unskilled b) Material Sodium Hydroxide Potassium Dichromate Sulphuric Acid Distilled Water Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Tray Balance (2 kg) Container/ can Glass Bottle (500 ml, 12 Nos) Oven		
5.5.21		505 - 508	Carryout Determination of Specific Gravity of Corse aggregates including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests) a) Labour Skilled semiskilled Unskilled b) Material Add 3 % Labour cost for Gloves, masks and other consumable items c) Equipment Sieves set Oven Tray 3 Nos Balance (5 kg) Density Basket Water Tank Pan/ can		
5.5.22		505 - 508	Carryout Stripping Value of Aggregates including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests) a) Labour Skilled semiskilled		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity		
5.5.23	505 - 508	Unskilled	day	1.00		
		b) Material				
		Tri Chloro ethylene	Lit	1.00		
		Distilled Water	Lit	1.00		
		Kerosene	Lit	1.00		
		Add 3 % Labour cost for Gloves, masks and other consumable items				
		c) Equipment				
		Oven	hour	24.00		
		Balance (5 kg)	hour	2.00		
		Tray	hour	3.00		
		Sieve set (19,12.5,9.5,6.3 mm)	hour	3.00		
		Add 3 % of Labour cost for Bowl, pan, Spatula, Beaker and other T&P				
		Carryout Determination of Mica Content on Sand (Manually) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.				
		Unit = nos (For 8 tests)				
		a) Labour				
Skilled	day					
semiskilled	day		0.50			
Unskilled	day		1.00			
b) Material						
Add 3 % Labour cost for Gloves, masks and other consumable items						
c) Equipment						
Sieve	hour		1.00			
Oven	hour		6.00			
Balance (1 kg)	hour		6.00			
Tray	hour		12.00			
Can	hour		12.00			
Add 3 % of Labour cost for Bowl, pan, Spatula, Beaker and other T&P						
5.5.24	505 - 508	Carryout Sodium Sulphate soundness (5 cycle) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.				
		Unit = nos (For 4 tests)				
		a) Labour				
		Skilled	day		1.00	
		semiskilled	day		1.50	
		Unskilled	day		1.00	
		b) Material				
		sodium Sulphate	kg		3.00	
		Barium Chloride	kg		0.50	
		Distilled water	Lit		5.00	
Add 3 % Labour cost for Gloves, masks and other consumable items						

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.25		505 - 508	c) Equipment		
			Sieve sets	hour	2.00
			water Bath for 6 days	hour	144.00
			Can 4 Nos	hour	96.00
			Container 4 nos	hour	24.00
			oven	hour	24.00
			Tray 4 Nos	hour	8.00
			Balance (2 kg)	hour	24.00
			Add 3 % of Labour cost for Thermometer and other T&P		
			Carryout Sand Equivalent Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)		
5.5.26		505 - 508	a) Labour		
			Skilled	day	1.00
			semiskilled	day	1.00
			Unskilled	day	1.00
			b) Material		
			Anhydrous Chloride	kg	0.75
			Glycerin	kg	0.20
			Formaldehyde	kg	0.15
			Distilled water	Lit	6.00
			Filter Paper	sq. ft.	1.00
Add 3 % Labour cost for Gloves, masks and other consumable items					
			c) Equipment		
			Sand Equivalent Shaker	hour	3.00
			Add 10 % of Labour cost for measuring cylinder, washing tube, Flask, Rubber tube, Funnel, Bottle, syphon assembly and other T&P		
			Carryout Bulk Density Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)		
5.5.26		505 - 508	a) Labour		
			Skilled	day	0.75
			semiskilled	day	1.00
			Unskilled	day	2.00
			b) Material		
			Add 3 % Labour cost for Gloves, masks and other consumable items		
			c) Equipment		
			Balance (20 kg)	hour	6.00
			Tray 4 Nos	hour	8.00
			oven	hour	6.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.27	505 - 508	<p>Add 10 % of Labour cost for measuring cylinder, Glass plate , tamping rod and other T&P</p> <p>Carryout Determination of moisture content by speedy Moisture meter including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 12 tests)</p> <p>a) Labour</p> <p>Skilled day 1.00</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p>b) Material</p> <p>Calcium Carbide kg 2.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Balance (1 kg) hour 3.00</p> <p>Speedy Moisture Meter hour 3.00</p> <p>M/C can 3 Nos hour 20.00</p>		
5.5.28	505 - 508	<p>Carryout Determination of Moisture content by Oven Dry Method including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 10 tests)</p> <p>a) Labour</p> <p>Engineer day 0.25</p> <p>Skilled day 0.50</p> <p>semiskilled day 0.75</p> <p>Unskilled day 1.00</p> <p>b) Material</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Balance (1 kg) hour 3.00</p> <p>oven hour 24.00</p> <p>M/C can 20 Nos hour 720.00</p> <p>Tray(50*50 cm) hour 3.00</p>		
5.5.29	505 - 508	<p>Carryout Determination of Normal consistency of cement including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 6 tests)</p> <p>a) Labour</p> <p>Skilled day 0.25</p> <p>semiskilled day 0.50</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	1.00
			b) Material Add 3 % Labour cost for Gloves, masks and other consumable items		
			c) Equipment Vicat Apparatus with needle set	hour	6.00
			Balance (1 kg)	hour	3.00
			Electric mixture with Fan and bowl set(small)	hour	3.00
			Tray	hour	3.00
			Can 18 Nos	hour	90.00
			Add 3 % of Labour cost for measuring cylinder, stop watch, thermometer and other T&P		
5.5.30		505 - 508	Carryout Determination of Setting Time Cement (Initial and Final Setting Time) including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 6 tests)		
			a) Labour Skilled	day	0.25
			semiskilled	day	0.50
			Unskilled	day	1.00
			b) Material Add 3 % Labour cost for Gloves, masks and other consumable items		
			c) Equipment Vicat Apparatus with needle set	hour	8.00
			Balance (1 kg)	hour	2.00
			Mixture (small with Fan and bowl set)	hour	2.00
			Tray	hour	8.00
			Can 6 Nos	hour	48.00
			Add 3 % of Labour cost for measuring cylinder, stop watch, thermometer and other T&P		
5.5.31		505 - 508	Making Mortar Cubes (50 mm X 50 mm) and Testing including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = set (9 Nos) [For 3 set (27 cube)]		
			a) Labour Skilled	day	0.30
			semiskilled	day	0.50
			Unskilled	day	1.00
			b) Material Distilled water	Lt	7.00
			Standard Sand	kg	6.30
			Add 3 % Labour cost for Gloves, masks and other consumable items		
			c) Equipment		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.32	505 - 508	Mixture (small)	hour	1.00
		Mould (9 Nos*3)	hour	648.00
		Compression Test Machine	hour	6.00
		Balance (5 Kg)	hour	4.50
		Curing Tank	day	28.00
		Tray (75*75 cm)	hour	4.50
		Add 3 % of Labour cost for measuring cylinder, thermometer and other T&P		
		Making Mortar Cubes (70.7 mm X 70.7 mm) and Testing including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = set (9 Nos) [For 3 set (27 cube)]		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
Distilled water	Lit	20.00		
Standard Sand	kg	18.00		
Add 3 % Labour cost for Gloves, masks and other consumable items				
c) Equipment				
Mixture (small)	hour	1.00		
Mould (9 Nos*3)	hour	648.00		
Compression Test Machine	hour	6.00		
Balance (5 Kg)	hour	4.50		
Curing Tank	day	28.00		
Tray (75*75 cm)	hour	4.50		
Add 3 % of Labour cost for measuring cylinder, thermometer and other T&P				
5.5.33	505 - 508	Carryout Slump test of Concrete including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 18 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Slump Apparatus	hour	6.00
		Tray	hour	6.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.34	505 - 508	<p>Add 3 % of Labour cost for measuring cylinder, thermometer , tamping rod, trowel and other T&P</p> <p>Carryout Determination of Fines Of Cement by Blaine's air permeability including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 3 tests)</p> <p>a) Labour</p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 1.00</p> <p>b) Material</p> <p>Filter Paper Sq. ft. 1.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Blaine's Apparatus hour 8.00</p> <p>Mixture (small) hour 1.00</p> <p>Balance (5 Kg) hour 3.00</p> <p>Can hour 24.00</p> <p>Tray (50 cm * 50 cm) hour 24.00</p> <p>Add 3 % of Labour cost for measuring cylinder, thermometer , stop watch, manometer , trowel and other T&P</p>		
5.5.35	505 - 508	<p>Carryout Compression Test for Concrete cubes and Cylinder without Capping (15 cm X 15 cm X 15 cm)mould including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 36 tests)</p> <p>a) Labour</p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p>b) Material</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Compression Test Machine hour 6.00</p> <p>Balance(20 kg) hour 6.00</p>		
5.5.36	505 - 508	<p>Making Concrete cubes (150 cm X 150 cm X 150 cm) including sample Preparation for mix design including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 18 cube)</p> <p>a) Labour</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.37	505 - 508	Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	2.00
		b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Vibrator Machine	hour	3.00
		Mould	hour	432.00
		Concrete Mixture	hour	4.00
		Sample Tray	hour	6.00
		Curing Tank	hour	1248.00
		Balance(20 kg)	hour	3.00
		Add 3 % of Labour cost for Tamping rod, shovel, plate leveler, thermometer , trowel and other T&P		
		Carryout Three edge Bearing Hume Pipe Tests,(up to 900 mm dia 2.5 m long) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
Unit = nos (For 4 tests)				
5.5.38	505 - 508	a) Labour		
		Skilled	day	1.00
		semiskilled	day	2.00
		Unskilled	day	6.00
		b) Material		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Hume pipe Testing Machine	hour	6.00
		Add 25 % Labour cost for scale for crack measurement, tripod, chain plate, iron plate, wooden beam and other T&P		
		Making Test Beam And Flexural Strength Of Concrete Beam(upto 15 cm * 15 cm *60 cm) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 4 tests)		
		a) Labour		
		Skilled	day	1.00
		semiskilled	day	2.00
Unskilled	day	6.00		
b) Material				
Add 3 % Labour cost for Gloves, masks and other consumable items				
c) Equipment				
Flexural Strength Testing Machine	hour	2.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
5.5.39	505 - 508	Mould	hour	144.00	
		Concrete Mixture	hour	6.00	
		Balance(20 kg)	hour	6.00	
		Vibrator	hour	6.00	
		Tray	hour	96.00	
		Curing Tank	hour	840.00	
		Add 3 % of Labour cost for measuring cylinder, thermometer , stop watch, , trowel and other T&P			
		Carryout Determination Of Zinc Coating Of GI Wire 7 Gauge or less dia including all consumable and accessories as per test procedure mentioned in the Technical Specifications.			
		Unit = nos (For 36 tests)			
		a) Labour			
Skilled	day	0.50			
semiskilled	day	1.00			
Unskilled	day	2.00			
b) Material					
Hydrochloric Acid	Lit.	6.00			
Antimony Chloride	gm.	200.00			
Add 10 % Labour cost for Gloves, masks and other consumable items					
c) Equipment					
Balance (1 kg)	hour	6.00			
Screw Gauge	hour	6.00			
Add 10 % of Labour cost for Beaker, Tongs, wire cutter, measuring cylinder, thermometer and other T&P					
5.5.40	505 - 508	Carryout Adhesion Test for Zinc Coating including all consumable and accessories as per test procedure mentioned in the Technical Specifications.			
		Unit = nos (For 36 test)			
		a) Labour			
		Skilled	day	0.50	
		semiskilled	day	1.00	
		Unskilled	day	2.00	
		b) Material			
		Add 10 % Labour cost for Gloves, masks and other consumable items			
		c) Equipment			
		Add 10 % of Labour cost for Beaker, Tongs, wire cutter, mandrel , thermometer and other T&P			
5.5.41	505 - 508	Carryout Uniformity Test of Zinc Coating including all consumable and accessories as per test procedure mentioned in the Technical Specifications.			
		Unit = nos (For 36 tests)			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.42		505 - 508	<p>a) Labour Skilled semiskilled Unskilled</p> <p>b) Material Copper Sulphate Distilled water Cupric Hydro oxide Trichloroethylene Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Add 10 % of Labour cost for Beaker, measuring cylinder , Tongs, wire cutter, mandrel , thermometer and other T&P</p> <p>Carryout Determination Tensile Strength Of GI Wire having dia 7 Gauge or less including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 12 tests)</p>	day day day kg Lit. gm. Lit.	0.50 1.00 2.00 0.75 2.00 3.00 0.60
5.5.43		505 - 508	<p>a) Labour Skilled semiskilled Unskilled</p> <p>b) Material Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Balance (1 kg) Tensile Testing Machine Add 10 % of Labour cost for skew gauge , wire cutter, and other T&P</p> <p>Carryout Determination Tensile Strength Of rope/ Reinforcement Steel Bars & sheets including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 6 tests)</p>	day day day hour hour	0.50 1.00 1.00 6.00 6.00
			<p>a) Labour Skilled semiskilled Unskilled</p> <p>b) Material Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Universal Testing machine</p>	day day day hour	0.50 1.00 2.00 3.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.44		505 - 508	<p>Balance (1 kg) Add 10 % of Labour cost for screw gauge , hack saw, wire cutter, and other T&P</p> <p>Carryout Marshal Stability test for prepared bituminous sample including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 12 tests)</p> <p>a) Labour Skilled day 0.50 Semiskilled day 1.00 Unskilled day 1.00</p> <p>b) Material Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Stability Testing Machine hour 3.00 Tray(75*75 cm) 4 Nos hour 12.00 Balance(5 kg) hour 1.00 Add 10 % of Labour cost for Thermometer, sample extruder and other T&P</p>		6.00
5.5.45		505 - 508	<p>Carryout Resistance to Plastic Flow and Stability of Bituminous mixture using Marshal Apparatus Inc. mix design including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 6 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 2.00 Unskilled day 2.00</p> <p>b) Material Trichloroethylene Lit. 1.50 Kerosene Lit. 4.00 Cooking Gas kg 6.00 Filter Paper Sq. ft. 4.00 Glycerin Lit. 0.20 Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Sieve sets hour 3.00 Tray hour 3.00 Mixing Machine hour 2.00 Balance(5 kg) hour 2.00 Oven hour 1.00 water Bath hour 2.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.46	505 - 508	Mould Set	hour	2.00
		Flow and Stability testing Machine	hour	2.00
		Add 10 % Labour cost for Bowl/ pan, Beaker, Spatula, scoop, Pycnometer, compactor, extruder, thermometer, gas stove, volumetric flask, suction pump and other T&P		
		Carryout Loss on Heating of Asphaltic Compound mix (Big Bowl about 2 Kg) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 9 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Trichloroethylene	Lit.	0.50
		Kerosene	Lit.	2.00
Add 10 % Labour cost for Gloves, masks and other consumable items				
c) Equipment				
Oven	hour	1.00		
Can	hour	45.00		
Balance (2 kg)	hour	2.00		
Add 10 % Labour cost for Bowl/ pan, Beaker, thermometer, gas stove/ heater, and other T&P				
5.5.47	505 - 508	Carryout Determination of bitumen Content of pavement Mix (2 kg bowl) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 4 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Trichloroethylene	Lit.	11.00
		Kerosene	Lit.	2.00
		Cooking Gas	kg	3.00
		Filter Paper	Sq. ft.	3.00
		Glycerin	Lit.	0.10
Add 10 % Labour cost for Gloves, masks and other consumable items				
c) Equipment				
Centrifugal machine	hour	6.00		
Oven	hour	6.00		
Tray(75*75 cm)	hour	3.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.48	505 - 508	Balance (2 kg)	hour	1.00
		Add 10 % Labour cost for Bowl/ pan, Beaker, thermometer, gas stove/ heater, and other T&P		
		Carryout Determination of bitumen Content of pavement Mix (small bowl about 1 kg) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 4 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Trichloroethylene	Lit.	8.00
		Kerosene	Lit.	2.00
		Cooking Gas	kg	1.50
		Filter Paper	Sq. ft.	3.00
		Glycerin	Lit.	0.10
Add 10 % Labour cost for Gloves, masks and other consumable items				
c) Equipment				
Centrifugal machine	hour	6.00		
Oven	hour	6.00		
Tray (75*75 cm)	hour	3.00		
Balance (2 kg)	hour	1.00		
Add 10 % Labour cost for Bowl/ pan, Beaker, thermometer, gas stove/ heater, and other T&P				
5.5.49	505 - 508	Carryout Determination of Flash point and fire point of asphalt (Cleveland open cup) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.		
		Unit = nos (For 8 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Trichloroethylene	Lit.	0.50
		Cooking Gas	kg	2.00
		Glycerin	Lit.	0.10
		Add 10 % Labour cost for Gloves, masks and other consumable items		
c) Equipment				
Cleveland open cup	hour	4.00		
Oven	hour	4.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.50	505 - 508	<p>Add 10 % Labour cost for gas stove/ heater, Thermometer and other T&P</p> <p>Carryout Solubility Test of Bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 1.00</p> <p>b) Material Trichloroethylene Lit. 2.00 Filter Paper Sq. ft. 4.00 Glycerin Lit. 0.50</p> <p>Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Solubility machine hour 6.00 Balance (1 kg) hour 6.00</p> <p>Add 10 % Labour cost for gas stove/ heater, Thermometer, Vacuum pump and other T&P</p>		
5.5.51	505 - 508	<p>Carryout Penetration Test of Bitumen/ Penetration of Residue after loss on heating Test of Bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 1.00</p> <p>b) Material Trichloroethylene Lit. 0.50 Glycerin Lit. 0.25</p> <p>Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Penetrometer hour 2.00 Constant Temp Water Bath hour 4.00</p> <p>Add 10 % Labour cost for gas stove/ heater, Thermometer, and other T&P</p>		
5.5.52	505 - 508	<p>Carryout Softening point test of bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)</p> <p>a) Labour Skilled day 0.50</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity		
5.5.53		505 - 508	semiskilled	day	1.00		
			Unskilled	day	1.00		
			b) Material				
			Trichloroethylene	Lit.	0.25		
			Glycerin	Lit.	0.25		
			Add 10 % Labour cost for Gloves, masks and other consumable items				
			c) Equipment				
			Ring and Ball Apparatus	hour	3.00		
			Add 10 % Labour cost for gas stove/ heater, Thermometer, Pouring plate and other T&P				
			Carryout Ductility Test of Bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications.				
			Unit = nos (For 8 tests)				
			a) Labour				
			Skilled	day	0.50		
			semiskilled	day	1.00		
Unskilled	day	1.00					
b) Material							
Trichloroethylene	Lit.	0.25					
Glycerin	Lit.	0.25					
Add 10 % Labour cost for Gloves, masks and other consumable items							
c) Equipment							
Ductility Test Machine with water bath	hour	4.00					
Mould with brass plate	hour	9.00					
Add 10 % Labour cost for gas stove/ heater, Thermometer, Pouring plate and other T&P							
5.5.54		505 - 508	Carryout Determination of Water content in Asphalt including all consumable and accessories as per test procedure mentioned in the Technical Specifications.				
			Unit = nos (For 8 tests)				
			a) Labour				
			Skilled	day	0.50		
			semiskilled	day	1.00		
			Unskilled	day	1.00		
			b) Material				
			Trichloroethylene	Lit.	0.50		
			Cooking Gas	kg	2.00		
			Xylene	Lit.	0.60		
			Glycerin	Lit.	0.50		
			Add 10 % Labour cost for Gloves, masks and other consumable items				
			c) Equipment				
			Glass Distillation flask with Liebig	hour	8.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.55	505 - 508	Add 10 % Labour cost for gas stove/ heater, Thermometer, Pouring plate and other T&P		
		Carryout Determination of Specific gravity of Asphalt including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Trichloroethylene	Lit.	0.25
		Kerosene	Lit.	1.00
		Distilled water	Lit.	1.00
		Glycerin	Lit.	0.25
		Add 10 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
		Pycnometer	hour	6.00
Balance (1 kg)	hour	2.00		
water Bath	hour	6.00		
Oven	hour	1.00		
Add 10 % Labour cost for Beaker, gas stove/ heater, Thermometer and other T&P				
5.5.56	505 - 508	Carryout Determination of Viscosity of Bitumen (Absolute) including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)		
		a) Labour		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		b) Material		
		Trichloroethylene	Lit.	0.50
		Kerosene	Lit.	4.00
		Sulphuric Acid	Lit.	0.50
		Sodium Dichromate	gm.	250.00
		Distilled water	Lit.	0.50
		Silicon bath oil/ Glycerin	Lit.	0.50
		Add 10 % Labour cost for Gloves, masks and other consumable items		
		c) Equipment		
cannon Manning vacuums Viscometer	hour	6.00		
Oven	hour	6.00		
Constant Temp Water Bath	hour	6.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.57	505 - 508	<p>Add 10 % Labour cost for Stop watch, Beaker, gas stove/ heater, Thermometer and other T&P</p> <p>Carryout Determination of Viscosity of Bitumen (Kinematic) including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 4 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 1.00 Unskilled day 1.00</p> <p>b) Material Trichloroethylene Lit. 0.50 Kerosene Lit. 4.00 Sulphuric Acid Lit. 0.50 Sodium Dichromate gm. 250.00 Distilled water Lit. 0.50 Silicon bath oil/ Glycerin Lit. 0.50 Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment BS U-Tube Modified Reverse Flow Viscometers hour 8.00 Constant Temp Water Bath hour 8.00 Oven hour 8.00 Add 10 % Labour cost for Stop watch, Beaker, gas stove/ heater, Thermometer and other T&P</p>		
5.5.58	505 - 508	<p>Carryout Binder Content of emulsion including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)</p> <p>a) Labour Skilled day 0.50 semiskilled day 0.50 Unskilled day 1.00</p> <p>b) Material Kerosene Lit. 4.00 Xylene Lit. 0.50 Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment Dean and Stark Apparatus hour 8.00 Hot plate with Regulator hour 8.00 Balance (5 kg) hour 2.00 Add 10 % Labour cost for steering rod, Beaker, gas stove/ heater, Thermometer and other T&P</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.59		505 - 508	<p>Carryout Determination of Residue on Sieving of Emulsion including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 8 tests)</p> <p>a) Labour</p> <p>Skilled day 0.50</p> <p>semiskilled day 0.50</p> <p>Unskilled day 1.00</p> <p>b) Material</p> <p>Xylene Lit. 1.60</p> <p>Hydrochloric Acid Lit. 0.40</p> <p>Centrimide Lit. 0.20</p> <p>Acetone Lit. 1.20</p> <p>Kerosene Lit. 2.00</p> <p>Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Sieve (710 micron) hour 6.00</p> <p>Oven hour 3.00</p> <p>Balance (1 kg) hour 4.00</p> <p>Add 10 % Labour cost for Beaker, Container, measuring cylinder, Thermometer and other T&P</p>		
5.5.60		505 - 508	<p>Carryout Determination of Engler Viscosity Emulsion including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</p> <p>Unit = nos (For 4 tests)</p> <p>a) Labour</p> <p>Skilled day 0.50</p> <p>semiskilled day 0.50</p> <p>Unskilled day 1.00</p> <p>b) Material</p> <p>Trichloroethylene Lit. 0.50</p> <p>Distilled water Lit. 1.00</p> <p>Kerosene Lit. 1.50</p> <p>Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p>c) Equipment</p> <p>Engler Viscometer hour 3.00</p> <p>Sieve (710 micron) hour 2.00</p> <p>Add 10 % Labour cost for Beaker, Receiving flask, Container, Pipette, Stop watch , measuring cylinder, Thermometer and other T&P</p>		

SECTION 600 - MATERIAL AND TESTING OF MATERIALS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			REFER NORMS AND RATES OF SECTION 500		

SECTION 700 - PIPE DRAIN, PIPE CULVERTS AND CONCRETE

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
7.1	A	701	<p>Providing, jointing and laying HDPE pipes with or without collar etc. complete in place as per Drawing and Technical Specifications.</p> <p>a) 110 mm/125 mm outer dia.</p> <p><i>Unit = meter (For 50 meter)</i></p> <p>a) Labour Skilled day 3.00 Unskilled day 3.00</p> <p>b) Material HDPE pipe / HDPE pipe with collars meter 50.00</p> <p>c) Equipment Generator hour 6.00 screw Jack hour 6.00 Electric heating plate hour 6.00 Add 3 % of Labour cost for other T&P</p>		
	Remarks		<p>1. The rate analysis does not include excavation, backfilling pipe bedding and ancillary works, which shall be estimate using Norms of related items</p> <p>2. For other diameter of pipe derive Norms by Interpolation / Extrapolation on the basis of pipe perimeter.</p> <p>3. Generator and electric heating plate can be replaced by 5 numbers of blow lamps for rate analysis.</p>		
7.2	A	701	<p>Providing and Laying Reinforced Cement Concrete Flush jointed Pipe for culverts</p> <p>Providing and Laying Reinforced cement concrete NP3 Flush jointed pipe for culverts including fixing with cement mortar 1:2 as per Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 12.5 m. 5 pipes of 2.5 m length each)</i></p> <p>300 mm internal dia.</p> <p>a) Labour Skilled day 1.00 Unskilled day 5.00</p> <p>b) Material Sand cum 0.08 Cement tonne 0.06 RCC pipe meter 12.50</p> <p>c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p>		
	B		<p>450 mm internal dia.</p> <p>a) Labour Skilled day 1.00 Unskilled day 6.00</p> <p>b) Material Sand cum 0.09 Cement tonne 0.07 RCC pipe meter 12.50</p> <p>c) Equipment</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	C		<p>Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p> <p>600 mm internal dia.</p> <p>a) Labour Skilled day 1.00 Unskilled day 7.00</p> <p>b) Material Sand cum 0.10 Cement tonne 0.08 RCC pipe meter 12.50</p> <p>c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p>		
	D		<p>900 mm internal dia.</p> <p>a) Labour Skilled day 1.00 Unskilled day 8.00</p> <p>b) Material Sand cum 0.12 Cement tonne 0.09 RCC pipe meter 12.50</p> <p>c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p>		
	E		<p>1000 mm internal dia.</p> <p>a) Labour Skilled day 1.50 Unskilled day 10.00</p> <p>b) Material Sand cum 0.14 Cement tonne 0.10 RCC pipe meter 12.50</p> <p>c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p>		
	F		<p>1200 mm internal dia.</p> <p>a) Labour Skilled day 2.00 Unskilled day 12.00</p> <p>b) Material Sand cum 0.18 Cement tonne 0.14 RCC pipe meter 12.50</p> <p>c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p>		
	Remarks		1. The rate analysis does not include excavation, backfilling pipe bedding and ancillary works, which shall be estimated using Norms of related items.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity			
7.3	A	701	2. For other diameter of pipe derive Norms by Interpolation / Extrapolation on the basis of pipe perimeter.					
			3. In case of Spigot and Socket ended pipes and other grade of pipes such as NP2, NP4 rate of related pipes shall be used to find Rate.					
			Providing and Laying Reinforced Cement Concrete Pipe for culverts including fixing collar					
			Providing and Laying Reinforced cement concrete NP3 Collar jointed pipe for culverts including fixing collar with cement mortar 1:2 as per Drawing and Technical Specifications.					
			<i>Unit = meter (For 12.5 m, 5 pipes of 2.5 m length each)</i>					
			300 mm internal dia.					
			a) Labour					
			Skilled	day	1.00			
			Unskilled	day	5.00			
			b) Material					
			Sand	cum	0.08			
			Cement	tonne	0.06			
			RCC pipe	meter	12.50			
			RCC Collar	nos.	4.00			
			c) Equipment					
Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P								
B	701	701	450 mm internal dia.					
			a) Labour					
			Skilled	day	1.00			
			Unskilled	day	6.00			
			b) Material					
			Sand	cum	0.09			
			Cement	tonne	0.07			
			RCC pipe	meter	12.50			
			RCC Collar	nos.	4.00			
			c) Equipment					
			Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P					
			C	701	701	600 mm internal dia.		
						a) Labour		
						Skilled	day	1.00
						Unskilled	day	7.00
b) Material								
Sand	cum	0.10						
Cement	tonne	0.08						
RCC pipe	meter	12.50						

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			RCC Collar	nos.	4.00
			c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P		
	D		900 mm internal dia.		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	8.00
			b) Material		
			Sand	cum	0.12
			Cement	tonne	0.09
			RCC pipe	meter	12.50
			RCC Collar	nos.	4.00
			c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P		
	E		1000 mm internal dia.		
			a) Labour		
			Skilled	day	1.50
			Unskilled	day	10.00
			b) Material		
			Sand	cum	0.14
			Cement	tonne	0.10
			RCC pipe	meter	12.50
			RCC Collar	nos.	4.00
			c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P		
	F		1200 mm internal dia.		
			a) Labour		
			Skilled	day	2.00
			Unskilled	day	12.00
			b) Material		
			Sand	cum	0.18
			Cement	tonne	0.14
			RCC pipe	meter	12.50
			RCC Collar	nos.	4.00
			c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P		
	Remarks		1. The rate analysis does not include excavation, backfilling pipe bedding and ancillary works, which shall be estimated using Norms of related items.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
7.4	702	<p>2. For other diameter of pipe derive Norms by Interpolation / Extrapolation on the basis of pipe perimeter.</p> <p>Providing and laying concrete channeling as per Drawing and Technical Specifications.</p> <p>A Cast in situ Refer Rate analysis of concrete items</p> <p>B Pre cast Refer Rate analysis of concrete items</p> <p>C Laying (Joining) of Precast concrete panel <i>Unit = meter [For 12 m. (2 nos 60 cm wide and 60 cm deep channel) of perimeter</i></p> <p>a) Labour Skilled day 0.50 Unskilled day 3.00</p> <p>b) Material Sand cum 0.04 Cement tonne 0.03 Concrete channel nos.</p> <p>c) Equipment Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P</p>		
	Remarks	1. The rate analysis does not include rate of concrete channel ,excavation, backfilling and ancillary works, which shall be estimated using Norms of related items.		

NORMS FOR RATE ANALYSIS

SECTION - 800 COLLECTION AND TRANSPORTATION OF

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.1		800	Collection and sieving gravel including stacking within 10 m. Hauling distance.		
	A		5 mm - 70 mm Unit = cum (For 1 cum) a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants	day	2.00
	B		40 mm Unit = cum (For 1 cum) a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants	day	3.00
	C		20 mm Unit = cum (For 1 cum) a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants	day	4.00
	D		8 mm Unit = cum (For 1 cum) a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants	day	6.00
	E		Size 40 mm - 70 mm Unit = cum (For 1 cum) a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants	day	4.00
	F		Size 70 mm - 100 mm Unit = cum (For 1 cum) a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants	day	3.00
8.2			Collection of rubble of required size, hauling distance 10 m. and stacking. Unit = cum (For 1 cum)		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.3	A		a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants Collection and sieving sand . Quarry output less than 33% Unit = cum (For 1 cum)	day	1.40
	B		a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants Quarry output 33 - 66% Unit = cum (For 1 cum)	day	4.00
	C		a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants Quarry output more than 66% Unit = cum (For 1 cum)	day	3.00
	D		a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants Collection, quarrying and sieving sand in local river Unit = cum (For 1 cum)	day	1.50
8.4	A		Washing of Construction Material Washing broken stone gravel and sand. Unit = cum (For 1 cum)		
	B		a) Labour Unskilled b) Equipment Add 3 % of Labour cost for Tools and Plants Washing Rubble Unit = cum (For 1 cum)	day	0.50
			a) Labour Unskilled b) Equipment	day	0.20

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.5			Add 3 % of Labour cost for Tools and Plants		
	A		Manually Breaking stones (excluding Collection of Rubble) 70 mm - 100 mm Unit = cum (For 1 cum) a) Labour Unskilled	day	1.50
	B		b) Equipment Add 3 % of Labour cost for Tools and Plants 40 mm - 70 mm Unit = cum (For 1 cum) a) Labour Unskilled	day	2.00
	C		b) Equipment Add 3 % of Labour cost for Tools and Plants 20 mm - 40 mm Unit = cum (For 1 cum) a) Labour Unskilled	day	3.00
	D		b) Equipment Add 3 % of Labour cost for Tools and Plants 10 mm - 20 mm Unit = cum (For 1 cum) a) Labour Unskilled	day	4.00
	E		Add 3 % of Labour cost for Tools and Plants 10 mm Unit = cum (For 1 cum) a) Labour Unskilled	day	6.00
8.6	A		Mechanically Crushing of Stone Aggregates 13.2 mm Nominal Size. Assumption: Crushing of stone boulders of 150 mm size in an integrated stone crushing unit comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 13.2 mm nominal size. Unit = cum (For 600 cum at crusher location)		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	B		<p>a) Labour Skilled Unskilled</p> <p>b) Material Stone Boulder of size 150 mm and below</p> <p>c) Equipment Stone crusher with screen Loader Tipper</p> <p>20 mm Nominal Size Assumption: Crushing of stone boulders of 150 mm size in an integrated stone crushing unit comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 20 mm nominal size.</p> <p>Unit = cum (For 670 cum at crusher location)</p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Stone Boulder</p> <p>c) Equipment Stone crusher with screen Loader Tipper</p>	day day cum hour hour hour day day cum hour hour hour	2.00 18.00 800.00 12.00 18.00 18.00 2.00 18.00 800.00 18.00 18.00 18.00
	C		<p>40 mm Nominal Size Assumption: Crushing of stone boulders of 150 mm size in an integrated stone crushing unit comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 40 mm nominal size.</p> <p>Unit = cum (For 750 cum at crusher location.)</p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Stone Boulder</p> <p>c) Equipment Stone crusher with screen Loader Tipper</p>	day day cum hour hour hour	2.00 17.00 800.00 6.00 20.00 20.00
8.7	A		<p>Making rubbles of required size including and stacking. with blasting and breaking with chisel or hammer,</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.8	B		<p>Unit = cum (For 1 cum)</p> <p>a) Labour</p> <p>Skilled (Blaster) day 0.10</p> <p>Unskilled day 2.50</p> <p>b) Material</p> <p>Gelatin kg 0.25</p> <p>Detonator no 2.00</p> <p>Fuse wire meter 2.00</p> <p>b) Equipment</p> <p>Add 3 % of Labour cost for traffic control sign and other T&P</p> <p>With chisel or hammer, and stacking (without blasting).</p> <p>Unit = cum (For 1 cum)</p> <p>a) Labour</p> <p>Skilled (Blaster) day 0.10</p> <p>Unskilled day 4.00</p> <p>b) Material</p> <p>c) Equipment</p> <p>Add 3 % of Labour cost for traffic control sign and other T&P</p>		
		Remarks:	<p>Haulage of Stone Boulder/ aggregates/ Sand/ excavated earth etc.</p> <p>Unit = cum (For 50% by basket and 50% by wheel barrow for every additional 20 m haul. = 1 cum, 100 m)</p> <p>a) Labour</p> <p>Unskilled day 0.20</p> <p>b) Equipment</p> <p>Add 3 % of Labour cost for traffic control sign and other T&P</p>		
8.9	A		<p>Loading and Unloading of Stone Boulder/ aggregates/ Sand/ excavated earth etc. by Mechanical; means</p> <p>Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip</p> <p>Unit = cum (For 5.5 cum)</p> <p>Time required for</p> <p>i) Positioning of tipper at loading point 1 Min</p> <p>ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour 13 Min</p> <p>iii) Maneuvering, reversing, dumping and turning for return 2 Min</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			iv) Waiting time, unforeseen contingencies etc. Total		4 Min 20 Min
			a) Equipment Tipper Loader	hour hour	0.33 0.33
	Remarks:		Unloading will be by tipping.		
	B		by Manual Means Unit = cum [For 44 cum (8 trip per day having 5.5 cum each)]		
			a) Labour Unskilled	day	6.00
			b) Equipment Tipper	hour	6.00
	Remarks:		Unloading will be by tipping.		
8.10			Loading and Unloading of Cement or Steel by Manual Means and Stacking. Unit = tonne (For 10 tones)		
			a) Labour Unskilled	day	2.00
			b) Equipment Truck	hour	2.00
8.11			Loading, Unloading and Stacking of Bricks by Manual Means Unit = 1000 Nos. (For 8 * 2000 nos.)		
			a) Labour Unskilled	day	3.00
			b) Equipment Truck	hour	6.00
8.12			Loading and Unloading of Bitumen Drums by Manual Means Unit = tonne (For 40 tonnes)		
			a) Labour Unskilled	day	6.00
			b) Equipment Truck	hour	6.00
8.13			Loading and Unloading of Timber by Manual Means Unit = tonne (for 30 tonnes)		
			a) Labour Skilled	day	1.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.14			Unskilled	day	8.00
			b) Equipment Truck	hour	6.00
			Remarks : Density of wood has been assumed as 900 kg per cum. If the density is less the output may be reduced proportionately.		
			Loading and Unloading of C.C. Blocks, Kerb, etc. Unit = cum (For 20 cum)		
			a) Labour Skilled	day	1.00
			Unskilled	day	8.00
			b) Equipment Truck	hour	6.00
8.15	i A		Loading and Unloading of RCC Hume Pipes Loading of RCC Hume pipes by mechanical means including a lead upto 30 m 900/ 1000 / 1200 mm dia RCC Hume pipe Unit = meter [For 6 nos pipe / length=15 m]		
			a) Labour Skilled	day	0.50
			Unskilled	day	2.00
			b) Equipment Truck	hour	1.00
			Crane (3 T)	hour	1.00
			750/600/450 mm dia RCC Hume pipe Unit = meter [For 10 nos pipe/ length= 25 m]		
			a) Labour Skilled	day	0.50
			Unskilled	day	2.00
			b) Equipment Truck	hour	1.00
			Crane	hour	1.00
	B		450/300 mm dia RCC Hume pipe Unit = meter [For 15 nos pipe/ length= 37.5 m]		
	C		a) Labour Skilled	day	0.50
			Unskilled	day	2.00
			b) Equipment Truck	hour	1.00
			Crane	hour	1.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
ii	A		Unloading of RCC Hume pipes by mechanical means including a lead upto 30 m			
			900/1000/1200 mm dia RCC Hume pipe			
			Unit = meter [For 6 nos pipe /length=15 m]			
			a) Labour			
			Skilled	day	0.10	
			Unskilled	day	1.00	
		B		750/600 mm dia RCC Hume pipe		
	Unit = meter [For 10 nos pipe / length = 25 m]					
	a) Labour					
	Skilled			day	0.50	
	Unskilled			day	1.00	
	b) Equipment					
Truck	hour	0.50				
Crane	hour	0.50				
	C		450/300 mm dia RCC Hume pipe			
Unit = meter [For 15 nos pipe / length= 37.5 m]						
a) Labour						
Skilled			day	0.10		
Unskilled			day	1.00		
b) Equipment						
Truck	hour	0.50				
Crane	hour	0.50				
iii	A		Loading of RCC Hume pipe by manual means including a lead upto 30 m			
			900/1000/1200 mm dia RCC Hume pipes			
			Unit = meter [For 6 nos pipe / length= 15 m]			
			a) Labour			
			Skilled	day	0.30	
			Unskilled	day	3.00	
		B		750/600 mm dia RCC Hume pipe		
	Unit = meter [For 10 nos pipe/ length= 25 m]					
	a) Labour					
	Wooden sleepers 250 mm x 250 mm x 125 mm hire charges 3 Nos sleeper			hour	4.00	
	Add 3 % of Labour cost for Crow bars and other T&P					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Skilled	day	0.30
			Unskilled	day	4.00
			b) Equipment		
			Truck	hour	4.00
			c) Material		
			Wooden sleepers 250 mm x 250 mm x 125 mm hire charges 3 Nos sleeper Add 3 % of Labour cost for Crow bars and other T&P	hour	4.00
	C		450 / 300 mm dia RCC Hume pipe Unit = meter [For 15 nos pipe/ length= 37.5 m]		
			a) Labour		
			Skilled	day	0.30
			Unskilled	day	5.00
			b) Equipment		
			Truck	hour	4.00
			c) Material		
			Wooden sleepers 250 mm x 250 mm x 125 mm hire charges 3 Nos sleeper Add 3 % of Labour cost for Crow bars and other T&P	hour	4.00
	iv		Unloading of RCC Hume pipe by manual means including a lead upto 30 m		
	A		900/1000/1200 mm dia RCC Hume pipes Unit = meter [For 6 nos pipe / length= 15 m]		
			a) Labour		
			Skilled	day	0.30
			Unskilled	day	1.50
			b) Equipment		
			Truck	hour	3.00
			c) Material		
			Wooden sleepers 250 mm x 250 mm x 125 mm hire charges 3 Nos sleeper Add 3 % of Labour cost for Crow bars and other T&P	hour	3.00
	B		750/600 mm dia RCC Hume pipe Unit = meter [For 10 nos pipe / length= 25 m]		
			a) Labour		
			Skilled	day	0.30
			Unskilled	day	1.50
			b) Equipment		
			Truck	hour	3.00
			c) Material		
			Wooden sleepers 250 mm x 250 mm x 125 mm hire charges 3 Nos sleeper	hour	3.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity													
8.16	C		Add 3 % of Labour cost for Crow bars and other T&P															
			<p>450 / 300 mm dia RCC Hume pipe Unit = meter [For 15 nos pipe / length=37.5 m]</p> <p>a) Labour Skilled day 0.30 Unskilled day 1.50</p> <p>b) Equipment Truck hour 3.00</p> <p>c) Material Wooden sleepers 250 mm x 250 mm x 125 mm hire charges 3 Nos sleeper Add 3 % of Labour cost for Crow bars and other T&P</p>															
			<p>Cost of Haulage Excluding Loading and Unloading Haulage of materials by tipper excluding cost of loading, unloading and stacking. Unit = t.km (For 8 tones load and lead 10 km = 80 t.km)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>ER</td> <td>GR</td> <td>BT</td> </tr> <tr> <td>Speed of loaded truck</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Terai</td> <td>20</td> <td>30</td> <td>40</td> </tr> <tr> <td>Mountain</td> <td>10</td> <td>15</td> <td>20</td> </tr> </table>		ER	GR	BT	Speed of loaded truck				Terai	20	30	40	Mountain	10	15
	ER	GR	BT															
Speed of loaded truck																		
Terai	20	30	40															
Mountain	10	15	20															
	(i)		<p>Speed of Empty truck =25 % more than loaded truck of corresponding terrain Blacktop Road, hilly terrain Speed with load : 20 km / hour. Speed while Returning empty : 25 km / hour.</p> <p>a) Equipment. Tipper Time taken for onward haulage with load hour 0.50 Time taken for empty return trip. hour 0.40</p>															
	(ii)		<p>Graveled Road, hilly terrain Speed with load: 15 km / hour Speed for empty return trip :18.75 km / hour</p> <p>a) Equipment Tipper Time taken for onward haulage with load hour 0.67 Time taken for empty return trip hour 0.53</p>															
	(iii)		<p>Earthen Track and Track in River Bed/Nallah Bed , hilly terrian Speed with load : 10 km / hour Speed while returning empty: 12.5 km / hour</p>															

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		a) Equipment Tipper Time taken for onward haulage Time taken for empty return trip	hour hour	1.00 0.80
(iv)		Blacktop Road, Terai terrain Speed with load : 40 km / hour. Speed while Returning empty : 50 km / hour. a) Equipment. Tipper Time taken for onward haulage with load Time taken for empty return trip.	hour hour	0.25 0.20
(v)		Graveled Road, Terai terrain Speed with load: 30 km / hour Speed for empty return trip : 37.5 km / hour a) Equipment for transportation Tipper Time taken for onward haulage with load Time taken for empty return trip	hour hour	0.33 0.27
(vi)		Earthen Track and Track in River Bed/Nallah Bed , Terai Speed with load : 20 km / hour Speed while returning empty: 25 km / hour a) Equipment for transportation Tipper Time taken for onward haulage Time taken for empty return trip	hour hour	0.50 0.40
	Remarks:	Speed of vehicle may be modified as per site condition		

SECTION 900 - EARTH WORKS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
9.1	I A	905	Earthwork Excavation in Cutting.		
			Roadway Excavation in All types of Soil		
	Roadway Excavation in all types of Soil by Manual Means .				
	Roadway Excavation in all types of soil as per drawing and technical specification, including removal of stumps and other deleterious matter, with all lifts and lead as per Drawing and instruction of the Engineer.				
			<i>Unit = cum (For 12 cum)</i>		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	8.00
			b) Equipment		
			Doko , Thunse etc. @ 3 % of Labour cost		
	B		Roadway Excavation in all types of Soil by Mechanical Means .		
			Road way Excavation in all types of soil as per Drawing and technical specifications including removal of stumps and other deleterious matter, all lifts and lead as per Drawing and instruction of the Engineer.		
			<i>Unit = cum (For 360 cum)</i>		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	3.00
			b) Equipment		
			Hydraulic excavator	hour	6.00
	II A		Roadway Excavation in Ordinary Rock		
			Roadway Excavation in ordinary rock by Manual Means .		
			Roadway Excavation in ordinary rock as per Drawing and Technical specification, including all lift and lead as per Drawing and instruction of the Engineer.		
			<i>Unit = cum (For 60 cum)</i>		
			a) Labour		
			Skilled	day	3.00
			Unskilled	day	50.00
			b) Equipment		
			Doko , Thunse etc. @ 3 % of Labour cost		
	B		Roadway Excavation in ordinary rock by Mechanical Means .		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity		
III A		Roadway Excavation in ordinary rock as per Drawing and Technical specification, including all lift and lead as per Drawing and instruction of the Engineer. <i>Unit = cum (For 120 cum)</i>				
		a) Labour				
		Skilled	day	1.00		
		Unskilled	day	3.00		
		b) Equipment				
		Hydraulic excavator	hour	6.00		
		Roadway Excavation in Hard Rock				
		Roadway Excavation in Hard Rock, mechanical Drilling				
		Roadway Excavation in hard rock with mechanical drilling, including blasting and breaking, and disposal of cut road within all lifts and leads as per Drawing and instruction of the Engineer. <i>Unit = cum (for 90 cum)</i>				
		a) Labour				
		Skilled	day	1.00		
		Unskilled	day	20.00		
		Driller	day	3.00		
		Blaster	day	1.00		
		b) Material				
Gelatin	kg	32.00				
Electric Detonators	nos.	126.00				
Fuse wire	meter	180.00				
Credit for excavated rock for use @ 50 per cent of excavated (if available rock is used)	cum	(45.00)				
c) Equipment						
Dozer	hour	6.00				
Jack hammer /Rock drill	hour	30.00				
Air compressor	hour	12.00				
B		Excavation in Hard Rock, manual Drilling				
		Roadway excavation in hard rock with manual drilling, blasting, breaking, lifts and leads all complete as per Drawing and instruction of the Engineer. <i>Unit = cum (for 90 cum)</i>				
		a) Labour				
		Skilled	day	3.00		
		Unskilled	day	150.00		
		Blaster	day	1.00		
		b) Material				
		Gelatin	kg	32.00		
		Electric Detonators	nos.	126.00		
		Fuse wire	meter	180.00		
		Credit for excavated rock for use @ 50 per cent of excavated (if available rock is used)	cum	(45.00)		
		c) Equipment				
		Crow bar and other T & P @ 3 % of Labour				
		IV		Excavation in Hard Rock (blasting prohibited)		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
	A		<p>Roadway Excavation in hard rock with rock breakers, including breaking rock, lifts and lead for disposal as per Drawing and Technical Specifications Mechanical method, lead upto 30 m <i>Unit = cum (For 16 cum)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 10.00</p> <p>b) Equipment Hydraulic excavator with rock breaker attachment hour 6.00</p> <p>Credit for excavated rock for use @ 50 per cent of excavated (if available rock is used) cum (8.00)</p>		
	B		<p>Roadway Excavation in hard rock manually chiseling including breaking rock, lifts and lead for disposal as per Drawing and Technical Specifications , <i>Unit = cum (For 16 cum)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 58.00 Blacksmith day 1.00</p> <p>b) Equipment Crow bar and other T & P @ 3 % of Labour Credit for excavated rock for use @ 50 per cent of excavated (if available rock is used) cum (8.00)</p>		
	C		<p>Roadway Excavation in hard rock manually with use of chemical, including breaking rock, disposal within all lifts and lead as per Drawing and Technical Specifications <i>Unit = cum (For 16 cum)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 16.00</p> <p>b) Material Chemical kg 80.00 Credit for excavated rock for use @ 50 per cent of excavated (if available rock is used) cum (8.00)</p> <p>c) Equipment Crow bar and other T & P @ 3 % of Labour</p>		
	V		<p>Excavation in Marshy Soil Roadway Excavation in marshy soil as per Drawing and Technical Specifications <i>Unit = cum (For 300 cum)</i></p> <p>a) Labour</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
		skilled	day	1.00
		Unskilled	day	4.00
		b) Equipment		
		Hydraulic excavator	hour	6.00
		Tipper	hour	18.00
		Remarks for Activities of 9.1 :		
		1 In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.		
		2 The quality and availability of rock shall be checked before affording credit for available rock, if rock can not used do not include credit for excavated rock.		
		3 If disposal lead is more than 30 m separate activity for haulage may be included.		
		4 In case some rock is used by the Contractor at site, the item of carriage shall be omitted to the extent of quantity is used by the contractor.		
		5 in case of use of Blasting (explosive) material add Cost for security personal for handling and storage of explosive		
		6 If case of mountainous terrain (having cross slope 25 - 60 percent) add 5 % on above rate.		
		7 If case of Steep terrain (having cross slope more than 60 percent) add 10 % on above rate.		
9.2	905	Removal of Unserviceable Soil with Disposal upto 1000 meters Removal of unserviceable soil including excavation, loading and disposal upto 1000 meters lead <i>Unit = cum (For 360 cum)</i> a) Labour Skilled Unskilled b) Equipment Excavator Tipper	day day hour hour	1.00 4.00 6.00 18.00
		Remarks This item does not include replacement of unsuitable soil by suitable soil. Replacement, where required, is to be provided and paid separately		
9.3	900	Trimming/ Rock Excavation Slopes		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
			<p>Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by machine, with all lifts and lead as per Drawing and instruction of the Engineer. <i>Unit = sqm [For 400 sqm(120 cum considering 300 mm deep excavation on rock face)]</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 22.00</p> <p>b) Material Gelatin kg 42.00 Electric Detonators nos. 672.00</p> <p>c) Equipment Air compressor hour 6.00 Jack hammer /Rock drill hour 30.00 Dozer hour 6.00 Loader hour 6.00</p>		
			<p>Remarks</p> <p>In case blasted rock is used to the contractor against payment for constructed work, the cost of disposal shall be reduced to that extent.</p>		
9.4		907	<p>Excavation for Structures Foundation Earth work in excavation of foundation of structures, including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Material as per Drawing and Technical Specifications. Ordinary soil Manual Means <i>Unit = cum (For 10 cum)</i> Depth upto 3 m</p> <p>a) Labour Skilled day 1.00 Unskilled day 8.00</p>		
	I A (i)		<p>Remarks</p> <p>1. Cost of dewatering may be added where required upto, 10 per cent of Labour cost Assessment for dewatering shall be made as per site conditions.</p> <p>2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 9.1 excluding marshy soil.</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
	(ii)	<p>3. The cost of shoring and shuttering, if needed, may be added @ 1 per cent on cost of excavation for open foundation.</p> <p>Depth 3 m to 6 m</p> <p>a) Labour</p> <p>Skilled</p> <p>Unskilled</p>	<p>day</p> <p>day</p>	<p>1.00</p> <p>12.00</p>
	Remarks	Cost of dewatering may be added where required upto 15 per cent of Labour cost. Assessment for dewatering shall be done as per actual ground conditions.		
	(iii)	<p>Depth above 6 m</p> <p>a) Labour</p> <p>Skilled</p> <p>Unskilled</p>	<p>day</p> <p>day</p>	<p>2.00</p> <p>18.00</p>
	Remarks	1. Cost of dewatering may be added where required upto 20 per cent of Labour cost. Assessment for dewatering shall be made as per site conditions..		
	B	Mechanical Means		
	(i)	<p>Depth upto 3 m</p> <p><i>Unit = cum (for 240 cum)</i></p> <p>a) Labour</p> <p>Skilled</p> <p>Unskilled</p> <p>b) Equipment</p> <p>Hydraulic excavator</p>	<p>day</p> <p>day</p> <p>hour</p>	<p>1.00</p> <p>3.00</p> <p>6.00</p>
	Remarks	Cost of dewatering upto 5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..		
	(ii)	<p>Depth 3 m to 6 m</p> <p><i>Unit = cum (For 210 cum)</i></p> <p>a) Labour</p> <p>Skilled</p> <p>Unskilled</p> <p>b) Equipment</p> <p>Hydraulic excavator</p>	<p>day</p> <p>day</p> <p>hour</p>	<p>1.00</p> <p>3.00</p> <p>6.00</p>
	Remarks	Cost of dewatering upto 7.5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
	(iii)	<p>Depth above 6 m <i>Unit = cum (For 180 cum)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 4.00</p> <p>b) Equipment Hydraulic excavator hour 6.00</p> <p>Remarks 1. Cost of dewatering upto 10 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions.. 2. Labour provided for excavation by mechanical means includes that required for trimming of bottom and side slopes.</p>		
	II A (i)	<p>Ordinary Rock (not requiring blasting) Manual Means Depth upto 3 m <i>Unit = cum (For 10 cum)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 10.00</p> <p>Remarks Cost of dewatering upto 10 per cent of Labour cost may be added, if required. Assessment for dewatering shall be made as per site conditions..</p>		
	B	<p>Mechanical Means <i>Unit = cum (For 90 cum)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 3.00</p> <p>b) Equipment Hydraulic excavator hour 6.00</p> <p>Remarks 1. Cost of dewatering upto 10 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.</p>		
	III A	<p>Hard Rock (requiring blasting) Manual Means <i>Unit = cum (For 10 cum)</i></p> <p>a) Labour Skilled day 1.00 Driller day 0.50 Blaster day 0.25 Unskilled day 12.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
		b) Material Gelatin Detonator electric fuse wire c) Equipment Air Compressor Jack hammer /Rock drill	kg nos m hour hour	3.50 14.00 20.00 1.00 3.00
	Remarks	Cost of dewatering @ 10 per cent of (a+b) may be added, where required Assessment for dewatering shall be made as per site conditions.		
IV		Hard Rock (blasting prohibited)		
		<i>Unit = cum (For 10 cum)</i>		
A		Mechanical Means		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	10.00
		b) Equipment		
		Air Compressor	hour	3.00
		Jack hammer /Rock drill	hour	3.00
	Remarks	1. Cost of dewatering upto 10 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions. 2. In case of rock, foundation beyond 3 m is not dug and hence not included.		
V		Marshy Soil		
		<i>Unit = cum (For 10 cum)</i>		
		Depth upto 3 m		
A		Manual means		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	15.00
		b) Equipment		
		Tractor-trolley for removal.	hour	6.00
	Remarks	1. Cost of dewatering @ 30 per cent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions. 2. Shoring & strutting 15 per cent of (a), where required may be added		
B		Mechanical Means		
		a) Labour		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
			Skilled	day	0.08
			Unskilled	day	4.00
			b) Equipment		
			Hydraulic excavator	hour	0.30
			Tipper	hour	1.00
	Remarks		1. Cost of dewatering @ 20 per cent of (a+b) may be added, where required 2. Shoring & strutting @ 10 per cent of (a+b), where required may be added		
	VI		Back Filling in Marshy Foundation Pits <i>Unit : Cum (For 18 cum)</i>		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	12.00
			b) Equipment		
			Tractor-trolley for transportation	hour	6.00
9.5		905	Stripping and Storing Top Soil Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment Material is not conducive to plant growth as per Drawing and Technical Specifications. <i>Unit = cum (For 300 cum)</i>		
			a) Labour		
			Skilled	day	2.00
			Unskilled	day	10.00
			b) Equipment		
			Dozer	hour	6.00
9.6		909	Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields. Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels to the satisfaction of the farmer as per Drawing and Technical Specifications. <i>Unit = cum (For 150 cum)</i>		
			a) Labour		
			Skilled	day	2.00
			Unskilled	day	15.00
			b) Equipment		
			Dozer	hour	6.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
9.7	909, 910	<p>Preparation and Surface Treatment of Formation.</p> <p>Preparation and surface treatment of Formation by removing mud and slurry, watering to the extent needed to maintain desired moisture content , compacting all complete as per Drawing and Technical Specifications. <i>Unit = sqm (For 3500 sqm)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 10.00</p> <p>b) Equipment Roller hour 6.00</p> <p>c) Material Cost of water KL 18.00</p>		
9.8	909, 910	<p>Construction of Embankment with Material obtained from Borrow pits Providing, laying, spreading and compacting embankment with borrow material as per Drawing and Technical Specifications. <i>Unit = cum (For 300 cum)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 4.00</p> <p>b) Material Cost of water KL 72.00 Borrowpit material cum 360.00</p> <p>c) Equipment Hydraulic Excavator hour 6.00 Tractor with rotavator hour 12.00 Dozer hour 3.00 Motor grader hour 3.00 Vibratory roller hour 6.00</p>		
	Remarks	<p>Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required.</p>		
9.9	909,910	Construction of Embankment with Material Deposited from Roadway Cutting		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity	
9.10	A		Providing, laying, spreading and compacting embankment with roadway cutting material and compact to the required density as per Drawing and Technical Specifications.(Manually) <i>Unit = cum (For 100 cum)</i>			
			a) Labour			
			Skilled	day	2.00	
			Unskilled	day	50.00	
			b) Material			
	Cost of water	KL	24.00			
	c) Equipment					
	Vibratory roller	hour	6.00			
	B			Providing, laying, spreading and compacting embankment with roadway cutting material and compact to the required density as per Drawing and Technical Specifications. (With machine) <i>Unit = cum (For 300 cum)</i>		
				a) Labour		
Skilled				day	1.00	
Unskilled				day	10.00	
b) Material						
Cost of water	KL	72.00				
c) Equipment						
Dozer	hour	6.00				
Motor grader	hour	6.00				
			Vibratory roller	hour	6.00	
	Remarks		In case the earth cutting is done by dozer and pushed for filling in the embankment, the input of dozer in the cost of embankment shall be deleted as the same is already provided in the cost of excavation. However, if the earth is dumped by tippers from roadway cutting, the input of dozer for spreading is required to be provided.			
			Construction of Rock fill Embankment Providing and laying of rock fill embankment with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular Material, rolled to required density all complete as per Drawing and Technical Specifications. <i>Unit = cum (For 150 cum)</i>			
			a) Labour			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity		
9.11	A	908	Skilled	day	1.00		
			Unskilled	day	10.00		
			b) Material				
			Cost of water	KL	12.00		
			c) Equipment				
			Dozer	hour	6.00		
			Vibratory road roller	hour	6.00		
			Remarks	It is assumed that rock is available locally at site from roadway cutting. In case, portion of the rock requires breaking to acceptable size of 300 mm, breaking charges shall be added. If not available include transported rock fill material			
			Providing suitable material and Back filling behind abutment, wing wall and return wall complete as per Drawing and Technical Specifications.				
			<i>Unit = cum (for 10 cum)</i>				
			Granular Material				
			a) Labour				
			Skilled	day	0.20		
			Unskilled	day	5.00		
b) Material							
Granular Material	cum	11.00					
Cost of water	KL	1.00					
c) Equipment							
Plate compactor/power rammer	hour	2.50					
B							
Sandy Material							
a) Labour							
Skilled	day	0.20					
Unskilled	day	5.00					
b) Material							
Sand	cum	12.00					
Cost of water	KL	1.00					
c) Equipment							
Plate compactor/power rammer	hour	2.50					
C							
Locally available Material including compaction by tamping rod (without watering)							
a) Labour							
Skilled	day	0.20					
Unskilled	day	5.00					
b) Material							
compensation for Locally available Material	cum	12.00					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
			Cost of water c) Equipment Tamping 3 % of Labour cost	KL	1.00
	D		Locally available Material, with out watering and compaction by tamping rod a) Labour Skilled Unskilled b) Material Locally available Material c) Equipment Tamping 3 % of Labour cost	day day cum	0.20 4.00 12.00
		Remarks	Cost of earthwork excavation shall be added only in case of the material obtained from excavation is not sufficient for backfilling.		
9.12		909, 910	Providing and laying of Filter media with granular Material/stone crushed aggregates 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. <i>Unit = cum (For 10 cum.)</i> a) Labour Skilled Unskilled b) Material Filter media Cost of water	day day cum KL	1.00 10.00 12.00 1.00
9.13		908	Providing and filling sand in Foundation Trenches as per Drawing & Technical Specification <i>Unit = cum (For 1 cum)</i> a) Labour Skilled Unskilled b) Material Sand	day day cum	0.01 0.30 1.20

NORMS FOR RATE ANALYSIS

SECTION 1000 - SUBGRADE

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
10.1	A	1003	<p>Scarifying Existing road Surface to a Depth of 50 mm by Manual Means Scarifying the existing road surface to a depth of 50 mm and disposal of scarified Material with all lifts and leads as per Drawing and Technical Specifications. <i>Unit = sqm (For 600 sqm)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 15.00</p> <p>b) Equipment Tractor-trolley / Truck hour 6.00</p>		
	B		<p>Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified Material with all lifts and leads within Right of way as per Drawing and Technical Specifications. <i>Unit = sqm (For 600 sqm, Lead upto 30 m)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 12.00</p>		
	Remarks		In case Material is not to be reused at site, transportation cost catered above for disposal may be added.		
10.2		1003	<p>Scarifying Existing road Surface to a depth of 50 mm by Mechanical Means</p>		
10.2	A		<p>Scarifying the existing road surface to a depth of 50 mm and disposal of scarified Material with in all lifts and lead as per Drawing and Technical Specifications. <i>Unit = sqm (For 600 sqm, lead upto 30 m)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 6.00</p> <p>b) Equipment Tractor with ripper hour 6.00</p>		
	B		<p>Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified Material with in all lifts and lead as per Drawing and Technical Specifications. <i>Unit = sqm (For 3000 sqm)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 6.00</p> <p>b) Equipment Tractor with ripper hour 6.00 Loader hour 6.00 Tipper hour 6.00</p>		
	Remarks		In case Material is not to be reused at site, transportation cost catered above for disposal may be added.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
10.3		1004	<p>Construction of Subgrade and Earthen Shoulders with approved Material (capping layer) Providing and laying sub-grade and earthen shoulders with approved Material obtained from borrow pits with all lifts & leads as per Drawing and Technical Specifications. <i>Unit = cum (For 600 cum)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Cost of water capping layer material</p> <p>c) Equipment Motor grader Vibratory roller</p>	day day KL cum hour hour	1.00 6.00 72.00 750.00 6.00 6.00
10.4	Case-I	1003, 1005	<p>Compacting Original Ground Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. <i>Unit = cum (For 600 cum)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Cost of water</p> <p>c) Equipment Tractor with ripper attachment Motor grader Vibratory roller</p>	day day KL hour hour hour	1.00 5.00 24.00 12.00 6.00 12.00
	Case-II		<p>Compacting original ground supporting embankment Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve dry density as per Drawing and Technical Specifications. <i>Unit = cum (For 600 cum)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Cost of water</p> <p>c) Equipment Tractor with ripper attachment Vibratory road roller</p>	day day KL hour hour	1.00 4.00 24.00 6.00 12.00
10.5		1006	<p>Lime Stabilization for Improving Sub-grade</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity	
10.6	A		Providing , laying and spreading available soil with 3 per cent slaked lime having minimum content of 70 per cent of CaO, mixing, grading and compacting at OMC to the desired density to form a layer of sub grade as per Drawing and Technical Specifications. <i>Unit = cum [For 300 cum (525 tone)]</i>			
			By Mechanical Means			
			a) Labour			
			Skilled	day	2.00	
			Unskilled	day	12.00	
			b) Material			
			Lime	tonne	15.75	
			Cost of water	KL	72.00	
			c) Equipment			
			Tractor with ripper and rotator	hour	12.00	
	Motor Grader	hour	6.00			
	Vibratory roller	hour	6.00			
	B			By Manual Means <i>Unit = cum (For 150 cum (263 tones))</i>		
				a) Labour		
				Skilled	day	3.00
				Unskilled	day	50.00
				b) Material		
				Lime	tonne	8.00
				Cost of water	KL	36.00
				c) Equipment		
Vibratory roller				hour	6.00	
			Cement Stabilization / Ecological Road pavement			
			Providing , laying and spreading available soil with 5 % cement and 25 % sand on soil (thicknes 25 cm) mixing, grading and compacting at OMC (roughly 0.33 lit of water per kag of cement) to the desired density to form a layer of sub grade/ dust free(Ecological) Road pavement as per Drawing and Technical Specifications. <i>Unit = cum [For 500 sqm]</i>			
			a) Labour			
			Engineer	day	1.00	
			Skilled	day	2.00	
			Unskilled	day	30.00	
			b) Material			
			Cement	tonne	12.00	
			sand	cum	32.00	
			Cost of water	KL	12.00	
			c) Equipment			
			Tractor with ripper and rotator	hour	6.00	

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
		Motor Grader	hour	6.00
		Vibratory roller	hour	6.00
		Smooth wheel Roller	hour	6.00
10.7	Remarks	For stabilizing road surface for other than 25 cm thickness, calculate rate based on volume, assuming above requirement is for 125 cum.		
		Polymer based Stabilization		
		Providing , laying and spreading Polymer based stabilizer, mixing, grading and compacting to form a layer of sub grade as per Drawing and Technical Specifications.		
		<i>Unit = cum [For 200 cum]</i>		
		a) Labour		
		Engineer	day	1.00
		Skilled	day	2.00
		Unskilled	day	10.00
		b) Material		
		Polymer based Admixture	Lit	32.00
Cost of water	KL	20.00		
c) Equipment				
Tractor with ripper and rotator	hour	6.00		
Motor Grader	hour	6.00		
Smooth wheel Roller	hour	6.00		
10.8		Providing and laying of hand pack Stone soling with 150 to 200 mm thick stones and packing with smaller stone on prepared surface as per Drawing and Technical Specifications.		
		<i>Unit = cum [For 5 cum]</i>		
		a) Labour		
		Skilled	day	6.00
		Unskilled	day	12.00
b) Material				
Stone	cum	6.00		
10.9		Providing and laying of hand pack Cobble Stone (approx size 10 cm * 9 cm * 9cm)with granular material bedding on prepared surface as per Drawing and Technical Specifications.		
		<i>Unit = sqm [For 5 sqm]</i>		
		a) Labour		
		Skilled	day	0.10
		Unskilled	day	2.00
b) Material				
Stone	cum	0.60		

SECTION - 1100 OVERALL REQUIREMENT

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			<p>No separate payment Cost included in related Activities</p>		

SECTION 1200 - SUB BASE, BASE, HARD SHOULDER AND

S No		Ref. to SS.	Description of Activity / Resource	Unit	Quantity
12.1	A	1201	<p>Providing and laying Granular Sub-Base Material By Mechanical means</p> <p>Providing and laying granular sub-base on prepared surface, mixing at OMC, and compacting to achieve the desired density, complete as per Drawing and Technical Specifications.</p> <p><i>Unit = cum (For 300 cum)</i></p> <p>a) Labour</p> <p>Skilled day 2.00</p> <p>Unskilled day 12.00</p> <p>b) Material</p> <p>Sub-base Material S1 type or S2 type cum 384.00</p> <p>Cost of water KL 18.00</p> <p>c) Equipment</p> <p>Motor Grader hour 6.00</p> <p>Vibratory roller hour 12.00</p> <p>Tractor /Loader hour 12.00</p>		
	Remarks		Select any one of the type of sub base Material as per design		
12.1	B	1201	<p>By manual Means</p> <p>Providing and laying granular sub-base on prepared surface, mixing at OMC, and compacting to achieve the desired density, complete as per Drawing and Technical Specifications.</p> <p><i>Unit = cum (For 200 cum)</i></p> <p>a) Labour</p> <p>Skilled day 2.00</p> <p>Unskilled day 60.00</p> <p>b) Material</p> <p>Sub-base Material S1 type or S2 type cum 256.00</p> <p>Cost of water KL 23.00</p> <p>c) Equipment</p> <p>Vibratory roller hour 6.00</p>		
	Remarks		Select any one of the type of sub base Material as per design		
12.2		1202	<p>Cement Treated Soil Sub Base/ Base</p> <p>Providing, laying and spreading soil on a prepared sub grade, pulverizing, adding the designed quantity of cement to the spread soil, mixing in place, grading and compacting at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base as per Drawing and Technical Specifications.</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of Activity / Resource	Unit	Quantity
12.3	1202	<p><i>Unit = cum [For 300 cum (525 tones)</i></p> <p>For 4 per cent quantity of cement by weight of soil</p> <p>a) Labour Skilled day 3.00 Unskilled day 15.00</p> <p>b) Material soil/ borrowpit material cum 384.00 Cement tonne 21.00 Cost of water KL 72.00</p> <p>c) Equipment Excavator hour 6.00 Motor Grader hour 6.00 Vibratory roller hour 6.00 Tractor with rotavator hour 12.00</p> <p>Cost for compensation of earth may be added, if necessary</p>		
		<p>Cement Treated Crushed Rock having grading requirement as per specification for Sub base/ Base</p> <p>Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place , grading and compacting at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base as per Drawing and Technical Specifications.</p> <p><i>Unit = cum [For 300 cum (600 tones)</i></p>		
12.4	907	<p>a) Labour Skilled day 3.00 Unskilled day 15.00</p> <p>b) Equipment Motor Grader hour 6.00 Vibratory roller hour 6.00 Tractor / Loader hour 12.00</p> <p>c) Material Cement tonne 24.00 Material for sub-base course/ base course as per grading requirement cum 384.00 Cost of water KL 72.00</p>		
		<p>Remarks</p> <p>1. Quantities of aggregates provided under 'c' above are uncompacted quantities. 2. Quantity of cement assumed as 4 per cent of quantity of crushed rock by weight.</p> <p>Making 50 mm x 50 mm Furrows Making 50 mm x 50 mm furrows, 50 mm deep, 450 to the center line of the road and at one meter interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated Material .</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of Activity / Resource	Unit	Quantity
12.5	(i)	1203	<i>Unit = sqm (For 30 m x 7 m x 3 = 630 sqm)</i> 25 mm deep furrow cutting		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	8.00
			b) Equipment		
			Tractor-trolley	hour	6.00
			Inverted Choke		
			Providing, laying, spreading and compacting screening / coarse sand of specified grade in uniform layer on a prepared surface and compacting to form a inverted Choke as per Drawing and Technical Specifications.		
			<i>Unit = cum (For 600 cum)</i>		
			a) Labour		
Skilled	day	3.00			
Unskilled	day	21.00			
b) Material					
Screening / coarse sand	cum	720.00			
Cost of water	KL	108.00			
c) Equipment					
Motor Grader	hour	6.00			
Vibratory roller	hour	6.00			
12.6	A	1203	Water Bound Macadam		
			Providing, laying, spreading and compacting Water bound macadam including brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density as per Drawing and Technical Specifications.		
			By Manual Means		
			<i>Unit = cum (For 360 cum)</i>		
			a) Labour		
			Skilled	day	10.00
			Unskilled	day	375.00
			b) Material		
			Aggregate (Grading as per specification)	cum	435.60
			Stone Screening		
13.2 mm	cum	57.60			
OR					
11.2 mm for grading-II	cum	86.40			
Cost of water	KL	144.00			
c) Equipment					
Vibratory roller	hour	12.00			
OR					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of Activity / Resource	Unit	Quantity
12.7	B		Smooth 3 wheeled steel roller	hour	12.00
	Remarks		<p>By Mechanical Means: <i>Unit = cum (For 360 cum)</i></p> <p>a) Labour Skilled day 3.00 Unskilled day 15.00</p> <p>b) Material Aggregate (Grading as per specification)</p> <p>Stone Screening 13.2 mm for grading-I cum 57.60</p> <p>OR 11.2 mm for grading-II cum 86.40 Cost of water KL 144.00</p> <p>c) Equipment Motor grader hour 6.00 Vibratory roller hour 6.00 or Smooth 3 wheeled steel roller hour 12.00</p> <p>1. Select material as per grading . 2. As three wheeled smooth rollers are also very commonly used, the same has been provided as an alternative.</p>		
	A	1204	<p>Crusher Run Macadam Base and sub-base Providing and laying Crusher Run Macadam on a prepared surface, spreading and mixing , watering and compacting to form a layer of sub-base/Base course as per Drawing and Technical Specifications. <i>Unit = cum (For 360 cum)</i></p> <p>By Mix in Place Method</p> <p>a) Labour Skilled day 3.00 Unskilled day 14.00</p> <p>c) Material Aggregate at site</p> <p>i) For 53 mm maximum size 63 mm to 45 mm cum 157.46 22.5 mm to 5.6 mm cum 151.06 Below 5.6 mm cum 166.68 Cost of water KL 36.00</p> <p>Or ii) For 45 mm maximum size 45 mm to 22.5 mm cum 24.12</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of Activity / Resource	Unit	Quantity
			22.4 mm to 5.6 mm	cum	237.60
			Below 5.6 mm	cum	213.48
			Cost of water	KL	36.00
			b) Equipment		
			Motor grader	hour	6.00
			Vibratory roller	hour	6.00
	Remarks		Any one size / grading of the aggregate grading shall select.		
12.8		1205	Construction of Median and Island with Soil Taken from Roadway Cutting Providing and laying Median and Island above road level with approved Material deposited including compacted as per Drawing and Specifications. (using material from Roadway excavation). Unit = cum (For 21 cum)		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	9.00
			b) Material		
			Cost of water	KL	6.00
			c) Equipment		
			Plate compactor	hour	9.00
12.9		1205	Construction of Median and Island with Soil Taken from Borrow Areas Providing and laying Median and Island above road level with approved Material deposited including compacted as per Drawing and Specifications. (using material from borrow area). Unit = cum (For 21 cum)		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	6.00
			b) Material		
			Soil/ borrowpit material	cum	27.00
			Cost of water	KL	6.00
			c) Equipment		
			Plate Compactor	hour	9.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of Activity / Resource	Unit	Quantity
	Remarks	Analysis of 12.8 and 12.9 are for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on bio- engineering. In case surface finish is of hard type, the same may be provided separately as per approved design.		
12.10	1205	<p>Construction of Shoulders</p> <p>A. Earthen Shoulders The rate as applicable for sub-grade construction may be adopted.</p> <p>B. Hard Shoulders Rate as applicable for sub-base and or base may be adopted as per approved design.</p> <p>C. Paved shoulders The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.</p>		
12.11	1205	<p>Footpaths and Separators</p> <p>Providing and making footpath/separator of 150 mm compacted granular sub base and 25 mm thick cement concrete grade M 15, over laid with pre-cast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding Kerb channel as per Drawing and Technical Specifications. <i>Unit = sqm (For 300 sqm)</i></p> <p>a) Labour</p> <p>Skilled day 8.00 Unskilled day 45.00</p> <p>b) Material</p> <p>i) For Granular sub base Material</p> <p>53 mm to 26.5 mm cum 20.79 26.5 mm to 4.75 mm cum 26.73 2.36 mm below cum 11.88</p> <p>ii) For cement concrete grade M 15, (7.5 cum)</p> <p>Aggregate 12 mm cum 6.75 Sand cum 3.38 Cement tonne 1.88</p> <p>iii) For cement plaster 1:3</p> <p>Sand cum 3.84 Cement tonne 1.83</p> <p>iv) Pre-cast cement concrete tiles Tiles size 300 x 300 mm and 25 mm thick nos 3300.00</p> <p>v) pipes for drainage PVC Pipes 200 mm dia meter 22.50</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of Activity / Resource	Unit	Quantity
12.12		1206	vi) Cost of water	KL	12.00
			c) Equipment		
			Vibratory road roller	hour	1.25
			Concrete mixer	hour	9.00
			Telford base (block pitching)		
			Providing laying, spreading watering, levelling and compaction of Telford base (Block pitching) as per Drawing and Technical Specifications.		
			<i>Unit = cum (For 50 cum)</i>		
			a) Labour		
			Skill	day	60.00
			Unskilled	day	120.00
12.13	A	1207	b) Material		
			Block stone	cum	55.00
			dust	cum	16.00
			Cost of water	KL	12.00
			c) Equipment		
			Vibratory road roller	hour	6.00
			Dry Bound Macadam		
			Providing, laying, spreading and compacting stone aggregates of specific sizes to dry bound macadam including spreading in uniform thickness, hand packing, rolling and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, and compacting to the required density as per Drawing and Technical Specifications.		
			By Manual Means		
			<i>Unit = cum (For 180 cum)</i>		
(i)			a) Labour		
			Skilled	day	3.00
			Unskilled	day	180.00
			b) Material		
			Grading-I Aggregate		
			Grading-I 63 mm to 45 mm /Grading-II 53 mm to 22.4 mm	cum	217.80
			Stone Screening		
			Crushable type such as Moorum or Gravel for grading I & II	cum	105.59
			Binding Material		
			Binding Material	cum	14.40
Cost of water	KL	72.00			
(ii)			Grading-II Aggregate		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of Activity / Resource	Unit	Quantity
12.14	1208	Grading-II 53 mm to 22.4 mm	cum	217.80
		Stone Screening		
		Crushable type such as Moorum or Gravel for grading I & II	cum	52.80
		Binding Material		
		Binding Material	cum	14.40
		Cost of water	KL	72.00
		c) Equipment		
		Vibratory roller or	hour	6.00
		Smooth 3 wheeled steel roller	hour	12.00
		Wet Mix Macadam		
		Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC laying in uniform layers in sub-base / base course on well prepared surface and compacting to achieve required density as per Drawing and Technical Specifications.		
		Base course with B1 material		
		<i>Unit = cum [For 225 cum (495 tones)]</i>		
		a) Labour		
		Skilled	day	3.00
		Unskilled	day	10.00
		b) Material		
		45 mm to 22.4 mm	cum	89.10
		22.4 mm to 2.36 mm	cum	118.80
		2.36 mm to 75 micron	cum	89.10
		Cost of water	KL	18.00
c) Equipment				
Wet mix plant / other similar equipment	hour	9.00		
Electric generator	hour	6.00		
Paver finisher	hour	6.00		
Vibratory roller or	hour	6.00		
Smooth 3 wheeled steel roller	hour	12.00		
B				
Base course with B2 material				
<i>Unit = cum [For 225 cum (495 tones)]</i>				
a) Labour				
Skilled	day	3.00		
Unskilled	day	10.00		
b) Material				
45 mm to 22.4 mm	cum	89.10		
22.4 mm to 2.36 mm	cum	118.80		
2.36 mm to 75 micron	cum	89.10		
Cost of water	KL	18.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of Activity / Resource	Unit	Quantity
		c) Equipment Wet mix plant / other similar equipment Electric generator Paver finisher Vibratory roller or Smooth 3 wheeled steel roller	hour hour hour hour hour	9.00 6.00 6.00 6.00 12.00
	C	Sub Base course with S1 material <i>Unit = cum [For 225 cum (495 tones)]</i>		
		a) Labour Skilled Unskilled	day day	3.00 15.00
		b) Material 45 mm to 22.4 mm 22.4 mm to 2.36 mm 2.36 mm to 75 micron Cost of water	cum cum cum KL	89.10 118.80 89.10 18.00
		c) Equipment Wet mix plant / other similar equipment Electric generator Paver finisher Vibratory roller or Smooth 3 wheeled steel roller	hour hour hour hour hour	9.00 6.00 6.00 6.00 12.00
	D	Sub Base course with S2 material <i>Unit = cum [For 225 cum (495 tones)]</i>		
		a) Labour Skilled Unskilled	day day	3.00 15.00
		b) Material 45 mm to 22.4 mm 22.4 mm to 2.36 mm 2.36 mm to 75 micron Cost of water	cum cum cum KL	89.10 118.80 89.10 18.00
		c) Equipment Wet mix plant / other similar equipment Electric generator Paver finisher Vibratory roller or Smooth 3 wheeled steel roller	hour hour hour hour hour	9.00 6.00 6.00 6.00 12.00
	Remarks	<p>1. Though vibratory roller is required only for 3 hour but it should be at site for 6 hours</p> <p>2. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative which can be used if the thickness of individual layer does not exceed 100 mm..</p>		

SECTION - 1300 BITUMINOUS SURFACE AND BASE COURSE

S No		Ref. to SS	Description	Unit	Quantity
13.1	A	1302 1302	<p>Prime Coat Prime Coat, with MC 30 / 70 by Mechanical Means Providing and applying prime coat with Hot Bitumen (including cutter) on prepared surface of granular base including cleaning of road surface and spraying by mechanical means as per Technical Specification . <i>Unit = lit (For 5000 lit)</i></p> <p>a) Labour Skilled day 3.00 Unskilled day 50.00</p> <p>b) Material Bitumen (cutback) MC 30 (for WBM) tonne 5.25 or Bitumen (cut back)MC 70 (for stabilized soil base/ crusher run macadam) Cost of water KL 10.00</p> <p>c) Equipment Mechanical broom hour 8.00 Air compressor hour 8.00 Bitumen distributor hour 6.00 Boiler hour 8.00 Generator hour 8.00</p>		
		Remarks	<p>1. Bitumen may be cut back bitumen, Paving Bitumen, Polymer modified bitumen, Crumb Rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen</p>		
	B		<p>Prime Coat, with MC 30 / 70 by Bitumen , by manual means Providing and applying prime coat with Hot Bitumen(including cutter) on prepared surface of granular base including cleaning of road surface and spraying at specified rate by manual means as per Technical Specification . <i>Unit = lit (For 1000 lit)</i></p> <p>a) Labour Skilled day 3.00 Unskilled day 100.00</p> <p>b) Material Bitumen (cutback) MC 30 (for WBM) tonne 1.10 or Bitumen (cut back)MC 70 (for stabilized soil base/ crusher run macadam) tonne 1.10 Cost of water KL 10.00</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			<p>c) Equipment Tractor Bitumen sprayer Boiler Generator</p>	hour hour hour hour	6.00 6.00 8.00 8.00
	Remarks		1. Bitumen may be Paving Bitumen, Polymer modified bitumen, Crumb Rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen		
	C	1302	<p>Prime Coat, with Emulsion by Mechanical Means</p> <p>Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at specified rate using mechanical means as per Technical Specification . <i>Unit = lit (For 5000 lit)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Bitumen emulsion Cost of water</p> <p>c) Equipment Mechanical broom Air compressor Emulsion distributor</p>	day day tonne KL hour hour hour	3.00 40.00 5.25 10.00 8.00 8.00 6.00
	D		<p>Prime Coat with emulsion, for manual works Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at specified rate as per Technical Specification. <i>Unit = lit (For 1000 lit)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Bitumen emulsion Cost of water</p> <p>c) Equipment Tractor trolley Emulsion sprayer</p>	day day tonne KL hour hour	3.00 80.00 1.10 10.00 6.00 6.00
13.2	A	1302	<p>Tack Coat</p> <p>Tack coat with Bitumen By Mechanical Means Providing and applying tack coat with hot Bitumen at specified rate on the prepared non-bituminous surfaces including cleaning as per Technical Speciation . <i>Unit = lit. (For 5000 lit)</i></p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			<p>a) Labour Skilled Unskilled</p> <p>b) Material Bitumen (paving grade)</p> <p>c) Equipment Air compressor Bitumen distributor Boiler Generator</p>	<p>day day tonne hour hour hour hour</p>	<p>3.00 20.00 5.25 6.00 6.00 6.00 6.00</p>
	B		<p>Tack coat with Bitumen by Manual Means Providing and applying tack coat with hot Bitumen at the specified rate the prepared surfaces including cleaning as per Technical Speciation .</p> <p><i>Unit = lit. (For 1000 lit)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Bitumen (paving grade)</p> <p>c) Equipment Tractor Bitumen sprayer Boiler Generator</p>	<p>day day tonne hour hour hour hour</p>	<p>3.00 40.00 1.10 6.00 6.00 8.00 8.00</p>
	Remarks		<p>1. Bitumen may be Paving Bitumen, Polymer modified bitumen, Crumb Rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen</p>		
	C	1302	<p>Tack coat with Emulsion By Mechanical Means Providing and applying tack coat with Bitumen emulsion at specified rate on the prepared non-bituminous surfaces including cleaning as per Technical Speciation .</p> <p><i>Unit = lit (For 5000 lit)</i></p> <p>a) Labour Foreman Unskilled</p> <p>b) Material Bitumen emulsion</p> <p>c) Equipment</p>	<p>day day tonne</p>	<p>2.00 20.00 5.25</p>

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity		
13.3	D	1307	Air compressor	hour	6.00		
			Emulsion pressure distributor	hour	6.00		
			Generator	hour	6.00		
			Tack coat with Emulsion By Manual Means				
			Providing and applying tack coat with Bitumen emulsion at the specified rate the prepared surfaces including cleaning as per Technical Speciation .				
			<i>Unit = lit (For 1000 lit)</i>				
			a) Labour				
			Skilled			day	2.00
			Unskilled			day	20.00
			b) Material				
			Bitumen emulsion			tonne	1.10
			Cost of water			KL	1.00
			c) Equipment				
			Boiler			hour	6.00
			Hand sprayer			hour	6.00
			Bituminous Macadam				
			Providing and laying bituminous macadam with hot mix plant using crushed aggregates of grading as per specification premixed with bituminous binder, laid over a previously prepared surface as per Drawing and Technical Specifications.				
			<i>Unit = cum [For 102.5 cum (225 tonne)]</i>				
			a) Labour				
			Skilled			day	7.00
			Unskilled			day	14.00
			b) Material				
			i) Bitumen			tonne	7.43
*Grading I (40 mm nominal size)							
37.5 - 25 mm 15 per cent			cum	21.76			
25 - 10 mm 45 per cent			cum	65.28			
10 - 5 mm 25 per cent			cum	36.27			
5 mm and below 15 per cent			cum	21.76			
or							
Grading II(19 mm nominal size)							
25 - 10 mm 40 per cent			cum	58.02			
10 - 5 mm 40 per cent			cum	58.02			
5 mm and below 20 per cent			cum	29,01			
* Any one of the alternative may be adopted as per approved design							
c) Equipment							
Batch mix HEMP			hour	6.00			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			Air compressor	hour	6.00
			Paver finisher	hour	6.00
			Generator	hour	6.00
			Pneumatic Roller	hour	6.00
	Remarks		<p>1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb Rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen</p> <p>2. Labour for traffic control, watch and ward and other miscellaneous duties at site including have been covered in overheads of the contractor.</p> <p>3. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 Nos Unskilled for the same shall be reduced as the same has been included in the cost of tack coat.</p>		
13.4		1304	<p>Bituminous Penetration Macadam Providing and laying penetration macadam over prepared Base by providing a layer of compacted crushed coarse aggregate with applications of bituminous binder and key aggregates as per Drawing and Technical Specifications.</p>		
	A		<p>50 mm thick <i>Unit = sqm [For 4500 sqm (225 cum)]</i></p> <p>a) Labour</p> <p>Unskilled day 9.00</p> <p>Skilled day 3.00</p> <p>b) Material</p> <p>Bitumen tonne 15.30</p> <p>Coarse aggregate (45 - 2.8 mm) cum 270.00</p> <p>Key aggregates (22.4 - 2.8 mm) cum 67.50</p> <p>c) Equipment</p> <p>Chips Spreader (with truck) hour 6.00</p> <p>Bitumen Distributor hour 6.00</p> <p>Vibratory roller hour 6.00</p>		
	B		<p>75 mm thick <i>Unit = sqm [For 4500 sqm (337.5 cum compacted)]</i></p> <p>a) Labour</p> <p>Unskilled day 12.00</p> <p>Skilled day 3.00</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
13.5	1308	b) Material		
		Bitumen	tonne	22.70
		Coarse aggregate (63- 2.8 mm)	cum	405.00
		Key aggregates (26.5 - 2.8 mm)	cum	81.00
		c) Equipment		
		Chips Spreader (with truck)	hour	6.00
		Bitumen distributor	hour	6.00
		Vibratory roller	hour	12.00
		Dense Graded Bituminous Macadam		
		Providing and laying dense bituminous macadam using crushed aggregates of specified grading, premixed with bituminous binder and filler as per Drawing and Technical Specifications.		
		<i>Unit = cum [For 97.5 cum (225 tonne)]</i>		
		a) Labour		
		Unskilled	day	16.00
		Skilled	day	5.00
		b) Material		
		Bitumen	tonne	9.56
		Aggregate		
		Grading - I 40 mm (Nominal Size)		
		37.5 - 25 mm	cum	31.60
		25 - 10 mm	cum	18.67
		10 -4.75 mm	cum	27.29
4.75 mm and below	cum	63.20		
Filler	tonne	4.31		
or				
Grading - II 19 mm (Nominal Size)				
25 - 10 mm	cum	43.08		
10 - 5 mm	cum	40.22		
5 mm and below	cum	57.45		
Filler	tonne	4.31		
* Any one of the alternative may be adopted as per approved design				
c) Equipment				
Batch mix HMP	hour	6.00		
Paver finisher	hour	6.00		
Generator	hour	6.00		
Pneumatic Roller	hour	6.00		
Vibratory roller	hour	6.00		
smooth wheeled tandem roller.	hour	6.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
13.6	1309	<p>1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb Rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen</p> <p>2. Labour for traffic control, watch and ward and other miscellaneous duties at site have been covered in overheads of the contractor.</p> <p>3. In case DBM is laid over freshly laid tack coat, provision of mechanical broom and 2 Nos Unskilled shall be reduced as the same has been included in the cost of tack coat.</p> <p>4. The individual density for each size of aggregates to be used for construction I.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be amended for use in field.</p>		
		Bituminous Concrete / Asphalt Concrete		
		Providing and laying Bituminous concrete/ Asphalt concrete using crushed aggregates of specified grading, premixed with bituminous binder and filler as per Drawing and Technical Specifications		
		<i>Unit = cum [For 95.5 cum (225 tonne)]</i>		
		a) Labour		
		Unskilled	day	15.00
		Skilled	day	5.00
		b) Material		
		i) Bitumen	tonne	12.94
		ii) Aggregate		
		* Grading - I-19 mm (Nominal Size)		
		20 - 10 mm	cum	49.48
		10 - 5 mm	cum	32.52
5 mm and below	cum	56.55		
Filler	tonne	2.83		
or				
Grading - II-13 mm (Nominal Size)				
13.2 - 10 mm	cum	42.41		
10 - 5 mm	cum	35.34		
5 mm and below	cum	60.79		
Filler	tonne	2.83		
*Any one of the alternative may be adopted as per approved design				
c) Equipment				
Batch mix HMP	hour	6.00		
Paver finisher	hour	6.00		
Generator	hour	6.00		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
		Smooth wheeled roller	hour	12.00
		Pneumatic Roller	hour	6.00
13.7	1303	Remarks		
		<p>1. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb Rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen</p> <p>2. Labour for traffic control, watch and ward and other miscellaneous duties at site have been covered in overheads of the contractor.</p> <p>3. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 Unskilled shall be reduced from above as the same has been included in the cost of tack coat.</p> <p>4. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be amended for use in field. The average density of 1.5 tonne/cum is only a reference density in this analysis.</p> <p>5. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e. excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.</p>		
	A	Surface Dressing Providing and laying surface dressing as wearing course in single coat using gravel of specified size on a recently applied layer of bituminous binder on prepared surface as per Drawing and Technical Specifications. MECHANICAL MEANS <i>Unit = sqm (For 6000 sqm)</i>		
	Case - I	:-19 mm nominal chipping size a) Labour Unskilled Skilled b) Material Chips, 19 mm nominal size c) Equipment Chip spreader Roller (pneumatic)	 day day cum hour hour	 12.00 3.00 102.00 6.00 12.00
	Case - II	13 mm nominal size chipping <i>Unit = sqm (For 7500 sqm)</i> a) Labour		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			Unskilled	day	12.00
			Skilled	day	3.00
			b) Material		
			Crushed stone chipping, 13 mm nominal size	cum	87.00
			c) Equipment		
			Chip spreader	hour	6.00
			Roller (pneumatic)	hour	12.00
		Case - III	10 mm nominal size chipping <i>Unit = sqm (For 9000 sqm)</i>		
			a) Labour		
			Unskilled	day	12.00
			Skilled	day	3.00
			b) Material		
			Crushed stone chipping, 10 mm nominal size	cum	80.30
			c) Equipment		
			Chip spreader	hour	6.00
			Roller (pneumatic)	hour	12.00
		Case - IV	6.0 mm nominal size chipping <i>Unit = sqm (For 9000 sqm)</i>		
			a) Labour		
			Unskilled	day	12.00
			Skilled	day	3.00
			b) Material		
			Crushed stone chippings 6 mm nominal size	cum	48.20
			c) Equipment		
			chip spreader	hour	6.00
			Roller (pneumatic)	hour	12.00
		Remarks	1. prime coat and Tack coat is already covered in Item no 13.1 and 13.2. 2. Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder. Alternatively, chips may be pre-coated as per Specifications 3. Input for the second coat, where required, will be the same as per the I st coat mentioned above		
13.7	B	1303	MANUAL MEANS <i>Unit = sqm (For 600 sqm)</i> :-19 mm nominal chipping size		
			a) Labour		
			Unskilled	day	12.00
			Skilled	day	3.00
			b) Material		
			Crushed stone chipping 19 mm nominal size	cum	10.20

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity	
13.8	Case - II	c) Equipment Roller (pneumatic) Add: 0.5 percent of Labour for T&P	hour	6.00	
		13 mm nominal size chipping <i>Unit = sqm (For 900 sqm)</i>			
		a) Labour Unskilled	day	12.00	
		Skilled	day	3.00	
		b) Material Crushed stone chipping, 13 mm nominal size	cum	10.40	
		c) Equipment Roller (pneumatic) Add: 0.5 per cent of (a) Labour for T&P	hour	2.25	
	Case - III	10 mm nominal size chipping <i>Unit = sqm (For 1000 sqm)</i>			
		a) Labour Unskilled	day	12.00	
		Skilled	day	3.00	
		b) Material Crushed stone chipping, 10 mm nominal size	cum	8.90	
		c) Equipment Roller (pneumatic) Add: 0.5 per cent of Labour for T&P	hour	2.25	
		Remarks	1. prime coat and Tack coat is already covered in Item no 13.1 and 13.2. 2. Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder. Alternatively, chips may be pre-coated as per Specification 3. Input for the second coat, where required, will be the same as per the 1st coat mentioned above		
	Pre-coating Chips Pre-coating of chips with 1 per cent of paving bitumen by weight of chips in a suitable mixer duly heated to 160 degree C as per Technical Specification <i>Unit = cum (For 30 cum)</i>				
		a) Labour Skilled	day	0.50	
	Unskilled	day	24.00		
	b) Material Bitumen	tonne	0.48		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
13.9	Remarks	1311	<p>c) Equipment</p> <p>Bitumen boiler</p> <p>Mixture machine</p>	hour	6.00
			<p>hour</p> <p>6.00</p>		
			<p>Above rate is for Pre-coating only (excluding cost of Chips)</p>		
			<p>20 mm thick Open-Graded Premix Carpet using Bituminous (Paving bitumen / Modified bitumen) Binder</p> <p>Providing and laying open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates as wearing course on a previously prepared base as per drawing and Technical Specifications .</p> <p>By Manual Means</p> <p><i>Unit = sqm [For 500 sqm (10 cum)]</i></p>		
	A		<p>a) Labour</p> <p>Unskilled</p> <p>Skilled</p>	day	21.00
				day	8.00
			<p>b) Material</p> <p>Paving bitumen or other as per Design</p> <p>Crushed stone chipping, 13.2 mm to 5.6 mm</p>	tonne	0.73
				cum	13.50
			<p>c) Equipment</p> <p>Mixer</p> <p>Bitumen boiler oil fired</p> <p>Roller (Smooth wheeled)</p>	hour	4.00
				hour	4.00
				hour	2.00
	Remarks		<p>1. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen</p>		
			<p>By Mechanical Means</p> <p>Providing and laying open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates as wearing course on a previously prepared base as per drawing and Technical Specifications .</p> <p><i>Unit = sqm [For 4000 sqm (80 cum)</i></p>		
			<p>(i) Mechanical method using Hot Mix Plant</p>		
			<p>a) Labour</p> <p>Unskilled</p> <p>Skilled</p>	day	16.00
				day	5.00
			<p>b) Material</p> <p>Bitumen</p> <p>Crushed stone chipping, 13.2 mm to 5.6 mm</p>	tonne	5.84
				cum	108.00
			<p>c) Equipment</p> <p>Hot mixed plant</p>	hour	6.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			Generator	hour	6.00
			Paver	hour	6.00
			Smooth wheeled/ Tandem roller	hour	6.00
	Remarks		Bitumen may be Paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen		
	(ii)		Open-Graded Premix Surfacing using cationic Bitumen Emulsion <i>Unit = sqm [For 900 sqm (24.3 cum)]</i>		
			a) Labour		
			Unskilled	day	18.00
			Skilled	day	3.00
			b) Material		
			Cationic Bitumen Emulsion	tonne	1.94
			Crushed stone aggregates 13.2 mm to 5.6 mm	cum	24.30
			c) Equipment		
			Concrete mixer	hour	6.00
			Smooth wheeled steel roller	hour	6.00
13.10		1310	Close Graded Premix Surfacing/Mixed Seal Surfacing <i>Mechanical means using HMP of appropriate capacity ,</i> <i>Providing and laying close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm or 13.2 mm to 0.09 mm aggregates using bitumen as wearing course on a previously prepared base, including mixing in a suitable plant as per Drawing and Technical Specifications.</i> <i>Unit = sqm [For 10250 sqm (205 cum)]</i>		
			a) Labour		
			Unskilled	day	16.00
			Skilled	day	6.00
			b) Material		
			Type - A		
			* Bitumen	tonne	22.50
			Stone crushed aggregates 11.2 mm to 0.09	cum	276.75
			or		
			Type - B		
			Bitumen	tonne	19.48
			Stone crushed aggregates 13.2 mm to 0.09 mm	cum	276.75
			c) Equipment		
			i) HMP	hour	6.00
			ii) Generator	hour	6.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			iii) Loader v) Paver finisher iv) Smooth wheeled	hour hour hour	6.00 6.00 6.00
			1. Bitumen may be Paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen * Any one of the alternative may be adopted		
13.11		1310	Seal Surfacing Providing and laying seal coat sealing the voids in a bituminous surface as per Drawing and Technical Specifications. <i>Unit = sqm [For 7858 sqm (47.16 cum)]</i>		
			a) Labour Skilled Unskilled	day day	1.00 6.00
			b) Material Bitumen Crushed stone chipping	tonne cum	5.34 47.16
			c) Equipment HMP Generator Paver finisher Roller	hour hour hour hour	3.00 3.00 6.00 6.00
13.12		1310	Slurry Seal Providing and laying slurry seal consisting of a mixture of fine aggregates, Portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface as per Drawing and Technical Specifications.		
	(i)		5 mm thickness <i>Unit = sqm [For 16000 sqm (80 cum) density of 2.2 tonne per cum, weight of mix = 176 tonne]</i>		
			a) Labour Skilled Unskilled	day day	1.00 8.00
			b) Material Binder Fine aggregate 4.75 mm Filler Cost of water	tonne cum tonne KL	19.36 102.08 3.52 12.00
			c) Equipment		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity	
13.13	(ii)	Mechanical broom	hour	6.00	
		Air compressor	hour	6.00	
		Mobile slurry seal equipment	hour	6.00	
		Pneumatic tired roller	hour	6.00	
		3 mm thickness			
		<i>Unit = sqm [For 20000 sqm (60 cum)]</i>			
		a) Labour			
		Skilled	day	1.00	
		Unskilled	day	7.00	
		b) Material			
		Binder	tonne	17.16	
		Fine aggregate 3 mm and below	cum	74.80	
		Filler	tonne	2.64	
		Cost of water	KL	12.00	
	c) Equipment				
	Mechanical broom	hour	6.00		
	Air compressor	hour	6.00		
	Mobile slurry seal equipment	hour	6.00		
	(iii)	1.5 mm thickness			
		<i>Unit = sqm [For 24000 sqm (36 cum)]</i>			
		a) Labour			
		Skilled	day	1.00	
		Unskilled	day	7.00	
		b) Material			
		Binder	tonne	12.67	
		Fine aggregate 2.36 mm	cum	43.30	
Filler		tonne	1.58		
Cost of water		KL	12.00		
c) Equipment					
Mechanical broom		hour	6.00		
Air compressor	hour	6.00			
Mobile slurry seal equipment	hour	6.00			
	Remarks	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately			
	1310	Fog Spray Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing as per Drawing and Technical Specifications. <i>Unit = sqm (For 10500 sqm)</i> a) Labour			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
13.14		1313	Skilled	day	1.00
			Unskilled	day	4.00
			b) Material		
			Bitumen emulsion	tonne	7.88
			c) Equipment		
			Mechanical broom	hour	6.00
			Air compressor	hour	6.00
			Bitumen emulsion pressure distributor	tonne	6.00
			Remarks		In case it is decided by the engineer to blind the fog spray, the following may be added
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	6.00
			b) Material		
			Crushed stone grit 3 mm	cum	26.25
			Bitumen emulsion	tonne	0.79
			(i) Bituminous Cold Mix (Including Gravel Emulsion)		
			Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type as per Drawing and Technical Specifications.		
			Unit = cum [For 205 cum (450 tonne)]		
			Using bitumen emulsion and 9.5 mm or 13.2 mm size aggregate		
			a) Labour		
Unskilled	day	16.00			
Skilled	day	6.00			
b) Material					
Bitumen emulsion	tonne	36.00			
Filler (lime)	tonne	9.00			
Aggregates size 19 to 9.5 mm	cum	75.00			
Aggregates size 9.5 to 6 mm	cum	87.00			
Aggregates size 6 to 0.075 mm	cum	108.00			
c) Equipment					
Drum mix plant	hour	6.00			
Generator	hour	6.00			
Paver finisher	hour	6.00			
Pneumatic tired roller	hour	6.00			
Smooth wheeled steel tandem roller	hour	6.00			
(ii) Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate					
a) Labour					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			Unskilled	day	16.00
			Skilled	day	6.00
			b) Material		
			Bitumen emulsion	tonne	36.00
			Filler (lime)	tonne	9.00
			Aggregates size 37.5 to 19 mm	cum	75.00
			Aggregates size 19 to 6 mm	cum	90.00
			Aggregates size 6 to 0.075 mm	cum	105.00
			c) Equipment		
			Drum mix plant for cold mixes	hour	6.00
			Generator	hour	6.00
			Paver finisher	hour	6.00
			Pneumatic tired roller	hour	6.00
			Smooth wheeled steel tandem roller	hour	6.00
	(iii)		Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate		
			a) Labour		
			Unskilled	day	16.00
			Skilled	day	6.00
			b) Material		
			Cutback bitumen	tonne	22.50
			Filler (lime)	tonne	9.00
			Aggregates size 19 to 9.5 mm	cum	78.00
			Aggregates size 9.5 to 6 mm	cum	93.00
			Aggregates size 6 to 0.075 mm	cum	108.00
			c) Equipment		
			Drum mix plant for cold mixes	hour	6.00
			Generator	hour	6.00
			Paver finisher	hour	6.00
			Pneumatic tired roller	hour	6.00
			Smooth wheeled steel tandem roller	hour	6.00
	(iv)		Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate		
			a) Labour		
			Unskilled	day	16.00
			Skilled	day	6.00
			b) Material		
			Cutback bitumen	tonne	22.50
			Filler (lime)	tonne	9.00
			Aggregates size 37.5 to 19 mm	cum	75.00
			Aggregates size 19 to 6 mm	cum	90.00
			Aggregates size 6 to 0.075 mm	cum	114.00
			c) Equipment		
			Drum mix plant for cold mixes	hour	6.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity	
13.15	1312	Generator	hour	6.00	
		Paver finisher	hour	6.00	
		Pneumatic tired roller	hour	6.00	
		Smooth wheeled steel tandem roller	hour	6.00	
		Remarks			
		1. Density of aggregates has been assumed 1.5 gms/cc			
		2. Tack coat where provided will be measured and paid separately.			
		3. The use of other types of cold asphalt is expected to applied easily in short time even in heavy traffic loads in extreme climatic conditions, thus justifying the entire cost of adding modifiers.			
		4. Detailed information and inductive dose level on the use of such asphalt products should be based on manufacturer's recommendations , test reports and cost effectiveness in road works.			
		5. Ready made proprietary item available in market as pre-packed Asphalt concrete is required to be applied as per instructions of the manufacturer.			
		Sand Asphalt Base Course			
		Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base as per Drawing and Technical Specifications.			
		<i>Unit = cum[for 205 cum (450 tonne)]</i>			
		a) Labour			
		Unskilled	day	16.00	
		Skilled	day	6.00	
		b) Material			
		Bitumen	tonne	22.50	
		Filler (lime)	tonne	9.00	
		Sand of size 4.75 to 0.075 mm	cum	288.62	
		c) Equipment			
		Hot Mix Plant	hour	6.00	
		Generator	hour	6.00	
		Paver finisher	hour	6.00	
		smooth wheeled roller	hour	12.00	
		Vibratory roller	hour	6.00	
		Remarks			
		1. Tack coat will be measured and paid separately as specified in item no 13.2			
13.16	1300	Anti- Stripping agent			
		Providing and mixing of Anti stripping agent as per Design/ direction of Engineer			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
13.17	1300	<i>Unit = Kg (For 200 kg)</i>		
		a) Labour		
		Skilled	day	0.01
		Unskilled	day	1.00
13.18	1300	b) Material		
		Additive material	kg	210.00
		c) Equipment		
		Add 3 percent of Labour component for T&P		
13.19	1315	Bitumen Cutter		
		Providing and mixing of Bitumen cutter as per design / direction of Engineer		
		<i>Unit = lit. (For 200 lit)</i>		
		a) Labour		
13.18	1300	Skilled	day	0.01
		Unskilled	day	1.00
		b) Material		
		Kerosene/ Diesel cutter	Lit	210.00
13.19	1315	c) Equipment		
		Add 3 percent of Labour component for T&P		
		Modified Binder		
		Supply of modified binder (produced by mixing bitumen with modifier such as natural rubber or crumb rubber or any other polymer found compatible with bitumen) as per Specifications and direction of the Engineer.		
13.19	1315	<i>Unit = tonne</i>		
		a) Material		
		Modified binder	tonne	1.00
		Otta seal		
13.19	1315	Providing and laying Otta seal surface as wearing course in single coat using river bed shingles /aggregates of specified size (0- 16 mm) laid on prepared surface as per Drawing and Technical Specifications.		
		<i>Unit = sqm [For 4200 sqm]</i>		
		a) Labour		
		Unskilled	day	18.00
13.19	1315	Skilled	day	2.00
		b) Material		
		Bitumen	tonne	6.43
		Crushed stone chipping, 0-16 mm size	cum	67.20
13.19	1315	c) Equipment		
		Bitumen Boiler	hour	4.20
		Air compressor	hour	6.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity	
13.20		1313	Hydraulic self propelled chip spreader	hour	6.00	
			Bitumen Sprayer	hour	6.00	
			Smooth wheeled roller	hour	24.00	
			Remarks:			
			(ii)	Coarse sand seal As specified in Item no 13.11.		
			(i)	Recipe Cold Mix Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tired roller initially and finished with a smooth steel wheel roller, all as per specifications. <i>Unit = cum [For 205 cum (450 tonne)]</i> 75 mm thickness		
				a) Labour		
				Unskilled	day	12.00
				Skilled	day	6.00
				b) Material		
				Bitumen emulsion	tonne	20.25
				Crushed stone aggregates 40 mm nominal size	cum	297.00
				Cost of water	KL	6.00
				c) Equipment		
				Cold mix plant	hour	6.00
	Generator	hour	6.00			
	Paver finisher	hour	6.00			
	Pneumatic tired roller	hour	6.00			
	Smooth wheeled steel roller	hour	6.00			
(ii)	40 mm thickness					
	a) Labour					
	Unskilled	day	12.00			
	Skilled	day	6.00			
	b) Material					
	Bitumen emulsion	tonne	31.50			
	Crushed stone aggregates 14 mm nominal size	cum	287.00			
	Cost of water	KL	6.00			
	c) Equipment					
	Cold mix plant	hour	6.00			
	Generator	hour	6.00			
	Paver finisher	hour	6.00			
	Pneumatic tired roller	hour	6.00			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
	(iii)		Smooth wheeled steel roller	hour	6.00
			25 mm thickness		
			a) Labour		
			Unskilled	day	12.00
			Skilled	day	6.00
			b) Material		
			Bitumen emulsion	tonne	38.25
			Crushed stone aggregates 6 mm nominal size	cum	270.00
			Cost of water	KL	6.00
			c) Equipment		
			Cold mix plant	hour	6.00
			Generator	hour	6.00
			Paver finisher	hour	6.00
			Pneumatic tired roller	hour	6.00
			Smooth wheeled steel roller	hour	6.00
	Remark		1. These mixes are considered suitable for minor repair work and temporary road surface improvement. 2. In case concrete mixtures are required to be used for mixing, a number of these will be needed to match the capacity of road rollers. 3. Tack coat, where provided, will be measured and paid separately.		
13.21		1300	Mastic Asphalt Providing and laying 25 mm thick mastic asphalt wearing course excluding prime coat with paving grade bitumen including providing antiskid surface with bitumen pre-coated fine grained hard stone chipping at an spacing of 10 cm center to center in both directions all complete as per Drawing and Technical specifications. <i>Unit = sqm [For 140 sqm (8 tonne)(3.48 cum) assuming a density of 2.3 tonne/cum.]</i>		
			a) Labour		
			Unskilled	day	40.00
			Skilled	day	4.00
			b) Material		
			Base mastic (without coarse aggregates) = 60 per cent		
			Coarse aggregate(3.35 mm to 9.5 mm size) = 40 per cent .		
			Proportion of Material required for mastic asphalt with coarse aggregates		
			i) Bitumen @ 10.2 % by weight of mix	tonne	0.86
			ii) Crusher stone dust @ 31.9 %	cum	1.72
			iii) Lime stone dust @ 17.92 %	tonne	1.58

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
		iv) Coarse aggregates 6.3 mm to 13.2 mm size @ 40 %	cum	2.42
		v) Pre-coated stone chips of 13 mm nominal size @ 0.005 cum per 10 sqm	cum	0.08
		vi) Bitumen for coating of chips @ 2 % by weight	kg	2.20
		c) Equipment		
		Mechanical broom	hour	1.00
		Air compressor	hour	1.00
		Mastic cooker	hour	6.00
		Bitumen boiler	hour	6.00
		Tractor	hour	1.00
	Remarks	1. The rates for 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.		

SECTION 1400 - KERBS AND FOOTPATH

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
14.1		1401	<p>Precast Cement Concrete M 20 Kerb Providing and laying of /20 precast cement concrete Kerb 38 cm * 20 cm * 25 cm (H*B*L) with 12 mm thick 1:3 cement sand mortar bedding and joints including foundation excavation levelling but excluding foundation concrete for foundation or sand gravel material, all complete as per Drawing and Technical Specifications. <i>Unit = meter (For 400 meter)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Precast / cast in situ concrete block of /20 Concrete (0.38 m * 0.20 m * 0.25 m (H*B*L)) Coarse sand 30 per cent Cement Cost of water</p> <p>c) Equipment Kerb Casting Machine Concrete Mixer</p>	day day nos cum tonne KL hour hour	3.00 16.00 1600.00 1.20 0.52 0.20 6.00 12.00
	Remarks		Foundation concrete or sand gravel to be measured and paid separately as required from respective clause of specification.		
14.2	A	1401	<p>Cast in Situ Cement Concrete or natural stone block for footpath Providing and laying of precast / cast in situ 50 mm thick cement concrete slab footpath on 12 mm thick 1: 3 cement sand mortar over the prepared base, all complete as per Drawing and Technical Specifications. <i>Unit = Sqm (For 10 Sqm)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Precast / cast in situ concrete block of M 20/20 (50 mm CC Block) Coarse sand Cement Cost of water</p>	day day sqm cum tonne KL	1.50 4.00 11.00 0.13 0.07 0.02
	Remarks		Foundation concrete or sand gravel to be measured and paid separately as required from respective clause of specification.		
	B		<p>Providing and laying 25 mm thick Natural stone slab footpath on 12 mm thick 1: 3 cement sand mortar over the prepared base, all complete as per specification. <i>Unit = sqm meter (For 10 sqm)</i></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
14.3	1401	a) Labour		
		Skilled	day	2.00
		Unskilled	day	3.00
		b) Material		
		50 mm thick natural stone slab	sqm	11.00
		sand	cum	0.13
		Cement	tonne	0.07
		Cost of water	KL	0.02
		Cast in Situ Cement Concrete Kerb		
		Providing and laying cement concrete Kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond Kerb stone, Kerb stone laid with Kerb laying machine, foundation concrete laid manually, all complete as per Drawing and Technical Specifications.		
		<i>Unit = meter [For 360 meter (24.21 cum concrete, = 12.6 cum, M 10= 11.61 cum)]</i>		
		a) Labour		
		Skilled	day	6.00
		Unskilled	day	60.00
b) Material				
Crushed stone aggregate 20 mm	cum	21.80		
Coarse sand	cum	10.90		
Cement	tonne	7.53		
Cost of water	KL	30.00		
c) Equipment				
Kerb casting machine	hour	8.00		
Concrete mixer	hour	8.00		
14.4	1401	Cast in Situ Cement Concrete M 20 Kerb with Channel		
		Providing and laying cement concrete Kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on grade foundation 150 mm thick, Kerb channel 300 mm wide, 50 mm thick in PCC grade, sloped towards the Kerb, Kerb stone with channel laid with Kerb laying machine, foundation concrete laid manually, all complete as specification.		
		<i>Unit = meter [For 300 meter length (= 17.48, =23.18 cum)]</i>		
		a) Labour		
		Skilled	day	6.00
		Unskilled	day	70.00
		b) Material		
		Crushed stone aggregate 20 mm	cum	36.59
		Coarse sand	cum	18.30

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
14.5	A	1403	Cement	tonne	11.34
			Cost of water	KL	36.00
			c) Equipment		
			Kerb casting machine	hour	18.00
			Concrete mixer	hour	18.00
			Water tanker	hour	18.00
			Brick work for footpath		
	Providing and laying brick on edge over 60 mm thick sand bed in footpath including excavation sand bedding all complete as per Drawing and Technical Specifications.				
	<i>Unit = sqm (For 10 sqm)</i>				
	a) Labour				
	Skilled	day	1.00		
	Unskilled	day	3.00		
	b) Material				
	Brick	nos	725.00		
Coarse sand	cum	0.70			
B			Providing and laying flat brick over 60 mm thick sand bed in footpath including excavation sand bedding all complete as per specification.		
			<i>Unit = sqm (For 20 sqm)</i>		
			a) Labour		
			Skilled	day	1.50
			Unskilled	day	4.00
			b) Material		
			Brick	nos	750.00
sand	cum	1.40			

SECTION 1500 - TRAFFIC SIGN, ROAD MARKING , ROAD

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
15.1	1501	<p>TRAFFIC SIGN</p> <p>Non Reflective Traffic Signs</p> <p>Providing and fixing of Non reflective warning, mandatory and informatory sign board of 2 mm thick MS Sheet with back support frame fixed on heavy 50 mm tube or Channel section of 75 mm X 40 mm firmly fixed to the ground by means of properly designed foundation with M 10/40 grade cement concrete 300 mm x 300 mm x 300 mm, l as per drawings and Technical Specification/ DOR Publication.</p> <p>Unit = no. (For 4 traffic sign)</p> <p>(i) Excavation for foundation</p> <p>(ii) Cement concrete M 10 grade</p> <p>iii) Painting angle iron post two coats</p> <p>(a) Labour (For fixing at site)</p> <p>Skilled</p> <p>Unskilled</p> <p>b) Material</p> <p>Support of traffic sign</p> <p>(I) Mild steel Channel iron 75 x 40 x 6 mm, 3.0 m long @ 6.8 kg/m incl. 5 % wastage</p> <p>OR</p> <p>Heavy duty steel tube of internal dia 50 mm (6.19 kg/m), 3 m long including 5 % wastage</p> <p>(II) Angle iron 50 x 50 x 6 mm for hold fast including 5% wastage</p> <p>Add 2 per cent of cost of angle iron/ steel tube towards cost of drilling holes, nuts, bolts etc.</p> <p>(i) 90 cm height equilateral triangle</p> <p>OR</p> <p>(ii) 60 cm height equilateral triangle</p> <p>OR</p> <p>(iii) 60 cm circular</p> <p>OR</p> <p>(iv) 80 cm x 60 cm rectangular</p> <p>(c) Equipment</p> <p>Tractor with trolley</p>	<p>cum</p> <p>cum</p> <p>sqm</p> <p>day</p> <p>day</p> <p>kg</p> <p>m</p> <p>kg</p> <p>sqm</p> <p>sqm</p> <p>sqm</p> <p>sqm</p> <p>hour</p>	<p>0.21</p> <p>0.11</p> <p>3.51</p> <p>1.00</p> <p>2.00</p> <p>85.68</p> <p>12.60</p> <p>4.24</p> <p>1.00</p> <p>0.44</p> <p>1.20</p> <p>2.02</p> <p>3.00</p>
	Remarks	<p>1. Rate of other size traffic sign is determine from adjusting area of traffic sign considering 5 % addition for wastage. Similarly mounting post (size of steel channel or steel tube) is adjusted as per site condition.</p> <p>2. The rate for excavation, cement concrete M-10, and painting may be taken from respective Chapters.</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
15.2	1501	3. The depth of foundation, height of tube/ Angle and quantity of cement in the foundation are indicative. The foundation for signs mounted on two or more post will be 45 cm X 45 cm X 60 cm. These may be increased for areas having higher wind velocities. This is applicable to all road signs and direction boards.		
		Retro-Reflectorized Traffic Signs		
		Providing and fixing of retro- reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5 mm thick supported on a 50 mm internal dia steel tube or mild steel angle iron post 75 mm x 40 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M 10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications.		
		<i>Unit = no. (For 10 traffic sign)</i>		
		i) Excavation for foundation	cum	0.54
		ii) Cement concrete M 10 grade	cum	0.27
		iii) Painting angle iron post two coats	sqm	8.78
		a) Labour (For fixing at site)		
		Skilled	day	1.00
		Unskilled	day	3.00
		b) Material		
		Mild steel angle iron 75 x 40 x 6 mm, 3. m long @ 6.8 kg/m	kg	204.00
		Aluminum sheeting fixed with encapsulated lens type reflective sheeting of size including lettering and signs as applicable		
		Add 2 per cent of cost of angle iron towards cost of drilling holes, nuts, bolts etc.		
		(i) 90 cm height equilateral triangle	sqm	2.40
OR				
(ii) 60 cm height equilateral triangle	sqm	1.04		
OR				
(iii) 60 cm circular	sqm	2.83		
OR				
(iv) 80 mm x 60 mm rectangular	sqm	4.80		
OR				
(v) 60 cm x 45 cm rectangular	sqm	2.70		
c) Equipment				
Tractor-trolley	hour	3.00		
Remarks		1. Any one area of aluminum sheeting given at (i) to (v) may be adopted as per site requirement and in accordance with DOR publication 2. Rate of other size traffic sign is determine from adjusting area of traffic sign. Similarly size and type of mounting post (steel channel / steel tube) is adjusted as per site condition.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
15.3	1502	3. The rate for excavation, cement concrete M-10, and painting may be taken from respective Chapters.		
		4. The depth of foundation, height of tube/ Angle and quantity of cement in the foundation are indicative. The foundation for signs mounted on two or more post will be 45 cm X 45 cm X 60 cm. These may be increased for areas having higher wind velocities . This is applicable to all road signs and direction boards.		
		Overhead Signs		
		Providing and erecting overhead signs with a corrosion resistant 2 mm thick aluminum alloy sheet reflectorized with micro prismatic retro-reflective type with vertical and lateral clearance as per drawing and installed as per Specification over a designed support system of aluminum alloy or galvanized steel trusses of sections and type as per structural design requirements , Drawing and Technical Specifications.		
		Truss and Vertical Support <i>Unit = tonne (For 1 tonne)</i>		
		a) Labour Skilled / Blacksmith Unskilled	day day	1.00 6.00
b) Material Aluminum alloy/galvanized steel including 5 per cent wastage	tonne	1.05		
		Add 1 per cent on cost of Material for nuts, bolts and drilling and welding consumables Add 15 per cent on cost of Material for fabrication of trusses as per approved design		
		c) Equipment Crane Truck	hour hour	6.00 6.00
		Aluminum Alloy Plate for Over Head Sign <i>Unit = sqm (For 10 Sqm)</i>		
		a) Labour Skilled/ Blacksmith Unskilled	day day	2.00 3.00
		b) Material Aluminum alloy plate, 2 mm thick, fixed with Retro reflective sheeting	sqm	11.00
		Miscellaneous Add 1 per cent of cost of Labour for lifting arrangement, like ladders, pulleys, ropes etc.		
Remarks		1. The cost of excavation and foundation concrete for fixing of vertical support system to be worked out separately as per the approved drawing/design and to be included in the estimate.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
15.4	1501	<p>2. Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been included separately in this chapter.</p> <p>Painting Two Coats on Concrete Surfaces Providing and Painting two coats after filling the surface with synthetic enamel paint in all shades on concrete / plaster surfaces as per Drawing and Technical Specifications. <i>Unit = sqm (For 10 sqm)</i></p> <p>a) Labour Skilled /Painter Unskilled</p> <p>b) Material Paint Add for scaffolding @ 1 per cent of Labour cost where required Add @ 5 per cent cost of Labour and Materials to prepare the surface by filling minutes roughness on the surface and priming the surface before laying 2 coats of painting.</p>	day day liter	3.00 2.00 6.00
15.5	1501	<p>Painting on Steel Surfaces Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade as per Drawing and Technical Specifications. <i>Unit = sqm (For 20 sqm)</i></p> <p>a) Labour Skilled/ Painter Unskilled</p> <p>b) Material Paint Add @ 1 per cent on cost of Material for scaffolding Add @ 5 per cent cost of Labour and Materials to prepare the surface by filling minutes roughness on the surface and priming the surface before laying 2 coats of painting.</p>	day day liter	1.00 1.00 2.50
15.6	1509	<p>Painting on Wood Surfaces Providing and applying two coats of ready mix paint of approved brand on wood surface after thorough cleaning of surface to give an even shade as per Drawing and Technical Specifications. <i>Unit = sqm (for 15 sqm)</i></p> <p>a) Labour Skilled / Painter Unskilled</p> <p>b) Material Paint Add @ 1 per cent on cost of Material for scaffolding</p>	day day liter	1.00 1.00 2.25

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
15.7	1503	Add @ 5 per cent cost of Labour and Materials to prepare the surface by filling minutes roughness on the surface and priming the surface before laying 2 coats of painting.		
		Painting Lines, Dashes, Arrows etc. on Roads in Two Coats		
		Providing required material and Painting lines, dashes, arrows etc. on roads in two coats on new work with ready mixed road marking paint conforming to NS 408/ IS 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per Drawing and Technical Specifications.		
		Over 10 cm in width		
		<i>Unit = sqm (For 10 sqm)</i>		
		a) Labour		
		Skilled/ Painter	day	1.00
		Unskilled	day	2.00
		b) Material		
		Road marking Paint as per NS 408/ IS :164	liter	1.48
15.8	1503	Painting Lines, Dashes, Arrows etc. on Roads in Two Coats on Old Work		
		Providing required materials and Painting lines, dashes, arrows etc. on roads in two coats on old work with ready mixed road marking paint conforming to NS 408/ IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per Drawing and Technical Specifications.		
		Over 10 cm in width		
		<i>Unit = sqm(For 10 sqm)</i>		
		a) Labour		
		Skilled / Painter	day	1.00
		Unskilled	day	2.00
		b) Material		
		Road marking paint	liter	1.48
		15.8	1503	Painting Lines, Dashes, Arrows etc. on Roads in Two Coats on Old Work
Providing required materials and Painting lines, dashes, arrows etc. on roads in two coats on old work with ready mixed road marking paint conforming to NS 408/ IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per Drawing and Technical Specifications.				
Over 10 cm in width				
<i>Unit = sqm(For 10 sqm)</i>				
a) Labour				
Skilled / Painter	day			1.00
Unskilled	day			2.00
b) Material				
Road marking paint	liter			0.90
15.8	1503			Up to 10 cm in width
		<i>Unit = sqm(For 101 sqm)</i>		
15.8	1503	a) Labour		
		Skilled / Painter	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
15.9	1504	Unskilled	day	2.00
		b) Material		
		Road marking Paint	liter	0.90
		i		
		Road Marking with Hot Applied Thermoplastic Compound with Reflectorizing Glass Beads on Bituminous Surface		
		On smooth surface (similar to Asphalt concrete and rigid pavement)		
		Providing and laying of hot applied thermoplastic compound at least 2 mm thick including reflectorizing glass beads as per DOR Traffic sign manual/ Specifications .The finished surface to be level, uniform and free from streaks and holes.		
		Unit = sqm (For 400 sqm)		
		a) Labour		
		Skilled / Painter	day	2.00
		Unskilled	day	4.00
		b) Equipment		
		Road marking machine (boiler + Applicator + Template)	hour	10.00
		Tractor-trolley	hour	10.00
c) Material				
Hot applied thermoplastic compound	liter	930.00		
Reflectorizing glass beads	kg	100.00		
Remarks		1. A sealing primer may be applied in advance on cement concrete pavement to ensure proper bonding. Any laitance and/or curing compound to be removed where paint is required to be applied on concrete surface. 2. Cost of painter is already included in hire charges of road marking machine.		
		ii		
		On rough surface (similar to surface dressing)		
		Providing and laying of hot applied thermoplastic compound at least 2 mm thick including reflectorizing glass beads as per DOR Traffic sign manual/ Specifications .The finished surface to be level, uniform and free from streaks and holes.		
		Unit = sqm (For 300 sqm)		
		a) Labour		
		Skilled / Painter	day	2.00
		Unskilled	day	4.00
		b) Equipment		
		Road marking machine (boiler + Applicator + Template)	hour	10.00
		Tractor-trolley	hour	10.00
		c) Material		
		Hot applied thermoplastic compound	liter	1200.00
		Reflectorizing glass beads	kg	150.00
Remarks		1. Cost of applicator is already included in hire charges of road marking machine.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
15.10		1505	Providing and fixing of road stud 100x 100 mm, die-cast in aluminum, resistant to corrosive effect of salt and grit, fitted with lenses reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per Specification clause 1505.		
			Providing and fixing of road stud 100 x 100 mm, die-cast in aluminum, resistant to corrosive effect of salt and grit, fitted with lenses reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per Drawing and Technical Specifications. Unit = no. (For 50 Nos)		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	2.00
			b) Material		
			i. Aluminum studs 100 x 100 mm fitted with lenses reflectors	nos.	50.00
			OR		
			ii. Solar power studs	nos.	50.00
			OR		
iii. Cats eye	nos.	50.00			
i			Aluminum studs 100 x 100 mm fitted with lenses reflectors Add 10 per cent of cost of Material for fixing and installation		
ii			Solar power studs Add 10 per cent of cost of Material for fixing and installation		
iii			Cats eye Add 10 per cent of cost of Material for fixing and installation		
15.11	(i)	1506	Kilometer Stone		
			Providing and Fixing Reinforced cement concrete M 15 grade kilometer Post including painting and printing as per Standard Drawing-2070 and Technical Specifications. position		
			Five kilometer Post (precast) <i>Unit = no. (For 6 Nos.)</i>		
			a) i. M-15 grade of concrete	cum	1.20
			a) ii M-10 grade of concrete	cum	1.20
			b) Steel reinforcement	kg	63.60
			c) Excavation in soil for foundation	cum	1.20
			d) Painting two coats on concrete surface	sqm	10.20
			e) Lettering on km post	cm-letter	1800.00
			Transportation and fixing at site		
f) Labour					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled	day	1.00
		Unskilled	day	6.00
		g) Equipment		
		Tractor-trolley	hour	3.00
	Remarks	1. The rate for excavation, cement concrete , reinforcement., painting and lettering may be taken from respective Sections.		
		2. Average 30 letter of 10 cm height has been considered for calculation.		
	(ii)	One kilometer post (precast)		
		<i>Unit = no.(For 14 Nos.)</i>		
		a) i. M-15 grade of concrete	cum	1.40
		a) ii M-10 grade of concrete	cum	2.38
		b) Steel reinforcement as per standard drawing	kg	82.88
		c) Excavation in soil for foundation	cum	2.38
		d) Painting two coats on concrete surface	sqm	11.90
		e) Lettering on km post	cm - letter	1680.00
		Transportation and fixing at site		
		f) Labour		
		Skilled	day	2.00
		Unskilled	day	7.00
		g) Equipment		
		Tractor-trolley	hour	3.00
	Remarks	1. The rate for excavation, cement concrete , reinforcement., painting and lettering may be taken from respective Chapters.		
		2. Average 12 letter of 10 cm height has been considered for calculation.		
15.12	1507	Road Delineators Post		
		Providing and installation of 150 mm * 150 mm 1.5 m long delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 20 cm wide strips, buried or pressed into the ground and conforming to the drawings and Technical Specifications.		
		<i>Unit = no. (For 30 Nos.)</i>		
		a) M-15 grade of concrete	cum	1.01
		b) Steel reinforcement as per standard drawing (4 Nos 8 mm dia and 11 Nos 6 mm dia stirrups)	kg	112.80
		c) Excavation in soil for foundation	cum	0.47
		d) Painting two coats on concrete surface	sqm	14.40
		Transportation and fixing		
		e) Labour		
		Skilled (Mason)	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Unskilled	day	7.00
		f) Equipment		
		Tractor-trolley	hour	3.00
		1. The rate for excavation, cement concrete , reinforcement., painting and lettering may be taken from respective Chapters.		
	Remarks	In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.		
15.13	1508	Reinforced Cement Concrete Crash Barrier Providing and Fixing Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 grade concrete with HYSD reinforcement and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-molded asphalt filler board, keyed to the structure on which it is built and installed as per design, Drawing and Technical Specifications. <i>Unit = meter (For 10 m)</i> Taking output = 10 m		
	(i)	a) M 20 grade concrete M 20 grade concrete	cum	3.00
		b) Labour		
		Skilled	day	1.00
		Unskilled	day	2.00
		c) Material		
		HYSD steel reinforcement including dowel bars (providing and laying all complete)	tonne	0.28
		Pre-molded asphalt filler board	sqm	0.32
		Excavation and backfilling : 25 % of Labour component		
15.14	1509	Metal Beam Crash Barrier		
	A	Type - A, "W" : Metal Beam Crash Barrier Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m center to center, 1.8 m high, 1.1 m below ground/road level metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per Drawing and Technical Specifications. <i>Unit = meter (For 40 m. length)</i>		
		a) Labour		
		Skilled (Blacksmith)	day	1.00
		Unskilled	day	10.00
		b) Material		
		Hot dip galvanized Corrugated W beam sheet 3 mm thick	kg	563.61

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Hot dip galvanized Channel post 150 x 75 x 5 mm, Hot dip galvanized Spacer Channel 150 x 75 x 5 mm M 20 grade concrete E/W excavation for post Add 25 per cent of the cost of Material for fabrication, nuts, bolts and washers etc.) c) Equipment Tractor-trolley	kg kg cum cum hour	695.52 127.51 0.99 0.99 3.00
	Remarks	1 The items for end treatment for steel barrier (turned down guard rail and Anchored in back slope) related items such as excavations and cement concrete works , post and rail etc. shall be measured and included separately as per the approved designs and drawings. 2 In case of double W beam , increase the above 3 mm thick corrugated w Beam sheet and nut Bolt 2 times in above figure.		
		B Type - B, "THRIE" : Metal Beam Crash Barrier Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m center to center, 2.1 m high with 1.3 m below ground level, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per Drawing and Technical specifications. <i>Unit = meter (For 40 m. length)</i> a) Labour Skilled(Blacksmith) Unskilled b) Material Hot dip galvanized Corrugated thrie beam sheet 3 mm thick Hot dip galvanized Channel post 150 x 75 , 5 mm Hot dip galvanized Spacer Channel 150 x 75 x 5 mm , M 20 grade concrete E/W excavation for post Add 25 per cent of the cost of Material for fabrication, nuts, bolts and washers etc.) c) Equipment Tractor-trolley	day day kg kg kg cum cum hour	1.00 12.00 913.19 811.44 137.64 1.13 1.13 3.00
	Remarks	The items for end treatment for steel barrier related items such as excavations and cement concrete works , post and rail etc. shall be measured and included separately as per the approved designs and drawings.		
	C	Flexible Crash Barrier, Wire Rope Safety Barrier		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per design , Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 15 m.)</i> Taking output = 15 meter</p> <p>a) Labour Unskilled day 4.00 Skilled (Blacksmith) day 2.00</p> <p>b) Material i) RS Joist 100 x 75 mm - 16.5 m kg 190.00 ii) Struts - 2 Nos. for terminal posts, 2 m long each 2 x 2 x 11.50 kg 46.00 iii) Tie 2 Nos. of 8 mm steel plate, 1.5 sqm each for terminal posts kg 188.40 iv) Steel wire rope 40 mm, kg 65.00</p> <p>M 20 grade concrete cum 1.13 E/W excavation for post cum 1.13 Add 5 per cent of cost of Material for drilling, gripping, fixing, fabrication and welding consumables</p> <p>c) Painting Applying 2 coats of painting on exposed surface sqm 16.50</p> <p>d) Equipment Tractor-trolley hour 3.00</p> <p>The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.</p>		
	Remarks			
15.15	2800/1500	Anti-Glare Devices in Median		
	A	Plantation Providing and Plantation of shrubs and plants of approved species in the median. apart from cutting off glare from vehicle coming from opposite direction, Detail as per Section 2800		
	B	Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vans		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one meter length and 1.75 meter height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per design , drawings and Technical Specifications.</p> <p><i>Unit = meter (For 10 m.)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 2.00</p> <p>b) Material i) 25 mm steel pipe meter 160.00 ii) MS sheet for 600 x 300 x 3 mm rectangular vane, kg 43.20 iii) MS sheet for 250 mm dia circular vane 3 mm thick, 4 numbers kg 48.00 Add 5 per cent cost of Material for fabrication, welding, bending, nuts, bolts etc.</p> <p>c) Painting Applying 2 coats of painting on exposed surface sqm 18.30</p>		
	Remarks	<p>The items of excavation and cement concrete as per approved design to be measured and paid separately</p> <p>Anti-glare screen with rectangular vane of MS sheet</p> <p>Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick and fixed on MS angle 50 x 50 x 6 mm at an angle of 450 to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in M-15 cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on exposed faces, all complete as per design , Drawing and Technical Specifications.</p> <p><i>Unit = meter (For 15 m.)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 2.00</p> <p>b) Material i) Angle iron post, 50 x 50 x 6 mm, length 2.35 m kg 106.00 ii) MS sheet 3 mm thick @ 24 kg/sqm kg 90.00 Add 5 per cent of cost of Material for fabrication, nuts, bolts etc.</p> <p>c) Equipment Tractor-trolley hour 3.00</p> <p>d) Painting Applying 2 coats of painting sqm 8.50</p>		
	C			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>The items of excavation and cement concrete as per approved design to be measured and paid separately. Rate of painting has been analyzed separately in this chapter.</p>		
15.16		<p>Street Lighting Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapor lamp and fixed firmly in concrete foundation as per design, Drawing and Technical Specifications..</p> <p><i>Unit = no. (For one light)</i></p> <p>a) Labour Unskilled day 1.00 Skilled (Electrician) day 1.00</p> <p>b) Material i) Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level nos 1.00 ii) Sodium vapor lamp nos 1.00 Add 5 per cent of cost of Material for holder, electric cable, insulation, ladder, scaffolding etc.</p> <p>c) Painting For Fixing in Median Providing two coats of aluminum paint over steel circular hollow pipe with overhang on both sides sqm 5.75 For fixing in Footpath Providing two coats of aluminum paint over steel circular hollow pipe with overhang on one side sqm 4.63</p>		
		<p>The items of excavation and cement concrete foundation will be measured and included separately in the estimate as per approved design and drawing. The rate for painting has been analyzed in this chapter.</p>		
15.17	1300	<p>Rumble Strips Providing and making of Rumble strips with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint. Provision of 15 Nos rumble strips covered with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint. <i>Unit = sqm (For 100 sqm. Including gaps)</i> The rate per sqm of premix carpet and road marking may be adopted from chapter 13 & 15 respectively for the quantities calculated from approved drawings</p>		
15.18	1506	<p>Lettering new Letter and Figures of any Shade</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	(i)	<p>Providing and lettering new letter and figures of any shade with synthetic enamel paint black or any other approved color to give an even shade</p> <p>Nepali <i>Unit = cm - letter (for 100 letters of 16 cm height i.e. 1600 cm-letter)</i></p> <p>a) Labour Skilled (Painter) day 4.00 Unskilled day 2.00</p> <p>b) Material Paint liter 0.70</p>		
	(ii)	<p>English and Roman <i>Unit = cm - letter (for 100 letters of 16 cm height. i.e. 1600 cm-letter)</i></p> <p>a) Labour Skilled (Painter) day 2.00 Unskilled day 2.00</p> <p>b) Material Paint liter 0.50</p>		
	Remarks	<p>1. Nepali (Matras commas and the like not to be measured and paid for Half letter shall be counted as half)</p> <p>2 English - Hyphens and the like not to be measured and paid .</p>		

SECTION 1600 - PILING FOR STRUCTURES

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
16.1	A	1612	PILE FOUNDATION			
			Providing, Boring and installing bored cast-in-situ RCC Pile excluding Reinforcement and Concrete in all types of soil including Bentonite and other consumable and removal of excavated earth with necessary lifts and lead all complete as per Drawing and Technical Specifications.			
			Pile diameter-500 mm <i>Unit = meter (For 5 m depth.)</i>			
			a) Labour			
	Skilled	day	1.00			
	Unskilled	day	7.00			
	b) Materials					
	Bentonite	kg	75.00			
	c) Equipment (for boring and construction)					
	piling rig (with all accessories)	hour	2.50			
	Crane	hour	2.50			
	Bentonite pump	hour	2.50			
	B	1612	1612	Pile diameter-600 mm <i>Unit = meter (For 5 m depth.)</i>		
				a) Labour		
				Skilled	day	1.00
				Unskilled	day	10.00
b) Materials						
Bentonite	kg	100.00				
c) Equipment(for boring and construction)						
piling rig (with all accessories)	hour	3.00				
Crane	hour	3.00				
Bentonite pump	hour	3.00				
C	1612	1612	Pile diameter-750 mm <i>Unit = meter (For 5 m depth.)</i>			
			a) Labour			
			Skilled	day	2.00	
			Unskilled	day	15.00	
b) Materials						
Bentonite	kg	150.00				
c) Equipment(for boring and construction)						
Piling rig (with all accessories)	hour	4.50				
Crane	hour	4.50				
Bentonite pump	hour	4.50				
D	1612	1612	Pile diameter-1000 mm <i>Unit = meter (For 5 m depth.)</i>			
			a) Labour			
Skilled	day	2.00				

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
16.2	1612	Unskilled	day	20.00
		b) Materials		
		Bentonite	kg	220.00
		c) Equipment(for boring and construction)		
		piling rig (with all accessories)	hour	6.00
		Crane	hour	6.00
		Bentonite pump	hour	6.00
		Pile diameter-1200 mm		
		<i>Unit = meter (For 5 m depth.)</i>		
		a) Labour		
		Skilled	day	3.00
		Unskilled	day	25.00
		b) Materials		
		Bentonite	kg	320.00
c) Equipment(for boring and construction)				
piling rig (with all accessories)	hour	7.50		
Crane	hour	7.50		
Bentonite pump	hour	7.50		
	Remarks:	for Activity related to 16.1:		
		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 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 @ 2.5 per cent of cost of concrete may be provided to cover its usage.		
		3. If total quantity of pile length of a bridge required to bore in a bridge is less than 500 meter add cost for mobilization and demobilization of equipment based on site location as separate item in contract.		
		4. For boring depth 5 m to 10 m below the top of pile cap level add 10 % additional input of manpower and equipment componet on rate of upto 5m.		
		5. For boring depth 10 m to 15 m below the top of pile cap level add 15 % additional input of manpower and equipment on rate of upto 5m .		
		6. For boring depth > 15 m below the top of pile cap level add 20 % additional input of manpower and equipment on rate off upto 5m .		
		7. Rate analysis for Providing and placing Cement concrete and Reinforcement shall be as per section 2000.		
A		Providing, Boring and installing bored cast-in-situ RCC Pile excluding Reinforcement and Concrete in all types of Rock including Bentonite and other consumable and removal of excavated material with necessary lifts and lead all complete as per Drawing and Technical Specifications .		
		Pile diameter-300 mm		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<i>Unit = meter (For 5 m depth.)</i>		
		a) Labour		
		Skilled	day	2.00
		Unskilled	day	15.00
		b) Materials		
		Bentonite	kg	25.00
		c) Equipment (for boring and construction)		
		piling rig (with all accessories)	hour	3.00
		Crane	hour	3.00
		Bentonite pump	hour	3.00
B		Pile diameter-500 mm		
		<i>Unit = meter (For 5 m depth.)</i>		
		a) Labour		
		Skilled	day	2.00
		Unskilled	day	20.00
		b) Materials		
		Bentonite	kg	50.00
		c) Equipment (for boring and construction)		
		Piling rig (with all accessories)	hour	4.00
		Crane	hour	4.00
		Bentonite pump	hour	4.00
C		Pile diameter-600 mm		
		<i>Unit = meter (For 5 m depth.)</i>		
		a) Labour		
		Skilled	day	3.00
		Unskilled	day	30.00
		b) Materials		
		Bentonite	kg	100.00
		c) Equipment(for boring and construction)		
		Piling rig (with all accessories)	hour	5.00
		Crane	hour	5.00
		Bentonite pump	hour	5.00
D		Pile diameter-750 mm		
		<i>Unit = meter (For 5 m depth.)</i>		
		a) Labour		
		Skilled	day	3.00
		Unskilled	day	30.00
		b) Materials		
		Bentonite	kg	50.00
		c) Equipment(for boring and construction)		
		Piling rig (with all accessories)	hour	6.00
		Crane	hour	6.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
16.3	E	Bentonite pump	hour	6.00
		Pile diameter-1000 mm <i>Unit = meter (For 5 m depth.)</i>		
		a) Labour		
		Skilled	day	5.00
		Unskilled	day	50.00
		b) Materials		
		Bentonite	kg	75.00
		c) Equipment(for boring and construction)		
		Piling rig (with all accessories)	hour	9.00
		Crane	hour	9.00
Bentonite pump	hour	9.00		
	Remarks:	for Activity related to 16.2: 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 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 @ 2.5 per cent of cost of concrete may be provided to cover its usage. 3. If total quantity of pile length of a bridge required to bore in a bridge is less than 500 meter add cost for mobilization and demobilization of equipment based on site location as separate item in contract. 4. For boring depth 5 m to 10 m below the top of pile cap level add 10 % additional input of manpower and equipment componet on rate of upto 5m. 5. For boring depth 10 m to 15 m below the top of pile cap level add 15 % additional input of manpower and equipment on rate of upto 5m . 6. For boring depth > 15 m below the top of pile cap level add 20 % additional input of manpower and equipment on rate off upto 5m . 7. In case of Steep slope area , having limited space to install accessories of piling rig and inside well above manpower and equipment may be added additional 10 percent 8. Rate analysis for Providing and placing Cement concrete and Reinforcement shall be as per section 2000.		
		Providing, driving and installing precast RCC. pile of specified size and quality complete as per drawing and & Technical Specification Pile diameter -300 mm <i>Unit = Running meter (For 25 m.)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	5.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
B		b) Materials		
		RCC Grade M 35 or other as per Design	cum	1.94
		Reinforcement (as per design or 2.5 % of concrete)	kg	378.86
		Materials Pile shoes		
		i) C.I. shoes for the pile	Kg	14.40
		ii) M.S. clamps for shoe	Kg	6.30
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	4.50
		iv) Casing (As per design / 0.5 % of cost of concrete)		
		c) Equipment		
		Piling rig (with all accessories)	hour	6.00
		Crane	hour	3.00
		Pile diameter -500 mm		
		<i>Unit = Running meter (For 20 m.)</i>		
		a) Labour		
Skilled	day	1.00		
Unskilled	day	5.00		
b) Materials				
RCC Grade M 35 or other as per Design	cum	4.32		
Rate for concrete may be adopted same as for bottom plug				
Reinforcement (as per design or 2.5 % of concrete)	kg	841.91		
Materials Pile shoes				
i) C.I. shoes for the pile	Kg	40.00		
ii) M.S. clamps for shoe	Kg	17.50		
iii) Steel helmet and cushion block on top of casing head during driving	Kg	12.50		
iv) Casing (As per design / 0.5 % of cost of concrete)				
c) Equipment				
Piling rig (with all accessories)	hour	6.00		
Crane	hour	3.00		
C		Pile diameter - 600 mm		
		<i>Unit = Running meter (For 10 m.)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	5.00
		b) Materials		
		RCC Grade M 35 or other as per Design	cum	3.11
		Reinforcement (as per design or 2.5 % of concrete)	kg	606.18
		Materials Pile shoes		
		i) C.I. shoes for the pile	Kg	57.60
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	25.20
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	18.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
16.4	1613	iv) Casing (As per design / 0.5 % of cost of concrete)			
		c) Equipment			
		Piling rig (with all accessories)	hour	6.00	
		Crane	hour	3.00	
		Remarks:	for Activity related to 16.3:		
		<p>1. The quantity of concrete required to be removed above the designed top level of concrete, if any, will be calculated for in the estimate.</p> <p>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 @ 2.5 per cent of cost of concrete may be provided to cover its usage.</p> <p>3. For other shape and size of Pile , find quantities of Concrete and Reinforcement and determine rate proportionally</p> <p>4. Add 0.5 per cent of (a+b+c) for providing steel helmet on top of pile head during driving, stacking of piles at site</p>			
		Driving Vertical Steel Piles / Sheet piles excluding cost of steel complete as per Drawing and & Technical Specification			
		<i>Unit = tonne (For 2.5 tonne)</i>			
		a) Labour			
		Skilled	day	1.00	
Unskilled	day	5.00			
b) Materials					
Structural steel/ Sheet pile	tonne				
c) Equipment					
Crane	hour	6.00			
Piling rig (with all accessories)	hour	6.00			
Remarks	<p>1 .Determine Rate of steel pile/ sheet pile as specified in section 2200 for required shape and size including fitting, fixing, corrosion treatment/ painting etc.</p>				
Remarks for Section 1600:					
<p>I . Add @ 1.5% of equipment cost for shifting piling rig for each mt of pile.</p> <p>ii . Add @ 0.5 percent of equipment cost for erecting and dismantling of piling rig</p> <p>iii . Add @ 0.5% of equipment cost for Depreciation charges for track , wooden sleeper, fish plates, bolts dog spikes</p>					

SECTION 1700 - WELL FOUNDATIONS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
17.1	A	1700	<p>Providing and Constructing of temporary Island for well sinking as per Drawing and instruction of the Engineer. <i>Unit = no (For 1 no. for 8 m dia)</i> Assuming depth of water 1.0 m and height of island to be 1.25 m. and island 16 m diameter for Construction of Well Foundation for 8 m dia. Well.</p> <p>a) Labour Skilled day 0.40 Unskilled day 22.00</p> <p>b) Material Earth (compacted) cum 251.20 Sand bags Nos 750.00</p> <p>c) Equipment Crane hour 20.00 Consumables @ 2.5 per cent of equipment cost</p>		
			<p>Remarks: It is assumed that earth will be available within the working space of crane with grab bucket. For other size of well , and depth of island height norms shall be derived from extrapolations of well cross section</p>		
		B	<p>Providing and constructing one span service road to reach island location from one pier location to another pier location as per Drawing and instruction of the Engineer. <i>Unit = meter (For 30 meter)</i> Assuming span length 30 m, width of service road 10 m and depth of water 1 m</p> <p>a) Labour Skilled day 0.36 Unskilled day 9.00</p> <p>b) Material Earth cum 450.00 Sand bags Nos 300.00</p> <p>c) Equipment Loader hour 24.00 Tipper hour 24.00</p>		
17.2		1700	<p>Providing and Laying Cutting Edge of Mild Steel for Well <i>Unit = tonne (For 1 tonne)</i></p> <p>a) Labour (for cutting, bending, making holes, joining, welding and erecting in position) Skilled (Fitter + Black smith + Welder) day 21.00 Unskilled day 21.00</p> <p>b) Material Structural steel tonne 1.05 Nuts & bolts Kg 20.00 Electrodes, cutting gas and other consumables @ 10 per cent of cost of (a) above</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
17.3		1700, 2000	Providing and laying Plain/Reinforced Cement Concrete excluding reinforcement in Well Foundation all complete as per Drawing and Technical Specifications. <i>Unit = cum (For 1 cum)</i>			
	A	1703	Well curb			
	(i)		RCC M 20 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 C. d) formwork @ 20 per cent of the cost of concrete			
	(ii)		RCC M 25 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 E. d) formwork @ 20 per cent of the cost of concrete			
	(iii)		RCC M 30 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 G. d) formwork @ 20 per cent of the cost of concrete			
	Remarks:			If curb concrete is carried out within steel liner, cost of formwork shall be excluded.		
	B	1704	Well Steining			
	(i)		PCC M 20 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 B. d) formwork @ 10 per cent of the cost of concrete			
	(ii)		RCC M 20 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 C. d) formwork @ 10 per cent of the cost of concrete			
	(iii)		RCC M 25 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 E. d) formwork @ 10 per cent of the cost of concrete			
	(iv)		RCC M 30 Grade Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of item no 20.2 G. d) formwork @ 10 per cent of the cost of concrete			
	C	1706	Bottom Plug Concrete to be placed using tremie pipe			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity		
(i)		Note: 10% extra cement to be added where under water concreting is involved				
		PCC Grade M 20				
		<i>Unit = cum (For 15 cum)</i>				
		a) Labour				
		Skilled (Mason)	day	3.00		
		Unskilled	day	20.00		
		b) Material				
		Cement	tonne	5.55		
		Coarse sand	cum	6.75		
		40 mm Aggregate	cum	5.40		
		20 mm Aggregate	cum	5.40		
		10 mm Aggregate	cum	2.70		
		Admixture	Kg	18.60		
		c) Equipment				
		Concrete mixer	hour	6.00		
		Generator	hour	6.00		
		Crane	hour	6.00		
				Add 5 per cent of cost of Material and Labour towards cost of forming sump, protective bunds, chiseling and making arrangements for under water concreting with tremie pipe..		
(ii)		PCC Grade M 25				
		<i>Unit = cum (For 15 cum)</i>				
		a) Labour				
		Skilled (Mason)	day	3.00		
		Unskilled	day	20.00		
		b) Material				
		Cement	tonne	5.99		
		Coarse sand	cum	6.75		
		40 mm Aggregate	cum	5.40		
		20 mm Aggregate	cum	5.40		
		10 mm Aggregate	cum	2.70		
		Admixture	Kg	21.60		
		c) Equipment				
		Concrete mixer	hour	6.00		
		Generator	hour	6.00		
		Crane	hour	6.00		
				Add 5 per cent of cost of Material and Labour towards cost of forming sump, protective bunds, chiseling and making arrangements for under water concreting with tremie pipe..		
		D	(i)	Intermediate plug		
Grade M 20 PCC						
		Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc. (i.e.. 3 % of Labour cost)				

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	(ii)	Grade M 25 PCC Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc. (i.e.. 3 % of Labour cost)		
	E (i)	Top plug Grade M 15 PCC Same as Item PCC in open foundation excluding formwork		
	F (i)	Well cap RCC Grade M 20 <i>Unit = cum (For 15 cum)</i> a) Labour Skilled (Mason) Unskilled b) Material Cement Coarse sand 20 mm Aggregate 10 mm Aggregate c) Equipment Concrete mixer Generator d) Form Work @ 4 per cent of (a+b+c)	day day tonne cum cum cum hour hour	3.00 20.00 5.12 6.75 8.10 5.40 6.00 6.00
	(ii)	RCC Grade M 25 <i>Unit = cum (For 15 cum)</i> a) Labour Skilled (Mason) Unskilled b) Material Cement Coarse sand 20 mm Aggregate 10 mm Aggregate c) Equipment Concrete mixer Generator d) Form Work @ 3.75 per cent of (a+b+c)	day day tonne cum cum cum hour hour	3.00 20.00 6.05 6.75 8.10 5.40 6.00 6.00
	(iii)	RCC Grade M 30 <i>Unit = cum (For 15 cum)</i> b) Labour Skilled (Mason) Unskilled	day day	3.00 20.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
17.4	(iv)	a) Material			
		Cement	tonne	6.10	
		Coarse sand	cum	6.75	
		20 mm Aggregate	cum	8.10	
		10 mm Aggregate	cum	5.40	
		c) Equipment			
		Concrete mixer	hour	6.00	
		Generator	hour	6.00	
		d) Form Work @ 3. 50 per cent of (a+b+c)			
	A	(i)	RCC Grade M 35		
			<i>Unit = cum (For 15 cum)</i>		
			a) Labour		
			Skilled (Mason)	day	3.00
			Unskilled	day	20.00
			b) Material		
			Cement	tonne	6.33
			Coarse sand	cum	6.75
			20 mm Aggregate	cum	8.10
10 mm Aggregate	cum	5.40			
c) Equipment					
Concrete mixer	hour	6.00			
Generator	hour	6.00			
d) Form Work @ 3. 0 per cent of (a+b+c)					
(ii)	(ii)	Providing accessories and Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types soil/rock of strata complete as per Drawing and Technical specifications.			
		<i>Unit = meter. (For 1 m.)</i>			
		Diameter of well - 6 m.			
		Sandy Soil			
		Depth below bed level upto 3.0 M			
		a) Labour			
		Skilled (Sinker)	day	1.50	
		semi-skilled (Sinking helper)	day	2.00	
		b) Equipment			
crane with grab bucket	hour	6.00			
Consumables in sinking @10 per cent of (b)					
Beyond 3 m upto 10 m depth					
a) Labour					
Skilled (Sinker)	day	2.00			
semi-skilled (Sinking helper)	day	3.00			
b) Equipment					
crane with grab bucket	hour	6.00			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Consumables in sinking @10 per cent of (b)		
(iii) a		Beyond 10 m upto 20 m Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
(iv) a		Beyond 20 m upto 30 m Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		
B		Clayey Soil (6 m dia. Well) <i>Unit = meter. (For 1 m.)</i>		
(i)		Depth below bed level upto 3.0 m		
		a) Labour Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper)	day	3.00
		b) Equipment crane with grab bucket	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(ii)		Beyond 3 m upto 10 m depth		
		a) Labour Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper)	day	5.00
		b) Equipment crane with grab bucket	hour	6.00
		Air compressor with pneumatic chisel .	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(iii) a		Beyond 10 m upto 20 m Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add for dewatering @ 5 per cent of cost, if required.		
(iv) a		Beyond 20 m upto 30 m Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering of the cost, if required		
c		Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
C		Soft Rock (6 m dia well) <i>Unit = meter. (For 1 m.)</i>		
		a) Labour Skilled (Sinker)	day	4.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
17.5	D	Semi-skilled (Sinking helper)	day	24.00
		Diver	day	1.00
		b) Equipment		
		crane with grab bucket	hour	6.00
		Air compressor with pneumatic breakers	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
		Add for dewatering @ of 5 per cent of (a+b), if required		
		Hard Rock (6 m dia well)		
		<i>Unit = meter (For 1 m)</i>		
		a) Labour		
		Driller	day	4.00
		Blaster	day	1.00
		Unskilled	day	12.00
		Skilled	day	5.00
		b) Material		
		Gelatin 80 per cent	Kg	4.00
		Electric Detonators	nos	18.00
		c) Equipment		
		crane with grab bucket	hour	6.00
		compressor with pneumatic breaker/Jack hammer	hour	6.00
		Dewatering @ 5 per cent of cost of (a+c), if required.		
		Consumables in sinking @ 10 per cent of cost of (b).		
	Remarks:	Depth of sinking is reckoned from bed level.		
		Add cost related to security personnel for handling of explosive		
		Providing accessories and Sinking of 7 m external diameter well (other than pneumatic method of sinking) through all types soil/rock of strata complete as per Drawing and Technical specifications.		
		<i>Unit = meter (For 1 m.)</i>		
		Diameter of well - 7 m.		
	A	Sandy Soil		
	(i)	Depth below bed level upto 3.0 M		
		a) Labour		
		Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper)	day	3.00
		b) Equipment		
		crane with grab bucket	hour	6.00
		Consumables in sinking @10 per cent of (b)		
	(ii)	Beyond 3 m upto 10 m depth		
		a) Labour		
		Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper)	day	3.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		b) Equipment crane with grab bucket Consumables in sinking @10 per cent of (b)	hour	6.00
(iii)	a	Beyond 10 m upto 20 m Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
(iv)	a	Beyond 20 m upto 30 m Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
(v)	a	Beyond 30 m upto 40 m Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	b	Add 5 per cent of cost for dewatering, if required		
	c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
	B	Clayey Soil (7 m dia. Well) <i>Unit = meter (For 1 m)</i>		
(I)		Depth below bed level upto 3.0 M		
	a)	Labour Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper)	day	3.00
	b)	Equipment crane with grab bucket Consumables in sinking @ 10 per cent of (b)	hour	6.00
(ii)		Beyond 3 m upto 10 m depth		
	a)	Labour Skilled (Sinker)	day	2.50
		Semi-skilled (Sinking helper)	day	4.00
	b)	Equipment crane with grab bucket Air compressor with pneumatic chisel attachment Consumables in sinking @ 10 per cent of (b)	hour	6.00
			hour	6.00
(iii)	a	Beyond 10 m upto 20 m Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	b	Add for dewatering @ 5 per cent of cost, if required.		
(iv)		Beyond 20 m upto 30 m		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
a		Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering on the cost, if required		
c		Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour.		
(v)		Beyond 30 m upto 40 m		
a		Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering, if required		
c		Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
C		Soft Rock (7 m dia well) <i>Unit = meter. (For 1 m.)</i> Depth in soft rock strata upto 3 m		
		a) Labour		
		Skilled (Sinker)	day	5.00
		Semi-skilled (Sinking helper)	day	10.00
		Diver	day	1.00
		b) Equipment		
		crane with grab bucket	hour	6.00
		Air compressor with pneumatic breakers	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
		Add for dewatering @ of 5 per cent of (a+b), if required		
D		Hard Rock (7 m dia well) <i>Unit = meter (For 1 m.)</i> Depth in Hard rock strata up to 3 m		
		a) Labour		
		Skilled (Sinker)	day	6.00
		Driller	day	2.00
		Blaster	day	0.25
		Unskilled	day	18.00
		Diver	day	10.50
		b) Material		
		Gelatin	Kg	7.00
		Electric Detonators	nos	30.00
		c) Equipment		
		crane with grab bucket	hour	6.00
		compressor with pneumatic breaker/Jack hammer	hour	6.00
		Dewatering @ 5 per cent of cost of (a+c), if required.		
		Consumables in sinking @ 10 per cent of cost of (b).		
	Remarks:	Depth of sinking is reckoned from bed level.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
17.6	A	1705	Add cost related to security personnel for handling of explosive		
			Providing accessories and Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types soil/rock of strata complete as per Drawing and Technical specifications.		
			<i>Unit = meter (For 1 m.)</i>		
			Diameter of well - 8 m.		
			Sandy Soil		
			Depth below bed level upto 3.0 M		
			a) Labour		
			Skilled (Sinker)	day	2.00
			Semi-skilled (Sinking helper)	day	3.00
			b) Equipment		
			crane with grab bucket	hour	6.00
			Consumables in sinking @10 per cent of (b)		
			(ii)		
Beyond 3 m upto 10 m depth					
a) Labour					
Skilled (Sinker)	day	3.00			
Semi-skilled (Sinking helper)	day	4.00			
b) Equipment					
crane with grab bucket	hour	6.00			
Consumables in sinking @10 per cent of (b)					
(iii)					
a					
Beyond 10 m upto 20 m					
Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
(iv)					
a					
Beyond 20 m upto 30 m					
Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
b					
Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.					
(v)					
a					
Beyond 30 m upto 40 m					
Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
b					
Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
B					
(i)					
Clayey Soil (8 m dia. Well)					
<i>Unit = meter (For 1 m.)</i>					
Depth from bed level upto 3.0 M					
a) Labour					
Skilled (Sinker)	day	3.00			
Semi-skilled (Sinking helper)	day	4.00			
b) Equipment					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Crane with grab bucket Consumables in sinking @ 10 per cent of (b)		8.00
(ii)		Beyond 3 m upto 10 m depth		
		a) Labour		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper)	day	6.00
		b) Equipment		
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(iii)		Beyond 10 m upto 20 m		
a		Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add for dewatering @ 5 per cent of cost, if required.		
(iv)		Beyond 20 m upto 30 m		
a		Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering on the cost, if required		
c		Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
(v)		Beyond upto 40 m		
a		Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering, if required		
c		Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
C		Soft Rock (8 m dia well) <i>Unit = meter (For 1 m.)</i> Depth in soft rock strata upto 3 m		
		a) Labour		
		Skilled (Sinker)	day	5.00
		Semi-skilled (Sinking helper)	day	12.00
		Diver	day	1.00
		b) Equipment		
		crane with grab bucket	hour	6.00
		Air compressor with pneumatic breakers	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
		Add for dewatering @ of 5 per cent of (a+b), if required		
D		Hard Rock (dia well)		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
17.7	1705	<p><i>Unit = meter (For 1 m.)</i></p> <p>Depth in hard rock strata upto 3 m</p> <p>a) Labour</p> <p>Skilled day 6.00</p> <p>Driller day 3.00</p> <p>Blaster day 1.00</p> <p>Unskilled day 20.00</p> <p>b) Material</p> <p>Gelatin Kg 8.00</p> <p>Electric Detonators Nos 32.00</p> <p>c) Equipment</p> <p>crane with grab bucket hour 6.00</p> <p>compressor with pneumatic breaker/Jack hammer hour 6.00</p> <p>Dewatering @ 5 per cent of cost of (a+c), if required.</p> <p>Consumables in sinking @ 10 per cent of cost of (b).</p>		
		<p>Remarks:</p> <p>Depth of sinking is reckoned from bed level.</p> <p>Add cost related to security personnel for handling of explosive</p>		
		<p>Providing accessories and Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types soil/rock of strata complete as per Drawing and Technical specifications.</p> <p><i>Unit = meter (For 1 m.)</i></p> <p>Diameter of well - 10 m.</p> <p>Sandy Soil</p> <p>Depth below bed level upto 3.0 M</p> <p>a) Labour</p> <p>Skilled (Sinker) day 2.00</p> <p>Semi-skilled (Sinking helper) day 5.00</p> <p>b) Equipment</p> <p>crane with grab bucket hour 6.00</p> <p>Consumables in sinking @10 per cent of (b)</p>		
	(i)			
	(ii)	<p>Beyond 3 m upto 10 m depth</p> <p>a) Labour</p> <p>Skilled (Sinker) day 3.00</p> <p>Semi-skilled (Sinking helper) day 6.00</p> <p>b) Equipment</p> <p>crane with grab bucket hour 6.00</p> <p>Consumables in sinking @10 per cent of (b)</p>		
	(iii)	<p>Beyond 10 m upto 20 m</p> <p>Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter</p>		
	a			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
(iv) a		Beyond 20 m upto 30 m Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		
(v) a		Beyond 30 m upto 40 m Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		
B		Clayey Soil (dia. Well) <i>Unit = meter (For 1 m.)</i>		
(i)		Depth below bed level upto 3.0 M		
a)		Labour		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper)	day	6.00
b)		Equipment		
		crane with grab bucket	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(ii)		Beyond 3 m upto 10 m depth		
a)		Labour		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper)	day	6.00
b)		Equipment		
		crane with grab bucket	hour	6.00
		Air compressor with pneumatic chisel	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(iii) a		Beyond 10 m upto 20 m Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add for dewatering @ 5 per cent of cost, if required.		
(iv) a		Beyond 20 m upto 30 m Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering on the cost, if required		
c		Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).		
(v) a		Beyond 30 m upto 40 m Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
b		Add 5 per cent of cost for dewatering, if required		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	c		Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		
	C		<p>Soft Rock (dia well) <i>Unit = meter. (For 1 m)</i> Depth in soft rock strata upto</p> <p>a) Labour Skilled (Sinker) day 6.00 Semi-skilled (Sinking helper) day 20.00 Diver day 2.00</p> <p>b) Equipment crane with grab bucket hour 12.00 Air compressor with pneumatic breakers hour 12.00 Consumables in sinking @ 10 per cent of (b) Add for dewatering @ 5 per cent of cost, if required</p>		
	D		<p>Hard Rock (dia well) <i>Unit = meter. (For 1 m.)</i> Depth in hard rock strata upto 3 m</p> <p>a) Labour Skilled day 6.00 Driller day 2.00 Blaster day 2.00 Unskilled day 32.00</p> <p>b) Material Gelatin Kg 11.00 Electric Detonators Nos 44.00</p> <p>c) Equipment crane with grab bucket hour 12.00 compressor with pneumatic breaker/Jack hammer hour 12.00 Dewatering @ 5 per cent of cost (a+c), if required. Consumables in sinking @ 10 per cent of cost of (a+c).</p>		
		Remarks:	Depth of sinking is reckoned from bed level. Add cost related to security personnel for handling of explosive		
17.8		1705	<p>Providing accessories and Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types soil/rock of strata complete as per Drawing and Technical specifications.</p> <p><i>Unit = meter (For 0.25 m)</i> Diameter of well - 12 m. Sandy Soil I) Depth below bed level upto 3.0 M</p> <p>a) Labour</p>		
	A (i)				

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper)	day	4.00
		b) Equipment		
		crane with grab bucket	hour	6.00
		Consumables in sinking @10 per cent of (b)		
	(ii)	Beyond 3 m upto 10 m depth		
		a) Labour		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper)	day	6.00
		b) Equipment		
		crane with grab bucket	hour	12.00
		Consumables in sinking @10 per cent of (b)		
	(iii)	Beyond 10 m upto 20 m		
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	(iv)	Beyond 20 m upto 30 m		
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		
	B	Clayey Soil (12 m dia. Well)		
		<i>Unit = meter (For 0.25 m.)</i>		
	(i)	Depth below bed level upto 3.0 M		
		a) Labour		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper)	day	8.00
		b) Equipment		
		crane with grab bucket	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
	(ii)	Beyond 3 m upto 10 m depth		
		a) Labour		
		Skilled (Sinker)	day	6.00
		Semi-skilled (Sinking helper)	day	9.00
		b) Equipment		
		crane with grab bucket	hour	12.00
		Air compressor with pneumatic chisel	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
	(iii)	Beyond 10 m upto 20 m		
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
17.9	b	1705	Add for dewatering @ 5 per cent of cost, if required.			
	(iv)		Beyond 20 m upto 30 m			
	a		Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter			
	b		Add 5 per cent of cost for dewatering on the cost, if required			
	c		Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			
	Remarks:		Depth of sinking is reckoned from bed level. Add cost related to security personnel for handling of explosive			
			Providing accessories and Sinking of Twin D type well (other than pneumatic method of sinking) through all types soil/rock of strata complete as per Drawing and Technical specifications. Unit = meter (For 1 m.)			
	A		Sandy Soil			
	(i)		Depth from bed level upto 3.0 m			
			a) Labour			
			Skilled (Sinker)		day	2.00
			Semi-skilled (Sinking helper)		day	4.00
			b) Equipment			
			crane with grab bucket		hour	6.00
			Consumables in sinking @10 per cent of (b)			
	(ii)		Beyond 3 m upto 10 m depth			
			a) Labour			
	Skilled (Sinker)		day	3.00		
	Semi-skilled (Sinking helper)		day	6.00		
	b) Equipment					
	crane with grab bucket		hour	6.00		
	Consumables in sinking @10 per cent of (b)					
(iii)	Beyond 10 m upto 20 m					
a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
(iv)	Beyond 20 m upto 30 m					
a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.					
(v)	Beyond 30 m upto 40 m					
a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
B		Clayey Soil (Twin D Type Well) <i>Unit = meter (For 1 m.)</i> <i>Taking output = 1 meter</i>		
		(i) Depth below bed level upto 3.0 m		
		a) Labour		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper)	day	10.00
		b) Equipment		
		crane with grab bucket	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
		(ii) Beyond 3 m upto 10 m depth		
		a) Labour		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper)	day	12.00
b) Equipment				
crane with grab bucket	hour	12.00		
Air compressor with pneumatic chisel	hour	12.00		
Consumables in sinking @ 10 per cent of (b)				
(iii) Beyond 10 m upto 20 m				
a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter			
b	Add for dewatering @ 5 per cent of cost, if required.			
(iv) Beyond 20 m upto 30 m				
a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter			
b	Add 5 per cent of cost for dewatering on the cost, if required			
c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour).			
C		Soft Rock (Twin D Type Well) <i>Unit = meter (For 1 m.)</i> <i>Taking output = 1 m</i>		
		Depth in soft rock strata upto 20 m		
		a) Labour		
		Skilled (Sinker)	day	6.00
		Semi-skilled (Sinking helper)	day	18.00
		Diver	day	2.00
		b) Equipment		
		crane with grab bucket	hour	12.00
		Air compressor with pneumatic breakers	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
		Add for dewatering @ 5 per cent, if required		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
17.10	1207	<p>Providing and Filling sand in Wells complete as per Drawing and Technical Specifications. <i>Unit = cum (For 10 cum)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Sand (assuming 20 per cent voids)</p>	<p>day day cum</p>	<p>1.00 4.00 12.00</p>
17.11	1703	<p>Providing Steel Liner 10 mm thick for Curbs and 6 mm thick for Steining of Wells including Fabricating and Setting out as per Drawing and Technical Specifications. <i>Unit = tonne (For 1 tonne)</i></p> <p>a) Labour Skilled (Fitter+Blacksmith +Welder) Unskilled Electrodes, cutting gas and other consumables @ 5 per cent on cost (a) above.</p> <p>b) Material i) Structural steel</p>	<p>day day tonne</p>	<p>20.00 20.00 1.05</p>

SECTION 1800 - FALSEWORK, FORMWORK AND SURFACE FINISH FOR CONCRETE STRUCTURES

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
18.1	a	1804, 1805	<p>Note: This Section is applicable only when form work is specified as measurable and specified percentage of cost of concrete for formwork is not added in rate analysis of concrete (Section 2000)</p> <p>Providing , Preparing and Installing form work including necessary supports and removing after completion for foundation and footings. (Class F1 Finish)</p> <p>Using timber (soft wood) Unit =sqm (For 10 sqm)</p> <p>a) Labour Skilled day 1.5 Unskilled day 2</p> <p>b) Material Planks 38 mm thick. cum 0.42 struts, ballies, etc. cum 0.18 Nails, spikes, etc. kg 1</p>		
			b	<p>Using steel Unit =sqm (For 10 sqm)</p> <p>a) Labour Skilled day 1.5 Unskilled day 2.5</p> <p>b) Material MS sheet 14 gauge & angle stiffners kg 530 MS pipes dia. 40 mm m 36 Clamps nos 21 Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos) nos 178</p>	
		Remarks:	<p>1 Planks 38 mm thick 8 times usage.</p> <p>2 struts, ballies, etc. 12 times usage</p> <p>3 MS sheet 14 gauge & angle stiffners 60 times usage</p> <p>4 MS pipes 90 times usage</p> <p>5 Clamps 60 times usage</p> <p>6 Nuts & bolts 40 times usage</p>		
18.2	a	1804, 1805	<p>Providing , Preparing and Installing form work including necessary supports and removing after completion for walls. (Class F2 Finish), vertical plain surface</p> <p>Using timber (soft wood) Unit =sqm (For 10 sqm)</p> <p>Height upto 3 m</p> <p>a) Labour Skilled day 2.2 Unskilled day 2.2</p> <p>b) Material Ply wood 9 mm thick. sqm 11 struts, ballies, etc. cum 0.4</p>		
			i		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Nails, spikes, etc.	kg	2.5
	ii	Height above 3 m to 6 m a) Labour Skilled Unskilled b) Material Ply wood 9 mm thick. struts, ballies, etc. Nails, spikes, etc.	day day sqm cum kg	2.6 2.8 11 0.5 3.5
	iii	Height above 6 m to 9 m a) Labour Skilled Unskilled b) Material Ply wood 9 mm thick. struts, ballies, etc. Nails, spikes, etc.	day day sqm cum kg	3.2 4 11 0.6 4.5
	iv	Height above 9 m Increase the rate by 10 % for every additional meter height to the rate for previous height		
	b	Using steel Unit = sqm (For 10 sqm)		
	i	Height upto a) Labour Skilled Unskilled b) Material MS sheet 14 gauge & angle stiffeners MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day kg m nos nos	1.6 2.2 530 70 40 178
	ii	Height above 3 m to 6 m a) Labour Skilled Unskilled b) Material MS sheet 14 gauge & angle stiffeners MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day kg m nos nos	1.9 2.8 530 88 50 178

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
18.3	iii	Height above 6 m to 9 m a) Labour Skilled Unskilled b) Material MS sheet 14 gauge & angle stiffeners MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day kg m nos nos	2.3 4 530 112 64 178	
	iv	Height above 9 m Increase the rate by 10 % for every additional meter height to the rate for previous height			
	Remarks:				
	1	Planks 38 mm thick 8 times usage.			
	2	struts, ballies, etc. 12 times usage			
	3	MS sheet 14 gauge & angle stiffeners 60 times usage			
	4	MS pipes 90 times usage			
	5	Clamps 60 times usage			
	6	Nuts & bolts 40 times usage			
	1804, 1805	Providing , Preparing and Installing form work including necessary supports and removing after completion for walls. Class F2 Finish Vertical curve surface Using timber Unit =sqm (For 10 sqm)			
a	Height upto 3 m a) Labour Skilled Unskilled b) Material Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	3 3 11 0.6 4		
i	Height above 3m to 6 m a) Labour Skilled Unskilled b) Material Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	3.5 3.8 11 0.72 5		
ii	Height above 6 m to 9 m a) Labour				
iii					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity		
iv	b	Skilled	day	4.3		
		Unskilled	day	5.4		
		b) Material				
		Ply wood 9 mm thick.	sqm	11		
		Timber	cum	0.9		
		Nails, spikes, etc.	kg	6		
		Height above 9 m				
		Increase the rate by 10 % for every additional meter height to the rate for previous height				
		Using steel				
		Unit =sqm (For 10 sqm)				
		Height upto 3 m				
		ii	i	a) Labour		
Skilled	day			2		
Unskilled	day			3		
b) Material						
MS sheet 14 gauge & angle stiffeners	kg			530		
MS pipes dia. 40 mm	m			105		
Clamps	nos			60		
Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos			178		
Height above 3 m to 6 m						
a) Labour						
Skilled	day			2.4		
Unskilled	day			3.8		
b) Material						
MS sheet 14 gauge & angle stiffeners	kg	530				
MS pipes dia. 40 mm	m	126				
Clamps	nos	72				
Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178				
iii		Height above 6 m to 9 m				
		a) Labour				
		Skilled	day	3		
		Unskilled	day	5.4		
		b) Material				
		MS sheet 14 gauge & angle stiffeners	kg	530		
		MS pipes dia. 40 mm	m	160		
		Clamps	nos	91		
		Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178		
		iv		Height more than above 9 m		
				Increase the rate by 10 % for every additional meter height to the rate for previous height		
				Remarks:		
a	Walls with batter slope : Multiply the rates determined for vertical walls by 1.1					
b	For Class F1 Finish: Multiply the rates determined for Class F2 finish by 0.75					
c	For Class F3 Finish: Multiply the rates determined for Class F2 finish by 1.25					
1	Planks/ ply wood 8 times usage.					
2	struts, ballies, etc. 12 times usage					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity		
18.4	a	1804, 1805	3 MS sheet 14 gauge & angle stiffners 60 times usage				
			4 MS pipes 90 times usage				
			5 Clamps 60 times usage				
			6 Nuts & bolts 40 times usage				
			Providing , Preparing and Installing form work including necessary supports and removing after completion for columns				
			Class F3 Finish				
			Square / Rectangular surface				
			Using timber				
			Unit =sqm (For 10 sqm)				
			Height upto 3 m				
			a) Labour				
			Skilled			day	2.75
Unskilled			day	2.4			
b) Material							
Ply wood 9 mm thick.			sqm	11			
Timber			cum	0.5			
Nails, spikes, etc.			kg	3			
Height above 3 m to 6 m							
a) Labour							
Skilled			day	3.2			
Unskilled			day	3.2			
b) Material							
Ply wood 9 mm thick.			sqm	11			
Timber			cum	0.6			
Nails, spikes, etc.			kg	4			
Height above 6 m to 9 m							
a) Labour							
Skilled			day	4			
Unskilled			day	4.4			
b) Material							
Ply wood 9 mm thick.			sqm	11			
Timber			cum	0.75			
Nails, spikes, etc.			kg	5			
Height above 9 m							
Increase the rate by 10 % for every additional meter height to the rate for previous height							
Using steel							
Unit =sqm (For 10 sqm)							
Height upto 3 m							
a) Labour							
Skilled			day	2			
Unskilled			day	2.4			
b) Material							
MS sheet 14 gauge & angle stiffners			kg	530			
MS pipes dia. 40 mm			m	90			
Clamps			nos	51			
Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)			nos	178			
Height above 3 m to 6 m							

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
18.5	1804, 1805	a) Labour Skilled Unskilled b) Material MS sheet 14 gauge & angle stiffeners MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day kg m nos nos	2.3 3.1 530 108 62 178
		Height above 6 m to 9 m a) Labour Skilled Unskilled b) Material MS sheet 14 gauge & angle stiffeners MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day kg m nos nos	2.9 4.4 530 137 78 178
		Height above 9 m Increase the rate by 10 % for every additional meter height to the rate for previous height		
		Remarks: 1 Planks/ ply wood 6 times usage. 2 struts, ballies, etc. 12 times usage 3 MS sheet 14 gauge & angle stiffeners 50 times usage 4 MS pipes 90 times usage 5 Clamps 50 times usage 6 Nuts & bolts 35 times usage		
		Providing , Preparing and Installing form work including necessary supports and removing after completion for columns Class F3 Finish Circular surface Using timber Unit =sqm (For 10 sqm) Height upto 3 m		
		a) Labour Skilled Unskilled b) Material Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	3.6 3.3 11 0.75 5
		Height above 3 m to 6 m a) Labour Skilled Unskilled b) Material Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	4.2 4.2 11 1 6.5
		iii		
		iv		
		i		
		ii		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity			
iii		Height above 6 m to 9 m					
		a) Labour					
		Skilled	day	5.2			
		Unskilled	day	5.9			
		b) Material					
		Ply wood 9 mm thick.	sqm	11			
		Timber	cum	1.2			
		Nails, spikes, etc.	kg	8			
		iv		Height above 9 m			
				Increase the rate by 10 % for every additional meter height to the rate for previous height			
				Using steel			
				Unit =sqm (for 10 sqm)			
b				Height upto 3 m			
				i	a) Labour		
					Skilled	day	2.4
					Unskilled	day	3.3
					b) Material		
					MS sheet 14 gauge & angle stiffners	kg	530
					MS pipes dia. 40 mm	m	135
					Clamps	nos	77
		Nuts & bolts 6mm dia. (@approx. 2 kg per 100 nos)	nos		178		
		ii			Height above 3 m to 6 m		
					a) Labour		
					Skilled	day	2.9
Unskilled	day				4.2		
b) Material							
MS sheet 14 gauge & angle stiffners	kg			530			
MS pipes dia. 40 mm	m			162			
Clamps	nos			93			
Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos			178			
iii				Height above 6 m to 9 m			
				a) Labour			
				Skilled	day	3.6	
		Unskilled	day	2.9			
		b) Material					
		MS sheet 14 gauge & angle stiffners	kg	530			
		MS pipes dia. 40 mm	m	206			
		Clamps	nos	118			
		Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178			
		iv		Height above 9 m			
				Increase the rate by 10 % for every additional meter height to the rate for previous height			
				Remarks:		a	Inclined column: Multiply the rates for vertical columns as determined above by 1.1
1	Planks/ ply wood 6 times usage.						
2	struts, ballies, etc. 12 times usage						
3	MS sheet 14 gauge & angle stiffners 50 times usage						
4	MS pipes 90 times usage						

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity			
18.6	a	5	Clamps 50 times usage					
		6	Nuts & bolts 35 times usage					
		1804, 1805	Providing , Preparing and Installing form work including necessary supports and removing after completion for slab structure. Class F2 Finish False work not included Using timber Unit =sqm (For 10 sqm)					
		a) Labour						
		Skilled	day	1.8				
		Unskilled	day	2.5				
		b) Material						
		Planks 38 mm thick. & rafters, beam, battens etc.	cum	0.54				
		Nails, spikes, etc.	kg	2.5				
		b	b		Using steel Unit =sqm (For 10 sqm)			
a) Labour								
Skilled	day			1.25				
Unskilled	day			2.5				
b) Material								
MS sheet 14 gauge & angle stiffners	kg			530				
Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos			178				
c	c				Using shuttering Ply Unit =sqm (For 10 sqm)			
				a) Labour				
				Skilled	day	1.5		
		Unskilled	day	2.5				
		b) Material						
		Ply wood 12 mm thick.	sqm	11				
		Rafter, beam, battens etc.	cum	0.1				
		Nails, spikes, etc.	kg	2				
		18.7	a	1804, 1805	Providing , Preparing and Installing form work including necessary supports and removing after completion for slab & beam structure. Class F2 Finish False work not included Using timber Unit =sqm (For 10 sqm)			
						a) Labour		
Skilled	day					3		
Unskilled	day					3		
b) Material								
Planks 38 mm thick. & rafters, beam, battens etc.	cum					0.82		
Remarks:								
1	Planks/ ply wood 6 times usage.							
2	struts, ballies, etc. 8 times usage							
3	MS sheet 14 gauge & angle stiffners 40 times usage							
4	Nuts & bolts 35 times usage							

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
18.8	1804, 1805	Nails, spikes, etc.	kg	4	
		b	Using steel Unit =sqm (For 10 sqm)		
		a) Labour			
		Skilled	day	2	
		Unskilled	day	3	
		b) Material			
		MS sheet 14 gauge & angle stiffeners	kg	530	
		MS pipes dia. 40 mm	m	32	
		Clamps	nos	18	
		Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178	
		c	Using shuttering Ply Unit =sqm (For 10 sqm)		
		a) Labour			
Skilled	day	2.5			
Unskilled	day	3			
b) Material					
Ply wood 12 mm thick.	sqm	11			
Rafter, strut, battens etc.	cum	0.32			
Nails, spikes, etc.	kg	3			
Remarks:					
	1	Planks/ ply wood 6 times usage.			
	2	struts, ballies, etc. 8 times usage			
	3	MS sheet 14 gauge & angle stiffeners 40 times usage			
	4	MS pipes 60 times usage			
	5	Clamps 40 times usage			
	6	Nuts & bolts 30 times usage			
		Providing , Preparing and Installing form work including necessary supports and removing after completion for arch structure.			
		Class F2 Finish			
		False work not included			
	a	Using timber Unit =sqm (For 10 sqm)			
	a) Labour				
	Skilled	day	3.5		
	Unskilled	day	3		
	b) Material				
	Ply wood 12 mm thick.	sqm	11		
	Rafters, beam, battens etc.	cum	0.3		
	Nails, spikes, etc.	kg	4		
	b	Using steel Unit =sqm (For 10 sqm)			
	a) Labour				
	Skilled	day	2.5		
	Unskilled	day	3		
	b) Material				
	MS sheet 14 gauge & angle stiffeners	kg	530		
	MS pipes dia. 40 mm	m	32		
	Clamps	nos	18		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
18.9	1804, 1805	Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178
		Remarks:		
		1 Planks/ ply wood 6 times usage.		
		2 struts, ballies, etc. 8 times usage		
		3 MS sheet 14 gauge & angle stiffners 40 times usage		
		4 MS pipes 60 times usage		
		5 Clamps 40 times usage		
		6 Nuts & bolts 30 times usage		
		Providing , Preparing and Installing form work including necessary supports and removing after completion for precast element.		
		Class F3 Finish		
		Square / Rectangular section		
		Using timber		
Unit =sqm (For 10 sqm)				
a) Labour				
Skilled	day	2.5		
Unskilled	day	2		
b) Material				
Ply wood 9 mm thick.	sqm	11		
Timber	cum	0.2		
Nails, spikes, etc.	kg	2		
b				
Using steel				
Unit =sqm (For 10 sqm)				
a) Labour				
Skilled	day	2		
Unskilled	day	2		
b) Material				
MS sheet 14 gauge & angle stiffners	kg	530		
MS pipes dia. 40 mm	m	32		
Clamps	nos	18		
Nuts & bolts dia. (@approx. 2 kg per 100 nos)	nos	178		
II				
a				
Circular section				
Using timber				
Unit =sqm (For 10 sqm)				
a) Labour				
Skilled	day	3		
Unskilled	day	2.5		
b) Material				
Ply wood 9 mm thick.	sqm	11		
Timber	cum	0.2		
Nails, spikes, etc.	kg	3		
b				
Using steel				
Unit =sqm (For 10 sqm)				
a) Labour				
Skilled	day	2.5		
Unskilled	day	2		
b) Material				
MS sheet 14 gauge & angle stiffners	kg	530		
MS pipes dia. 40 mm	m	42		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos nos	24 178
	II	Curved precast elements Multiply the rates for straight elements as determined above by 1.25		
	Remarks:	1 Planks/ ply wood 6 times usage. 2 struts, ballies, etc. 8 times usage 3 MS sheet 14 gauge & angle stiffeners 40 times usage 4 MS pipes 60 times usage 5 Clamps 40 times usage 6 Nuts & bolts 30 times usage		
18.10	1803	Providing and assembling in position falsework for the construction of RCC superstructure and removing after completion including design & drawings as per specification For Slab and Box culverts Using timber Unit = (10 sqm of form work)		
	a			
	i)	Height upto 2 m		
		a) Labour		
		Skilled	day	8
		Unskilled	day	8
		b) Material		
		Timber	cum	0.8
		Nails, spikes, etc.	kg	2.5
	ii)	Height above 2 m to 4 m		
		a) Labour		
		Skilled	day	16
		Unskilled	day	18
		b) Material		
		Timber	cum	1.4
		Nails, spikes, etc.	kg	4
	iii)	Height above 4 m to 6 m		
		a) Labour		
		Skilled	day	24
		Unskilled	day	28
		b) Material		
		Timber	cum	1.9
		Nails, spikes, etc.	kg	5.5
	iv)	For Height above 6 m , Increase the rate by 10% for every additional meter height to the rate for the previous height or Design as a special case and derive Norms		
	b	Using steel		
		Unit =sqm (For 10 sqm of form work)		
	i)	Height upto 2 m		
		a) Labour		
		Skilled	day	4
		Unskilled	day	6

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
18.11		b) Material MS pipes dia. 40 - 50 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	m nos nos	240 137 178
		ii) Height above 2 m to 4 m a) Labour Skilled Unskilled b) Material MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day m nos nos	8 14 42 24 178
		iii) Height above 4 m to 6 m a) Labour Skilled Unskilled b) Material MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day m nos nos	12 20 570 325 178
		iv) Height above 6 m, Increase the rate by 10% for every additional meter height to the rate for the previous height or Design as a special case and derive Norms		
		Remarks: a. Add 3% of total unit rate of false work for the design and drawings 1 Timber (struts, ballies, etc.) 8 times usage 2 MS sheet 14 gauge & angle stiffners 40 times usage 3 MS pipes 60 times usage 4 Clamps 40 times usage		
		1803 Providing and assembling in position falsework for the construction of RCC superstructure and removing after completion including design & drawings as per specification, for RCC Beam Bridge		
		a) Using timber Unit =sqm (For 10 sqm of form work)		
		i) Height upto 3 m a) Labour Skilled Unskilled b) Material Timber Nails, spikes, etc.	day day cum kg	14 14 2 6
		ii) Height above 3 m to 6 m a) Labour Skilled Unskilled b) Material Timber Nails, spikes, etc.	day day cum kg	28 32 4 12

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	iii)	Height above 6 m to 9 m a) Labour Skilled Unskilled b) Material Timber Nails, spikes, etc.	day day cum kg	40 50 7 21
	iv)	Height above 9 m Increase the rate by 10% for every additional meter height to the rate for the previous height or Design as a special case and derive Norms		
	b	Using steel		
		Unit =sqm (For 10 sqm of form work)		
	i)	Height upto 3 m a) Labour Skilled Unskilled b) Material MS pipes dia. 40 - 50 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day m nos nos	7 11 300 171 178
	ii)	Height above 3 m to 6m a) Labour Skilled Unskilled b) Material MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day m nos nos	14 25 600 342 178
	iii)	Height above 6 m to 9m a) Labour Skilled Unskilled b) Material MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	day day m nos nos	20 40 980 560 178
	iv)	Height above 9 m Increase the rate by 10% for every additional meter height to the rate for the previous height or Design as a special case and derive Norms		
	Remarks:	a. Add 3% of total unit rate of false work for the design and drawings		
		1 Timber (struts, ballies, etc.) 8 times usage		
		2 MS sheet 14 gauge & angle stiffners 40 times usage		
		3 MS pipes 60 times usage		
		4 Clamps 40 times usage		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
18.12		1803	Providing and assembling in position falsework for the construction of RCC superstructure and removing after completion including design & drawings as per specification, for RCC Arch Bridge		
	a		Using timber		
			Unit = sqm (For 10 sqm of form work)		
	i)		Height upto 3 m		
			a) Labour		
			Skilled	day	18
			Unskilled	day	16
			b) Material		
			Timber	cum	1.2
			Nails, spikes, etc.	kg	3.5
	ii)		Height above 3m to 6 m		
			a) Labour		
			Skilled	day	36
			Unskilled	day	36
			b) Material		
			Timber	cum	2.4
			Nails, spikes, etc.	kg	7
	iii)		Height above 6 m to 9 m		
			a) Labour		
			Skilled	day	50
			Unskilled	day	57
			b) Material		
			Timber	cum	4.2
			Nails, spikes, etc.	kg	12
	iv)		Height above 9 m Increase the rate by 10% for every additional meter height to the rate for the previous height or Design as a special case and derive Norms		
	b		Using steel		
			Unit = sqm (For 10 sqm of form work)		
	i)		Height upto 3 m		
			a) Labour		
			Skilled	day	8
			Unskilled	day	12
			b) Material		
			MS pipes dia. 40 - 50 mm	m	360
			Clamps	nos	205
			Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178
	ii)		Height above 3 m to 6 m		
			a) Labour		
			Skilled	day	16
			Unskilled	day	25
			b) Material		
			MS pipes dia. 40 mm	m	720
			Clamps	nos	410
			Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)	nos	178
	iii)		Height above 6 m to 9 m		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	iv)	<p>a) Labour Skilled Unskilled</p> <p>b) Material MS pipes dia. 40 mm Clamps Nuts & bolts 6 mm dia. (@approx. 2 kg per 100 nos)</p> <p>Height above 9 m Increase the rate by 10% for every additional meter height to the rate for the previous height or Design as a special case and derive Norms</p> <p>Remarks:</p> <p>a. Add 3% of total unit rate of false work for the design and drawings</p> <p>1 Timber (struts, ballies, etc.) 8 times usage 2 MS sheet 14 gauge & angle stiffners 40 times usage 3 MS pipes 60 times usage 4 Clamps 40 times usage</p> <p>Remarks for False Work:</p> <p>1) Norms for falseworks have been prepared for general topography where average height can be practically assessed. For typical topographical sites, like gorge, these norms may not be applicable. Separate norms specific to the site should be developed. 2) Generally, materials for form/false work shall not be mentioned in the contract documents/ bill of quantities. The materials may be timber, steel or their combinations as per contractors option, subject to the approval of the Engineer. 3) For the purpose of this rate analysis, the unit rate of form/false work materials shall be derived by dividing the prevailing rate of materials by number of times of usage mentioned in the Remarks (neglecting scrap value).</p>	day day m nos nos	25 46 1180 674 178

SECTION 1900 - BEARING AND EXPANSION JOINTS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
19.1	1902	<p>Supplying, fitting and fixing in position true to line and level cast steel rocker bearing including all accessories as per Drawing and Technical Specifications. Unit: tonne (For upto 250 tonne capacity bearing)</p> <p>a) Labour Skilled Unskilled</p> <p>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 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.</p>	day day nos	1.00 2.00 1.00
	Remarks:	Bearing shall have at least 250 tonne capacity, fore more than 250 tonne capacity add per tonne rate .		
19.2	1902	<p>Supplying, fitting and fixing in position true to line and level forged steel roller bearing including all accessories as per Drawing and Technical Specifications. Unit: tonne (for upto 250 tonne capacity)</p> <p>a) Labour Unskilled Skilled</p> <p>b) Material Forged steel roller bearing of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.</p>	day day nos.	1.00 1.00 1.00
	Remarks:	Bearing shall have at least 250 tonne capacity, fore more than 250 tonne capacity add per tonne rate .		
19.3	1902	<p>Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel including all accessories as per Drawing and Technical Specifications (BS: 5400, section 9.1 & 9.2 for PTFE). Unit: tonne (For upto 80 tonne capacity bearing)</p> <p>a) Labour Unskilled Skilled</p> <p>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</p>	day day nos	1.00 1.00 1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
19.4	1902	<p>Add 1 per cent for foundation anchorage bolts and consumables.</p> <p>Bearing shall have at least 80 tonne capacity, fore more than 80 tonne capacity add per tonne rate .</p> <p>Supplying, fitting and fixing in position true to line and level elastomeric bearing including all accessories as per Drawing and Technical Specifications.</p> <p>Unit: cubic centimeter (Considering an elastomeric bearing of size 500 x 400 x 96 mm .)</p> <p>Overall volume - 19200 cu.cm, Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm., Hence volume of elastomer = 14655 cu.cm.</p> <p>a) Labour</p> <p>Unskilled</p> <p>Skilled</p> <p>b) Material</p> <p>Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanization, complete with all components as per drawing and Technical Specifications.</p> <p>Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.</p>		
		<p>Remarks:</p>		
19.5	1902	<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 including all accessories as per Drawing and Technical Specifications.</p> <p>Unit: tonne (Considering a 80 tonne capacity bearing)</p> <p>a) Labour</p> <p>Unskilled</p> <p>Skilled</p> <p>b) Material</p> <p>Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.</p> <p>Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.</p>		
		<p>Remarks:</p> <p>Bearing shall have at least 80 tonne capacity, fore more than 80 tonne capacity add per tonne rate .</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
19.6	1902	<p>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 as per Drawing and Technical Specifications.</p> <p><i>Unit: tonne (For Considering a 250 tonne capacity bearing)</i></p> <p>a) Labour Unskilled Skilled</p> <p>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 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.</p>	day day nos	2.00 1.00 1.00
	Remarks:	Bearing shall have at least 250 tonne capacity, fore more than 250 tonne capacity add per tonne rate .		
19.7	1901	<p>Buried Joint Providing and laying a buried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanized weldable structural steel plate as per IS: 2062, placed symmetrical to center line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia. 100 mm long galvanized nails spaced 300 mm c/c along the center line of the plate as per Drawing and Specifications. <i>Unit = meter (For 12 m)</i></p> <p>a) Labour Unskilled Skilled</p> <p>b) Material Galvanized MS. plate 200 mm wide, 12 mm thick @ 94.20 kg/sqm including 5 per cent wastage Add 1 per cent of cost of steel plate cutting, welding consumables and galvanized nails.</p>	day day kg	1.00 1.00 237.50
19.8	1901	<p>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 Drawings and Technical specifications <i>Unit = meter (For 12 m)</i></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
19.9	1901	<p>a) Labour Unskilled Skilled</p> <p>b) Material Supply of elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to approved drawings and standard specification Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.</p> <p>Joint has to be installed by the manufacturer/supplier or their authorized representative ensuring compliance to the manufacturer's instructions for installation</p>	day day meter	1.00 1.00 12.00
		<p>Compression Seal Joint Providing and laying of compression seal joint consisting of steel armored 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 and vertical movement all complete as per Drawing and Technical Specifications. <i>Unit = meter (For 12 m)</i></p> <p>a) Labour Unskilled Skilled</p> <p>b) Material 1. Galvanized angle sections 100 mm x 100 mm of 12 mm thickness weldable structural steel a Add 5 per cent of cost of above for structural steel for anchorage, welding and other incidentals. Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanized in a single operation for the full length of a joint to ensure water tightness. Add 1 per cent of cost of sealing element for lubricant-cum-adhesive and other consumables.</p> <p>Remarks: 1. The installation shall be done by the manufacturer or his authorized 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. 4. modify weight of angle if designed angle is different than above</p>	day day kg meter	1.00 1.00 446.00 12.00
19.10	1901	<p>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 Technical specifications. <i>Unit = meter (For 12 m)</i></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
19.11	1901	<p>a) Labour Unskilled Skilled</p> <p>b) Material Supply of complete assembly of strip seal expansion joint comprising of edge beams, anchorage, strip seal element and complete accessories as per approved specifications and drawings. Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.</p>	day day meter	1.00 1.00 12.00
		<p>Remarks:</p> <p>1. The installation shall be done by the manufacturer or his authorized 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.</p> <p>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 140 mm, complete as per Drawings and Technical Specifications . <i>Unit = meter (For 12 m)</i></p> <p>a) Labour Unskilled Skilled</p> <p>b) Material Supply of a modular strip/box seal joint assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorized representative.</p>	day day meter	1.00 1.00 12.00
19.12	1901	<p>Modular Strip / Box Seal Joint Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140 mm and upto 210 mm, complete as per Drawings and Technical specifications. <i>Unit = Running meter (For 12 m)</i> <i>Taking output = 12 m</i></p> <p>a) Labour Unskilled Skilled</p> <p>b) Material</p>	day day	1.00 1.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			<p>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 authorized representative.</p> <p>Remarks:</p> <ol style="list-style-type: none"> 1. The installation shall be done by the manufacturer or his authorized 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. 	meter	12.00

SECTION 2000 - CONCRETE FOR STRUCTURES

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
20.1	2000	<p>Providing and laying of Plain Cement Concrete M 10 (or 1:3:6 for nominal mix) in Foundation complete as per Drawing and Technical Specifications. <i>Unit = cum (For 15 cum)</i></p> <p>a) Labour Skilled day 2 Unskilled day 22</p> <p>b) Material 40 mm Aggregate cum 13.5 coarse Sand cum 6.75 cement tonne 3.45 Cost of water KL 2</p> <p>c) Equipment Concrete mixer hour 6 Generator hour 6</p>		
	Remarks:	1. Vibrator is a part of minor T & P which shall be covered in overhead charges of the contractor. 2. In case of manual mixed concrete add 50 % of Labour component and reduce Equipment		
20.2	A	<p>Providing and laying of Plain/Reinforced Cement Concrete in Foundation complete as per Drawing and Technical Specifications. PCC Grade M 15 <i>Unit = cum (For 15 cum)</i></p> <p>a) Labour Skilled day 3 Unskilled day 30</p> <p>b) Material Cement tonne 4.13 Coarse sand cum 6.75 40 mm Aggregate cum 8.1 20 mm Aggregate cum 4.05 10 mm Aggregate cum 1.35 Cost of water KL 2</p> <p>c) Equipment Concrete mixer hour 6 Generator hour 6</p> <p>d) Formwork @ 4 per cent on cost of concrete i.e. cost of Material, Labour and Equipment</p>		
	Remarks:	1. In case of manual mixed concrete add 50 % of Labour component and reduce Equipment		
	B	PCC Grade M 20		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Unit : cum (For 15 cum)		
		a) Labour		
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	5.16
		Coarse sand	cum	6.75
		40 mm Aggregate	cum	5.4
		20 mm Aggregate	cum	5.4
		10 mm Aggregate	cum	2.7
		Cost of water	KL	2.5
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of Material, Labour and Equipment		
	C	RCC Grade M 20		
		Unit = cum (For 15 cum)		
		a) Labour		
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	5.21
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Cost of water	KL	2.5
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		d) Formwork @ 4 per cent on (a+b+c)		
	D	PCC Grade M 25		
		Unit = cum (For 15 cum)		
		a) Labour		
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	5.99
		Coarse sand	cum	6.75
		40 mm Aggregate	cum	5.4
		20 mm Aggregate	cum	5.4
		10 mm Aggregate	cum	2.7
		Cost of water	KL	3

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
E		Admixture @ 0.4 per cent of cement/ as per mix design		
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		d) Formwork @ 3.75 per cent of (a+b+c)		
		RCC Grade M 25		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	6.05
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
10 mm Aggregate	cum	5.4		
Cost of water	KL	3		
Admixture @ 0.4 per cent of cement/ as per mix design	kg			
c) Equipment				
Concrete mixer	hour	6		
Generator	hour	6		
d) Formwork @ 3.75 per cent of (a+b+c).				
F		PCC Grade M 30		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	6.08
		Coarse sand	cum	6.75
		40 mm Aggregate	cum	5.4
		20 mm Aggregate	cum	5.4
		10 mm Aggregate	cum	2.7
		Cost of water	KL	3
		Admixture @ 4 % weight of cement or as per mix design	kg	
		c) Equipment		
Concrete mixer	hour	6		
Generator	hour	6		
d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of Material, Labour and Equipment				
G		RCC Grade M30		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled Unskilled b) Material Cement Coarse sand 20 mm Aggregate 10 mm Aggregate Cost of water Admixture @ 0.4 per cent of cement/ as per mix design c) Equipment Concrete mixer Generator d) Formwork @ 3.5 per cent on cost of concrete i.e. cost of Material, Labour and Equipment	day day tonne cum cum cum KL kg hour hour	3 30 6.1 6.75 8.1 5.4 3 3 6 6
	H	RCC Grade M 35 <i>Unit = cum (For 15 cum)</i> a) Labour Skilled Unskilled b) Material Cement Coarse sand 20 mm Aggregate 10 mm Aggregate Cost of water Admixture @ 0.4 per cent of cement/ as per mix design c) Equipment Concrete mixer Generator d) Formwork @ 3 per cent on a+b+c	day day tonne cum cum cum cum KL kg hour hour	3 30 6.33 6.75 8.1 5.4 3 3 6 6
		Remarks: 1. Where ever concrete is carried out using batching plant Replace above Concrete mixture and put required hour of Batching plant with job efficiency 70 % to produce concrete. 2. Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixtures conforming IS: 9103 @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete. 3. Where ever concrete is prepared as per design mix , admixture confirming IS :9103, may be added to attain desired strength /desired slump of concrete 4. Cement provided for various components of the structure is for estimating purpose only. Actual quantity of cement , admixture etc. 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.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
20.3		2014	<p>Providing and laying , fitting and placing un-coated Mild steel / HYSD reinforcement complete in foundation as per drawing and technical specification <i>Unit = tonne (For 1 MT)</i></p> <p>a) Labour Skilled / Blacksmith Unskilled</p> <p>b) Material MS bars Binding wire</p>	day day tonne Kg	4 9 1.1 8
20.4		2000	<p>Providing and laying of Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications <i>Unit = cum (For 1 cum)</i></p> <p>A PCC Grade M 15 Height upto 5 m Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (A) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p> <p>B PCC Grade M20 Height upto 5 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (B) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p> <p>C (p) PCC Grade M 25 Height upto 5 m Basic Cost of Labour, Material & Equipment (a+b+c) of item 20.2(D) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p> <p>(q) Height above 5 m to 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (D) d) formwork Add 12 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 2 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p> <p>(r) Height above 10 m</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (D) d) formwork Add 15 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 4 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
D		<p>PCC Grade M 30 Height upto 5 m</p>		
(p)		<p>Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (F) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
(q)		<p>Height above 5 m to 10 m</p>		
		<p>Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (F) d) formwork Add 12 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 2 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
(r)		<p>Height above 10 m</p>		
		<p>Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (F) d) formwork Add 15 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 4 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
E		<p>RCC Grade M 20 Height upto 5 m</p>		
(p)		<p>Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (C) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
(q)		<p>Height above 5 m to 10 m</p>		
		<p>Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (C) d) formwork Add 12 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 2 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	(r)	<p>Height above 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (C) d) formwork Add 15 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 4 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
F	(p)	<p>RCC Grade M 25 Height upto 5 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (E) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
	(q)	<p>Height above 5 m to 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (E) d) formwork Add 12 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 2 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
	(r)	<p>Height above 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (E) d) formwork Add 15 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 4 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
G	(p)	<p>RCC Grade M 30 Height upto 5 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (G) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
	(q)	<p>Height above 5 m to 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (G) d) formwork Add 12 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 2 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	(r)	<p>Height above 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (G) Case d) formwork Add 15 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 4 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
	H (p)	<p>RCC Grade M 35 Height upto 5 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (H) d) formwork Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
	(q)	<p>Height above 5 m to 10 m Per Cum Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (H) d) formwork Add 12 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 2 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
	(r)	<p>Height above 10 m Basic Cost of Labour, Material & Equipment (a+b+c) of Item 20.2 (H) d) formwork Add 15 % of cost of Material, Labour and Equipment (a+b+c) for Formwork Add 4 % of cost of Material, Labour and Equipment excluding formwork to cater for extra lift</p>		
	Remarks:	<p>The basic components of this analysis (20.4) are the same as those of items 20.2 (A to H). The only changes are as under: a) Ramps/Stairs: Extra expenditure on structures which are more than 5 m high @ 2 per cent of cost for height upto 10 m and 4 per cent 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.</p>		
20.5	2014	<p>Providing and laying , fitting and placing HYSD bar reinforcement in sub-structure complete as per Drawing and Technical Specifications Unit= tonne (For 1 tonne) a) Labour for cutting, bending, shifting to site, tying and placing in position Skilled (Blacksmith)</p>	day	4

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
20.6	2014	Unskilled	day	9
		b) Material		
		HYSD bars	tonne	1.1
		Binding wire	kg	8
		Providing and laying ,fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification <i>Unit= tonne (For 1 tonne)</i>		
		a) Labour for straightening, cutting, bending, shifting to site, tying and placing in position		
		Skilled (Blacksmith)	day	4
		Unskilled	day	10
		b) Material		
		MS bars	tonne	1.15
		Binding wire	kg	9
20.7	3109	Providing and laying weep holes in Brick dry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 110 mm dia HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face Complete as per Drawing and Technical Specifications. <i>Unit = meter. (For 30 meter.)</i>		
		a) Labour		
		Skilled	day	1
		Unskilled	day	1
		b) Material		
		HDPE pipe 110 mm dia. Average length of weep hole is taken as one meter for the purpose of estimating.	meter	31.5
		MS clamp	nos.	30
		collar for AC pipe	nos.	10
		Cement mortar 1:3	tonne	0.0255
		sand	cum	0.0525
		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.		
		SUPER STRUCTURE		
20.8	2000	Providing and laying of Reinforced/ Pre-stressed cement concrete in super-structure as per drawing and Technical Specification RCC Grade M 20 <i>Unit = cum (For 15 cum)</i>		
		a) Labour		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	5.12
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Cost of water	KL	3
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		For formwork and staging add the following:		
(i)		For solid slab super-structure, 20-30 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 20 % of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % of (a+b+c)		
(ii)		For T-beam & slab, 25-35 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 35 % of (a+b+c)		
	B	RCC Grade M 25		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	3
		Unskilled	day	30
		b) Material		
		Cement	tonne	5.99

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Cost of water	KL	3
		Admixture @ 0.4 per cent of cement/ as per mix design	kg	
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		For formwork and staging add the following:		
(i)		For solid slab super-structure, 20-30 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 20 % of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % of (a+b+c)		
(ii)		For T-beam & slab, 25-35 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 35 % of (a+b+c)		
C		RCC Grade M 30		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	3
		Unskilled	day	32
		b) Material		
		Cement	tonne	6.1
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Cost of water	KL	3
		Admixture @ 0.4 per cent of cement/ as per mix design	kg	
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		For formwork and staging add the following:		
(i)		For solid slab super-structure, 20-30 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 20 % of (a+b+c)		
(q)		Height above 5m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		Formwork and staging 25 % of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % of (a+b+c)		
(ii)		For T-beam & slab, 25-35 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 35 % of (a+b+c)		
D		RCC/PSC Grade M 35		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	3
		Unskilled	day	32
		b) Material		
		Cement	tonne	6.33
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Cost of water	KL	3
		Admixture @ 0.4 per cent of cement/ as per mix design	kg	
		c) Equipment		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Concrete mixer	hour	6
		Generator	hour	6
(i)		For formwork and staging add the following:		
(p)		For solid slab super-structure, 18-28 per cent of (a+b+c)		
		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 18 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 23 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 28 % per cent of (a+b+c)		
(ii)		For T-beam & slab, 23-33 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 23 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 28 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 33 % per cent of (a+b+c)		
(iii)		For box girder and balanced cantilever, 38-58 per cent of cost of concrete.		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 38 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 48 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 58 % per cent of (a+b+c)		
E		PSC Grade M-40		
		<i>Unit = cum (For 15 cum)</i>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		a) Labour		
		Skilled	day	4
		Unskilled	day	33
		b) Material		
		Cement	tonne	6.45
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Admixture @ 0.4 per cent of cement/ as per mix design	kg	
		Cost of water	KL	3
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		For formwork and staging add the following:		
(i)		For solid slab super-structure, 20-30 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 20 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % per cent of (a+b+c)		
(ii)		For T-beam & slab, 25-35 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 35 % per cent of (a+b+c)		
F		PSC Grade M-45		
		Unit = cum (For 15 cum)		
		a) Labour		
		Skilled	day	4
		Unskilled	day	33

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		b) Material		
		Cement	tonne	6.975
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Admixture @ 0.4 per cent of cement / as per mix design	kg	
		Cost of water	KL	3
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		For formwork and staging add the following:		
(i)		For solid slab super-structure, 20-30 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 20 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum		
		d) Formwork and staging 30 % per cent of (a+b+c)		
(ii)		For T-beam & slab, 25-35 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 35 % per cent of (a+b+c)		
G		PSC Grade M-50		
		<i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	5
		Unskilled	day	30
		b) Material		
		Cement	tonne	7.35

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Coarse sand	cum	6.75
		20 mm Aggregate	cum	8.1
		10 mm Aggregate	cum	5.4
		Admixture @ 0.4 per cent of cement/ as per mix design	kg	
		Cost of water	KL	3
		c) Equipment		
		Concrete mixer	hour	6
		Generator	hour	6
		For formwork and staging add the following:		
(i)		For solid slab super-structure, 20-30 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 20 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % per cent of (a+b+c)		
(ii)		For T-beam & slab, 25-35 per cent of (a+b+c)		
(p)		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % per cent of (a+b+c)		
(q)		Height above 5 m to 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 30 % per cent of (a+b+c)		
(r)		Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum		
		d) Formwork and staging 35 % per cent of (a+b+c)		
	Remarks	1. Where ever concrete is carried out using batching plant Replace above Concrete mixture and put required hour of Batching plant with job efficiency 70 % to produce concrete. 2. Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixtures conforming IS: 9103 @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete. 3. Where ever concrete is prepared as per design mix , admixture conforming IS :9103, upto 4 percent of cement weight may be added to attain desired strength /desired slump of concrete		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
20.9	2014	<p>4. Cement provided for various components of the structure is for estimating purpose only. Actual quantity of cement , admixture etc. 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.</p> <p>Providing and laying , fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications <i>Unit = tonne (For 1 tonne)</i></p> <p>a) Labour for cutting, bending, tying and placing in position</p> <p>Skilled (Blacksmith) day 4 Unskilled day 12</p> <p>b) Material</p> <p>HYSD bars tonne 1.1 Binding wire Kg 8</p>		
20.10		<p>Providing and laying of PCC M 15 Grade leveling course below approach slab complete as per drawing and Technical specification <i>Unit = cum (For 1 cum)</i></p> <p>Material</p> <p>Concrete, Rate as per item No. 20.2 (A) excluding formworks cum 1</p>		
20.11	2014	<p>Providing and laying of Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification <i>Unit = cum (For 1 cum)</i></p> <p>a) Material</p> <p>Cement concrete Grade (excluding formwork i.e. per cum basic cost (a+b+c)) cum 1 (Refer relevant item of concrete in item except that form work may be added at the rate of 2 per cent of cost against 3.5 per cent provided in the foundation concrete. HYSD bar reinforcement Rate tonne 0.05</p>		
		Remarks:		
20.12	2000	<p>Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications <i>Unit = cum (For 1 cum)</i></p> <p>a) Labour</p> <p>Skilled day 2 Unskilled day 2</p> <p>b) Material</p> <p>Concrete, Rate as per item No. 20.2 (G) excluding formworks cum 1 HYSD bar reinforcementRate as per item no 20.9 tonne 0.08</p>		

SECTION 2100 - PRE-STRESSING

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
21.1	2100	<p>Providing, fitting and fixing high tensile steel wires/strands (Tendons) including all accessories for stressing, stressing operations and grouting complete as per Drawing and Technical Specifications. <i>Unit = tonne (For 0.377 tonne)</i> Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)</p> <p>a) Labour</p> <p>i) For making and fixing cables, anchorages Technician day 1.00 Skilled (Blacksmith) day 2.00 Unskilled day 5.00</p> <p>ii) For pre-stressing Technician day 1.00 Skilled (Pre-stressing operator / Fitter) day 1.00 Unskilled day 2.00</p> <p>iii) For grouting Technician day 1.00 Skilled (Mason) day 1.00 Unskilled day 2.00</p> <p>b) Material H.T. Strand tonne 0.39 Sheathing duct ID 66 mm meter 42.00 Tube anchorage set complete with bearing plate, permanent wedges etc. each 2.00 Cement for grouting tonne 0.13 Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items</p> <p>c) Equipment Stressing jack with pump hour 2.50 Grouting pump with agitator hour 1.00 Generator hour 3.50</p>		
	Remarks	Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.		
21.2	2000, 2100	<p>Precast - pre-tensioned Girders</p> <p>Providing, pre-casting, transportation and placing in position precast pre-tensioned concrete girders as per drawing and technical specifications <i>Unit = cum (For 10 cum)</i> Grade of concrete - M 40</p> <p>a) Labour</p> <p>(i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<i>Taking quantity of steel 100 Kg/cum of concrete including laps and wastage</i>		
		Skilled	day	4.00
		Unskilled	day	16.00
		(ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc., pre-stressing and cutting of extra length of HT strand after de-stressing.		
		<i>Taking quantity of HT strand 60 Kg/cum</i>		
		Technician	day	1.00
		Skilled	day	2.00
		Unskilled	day	5.00
		(iii) Erection and dismantling of shuttering		
		<i>Taking shuttering area 10 sqm/cum of concrete</i>		
		Technician	day	1.00
		Skilled	day	10.00
		Unskilled	day	20.00
		(iv) Concreting by Batching plant or concrete mixture and stationary concrete pump		
		Skilled	day	1.00
		Unskilled	day	12.00
		(v) Steam curing and manual curing		
		Skilled	day	1.00
		Unskilled	day	4.00
		(vi) Handling of precast girder, stacking in stockyard and again loading in trailer		
		Skilled	day	1.00
		Unskilled	day	3.00
		(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.		
		Skilled	day	1.00
		Unskilled	day	3.00
		b) Material		
		Cement	tonne	4.70
		Coarse sand	cum	4.50
		20 mm Aggregate	cum	5.40
		10 mm Aggregate	cum	3.60
		Admixture @ 0.4 per cent of cement	Kg	18.80
		HYS steel .	tonne	1.00
		HT strand	tonne	0.60
		LDO for steam curing	Liter	370.00
		Add consumables such as binding wire, foam, packing tape, shuttering oil, HDPE pipe for unbonding of strand, bolt & nuts etc. @ 1 per cent of material cost		
		c) Equipment		
		i) At casting yard		
		Generator	hour	6.00
		Batching Plant	hour	1.00
		Transit Mixer	hour	2.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
21.3	2000, 2100	Concrete Pump stationary	hour	1.00
		Crane	hour	2.00
		Trailer	hour	2.00
		Loader	hour	1.00
		ii) For transportation and placement at site		
		Crane	hour	2.00
		Cost of formwork, steam curing arrangement, pre-tensioning arrangement etc. @ 5 per cent of cost material, Labour and Equipment		
		Providing and fixing Helical pipes in voided concrete slabs as per Drawing and Technical Specifications.		
		<i>Unit = meter (For 10 m)</i>		
		a) Labour		
Technician	day	1.00		
Skilled (Fitter)	day	1.00		
Unskilled	day	3.00		
b) Material				
Helical pipes 600 mm diameter	meter	11.00		
Tie rods 20 mm diameter	nos	10.00		
Consumables for sealing joints etc.@ 5 per cent of cost of material				

SECTION 2200 - STRUCTURAL STEEL WORK

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
22.1	A	2200	<p>Providing , Fabricating , assembling and erecting structural steel components / elements including nut, bolt, gusset plate, including shop drawings, facilities for inspection & testing and trial assembling all complete as per specification. <i>Unit = tonne (For 1 tonne)</i></p> <p>RS Joist</p> <p>a) Labour</p> <p>i) for Fabricating/ assembling</p> <p>Technician day 1.00</p> <p>Skilled (Blacksmith) day 2.00</p> <p>Semiskilled day 2.00</p> <p>Unskilled day 2.00</p> <p>ii) for Erecting</p> <p>Technician day 1.00</p> <p>Skilled (Blacksmith) day 2.00</p> <p>Semiskilled day 4.00</p> <p>Unskilled day 4.00</p> <p>b) Material</p> <p>Structural Steel tonne 1.10</p> <p>Add 3 % cost of of structural steel for Nut , bolt/ Rivet etc.</p> <p>Add 12% of cost of material for heavy zinc coating or Add 5% of cost of material for painting one shop coat with red oxide primer and two coats of synthetic enamel .</p> <p>Add 5.0 per cent cost of structural steel for consumables (gas electrodes drill bits etc.)material for Spacers, Insulation tape and miscellaneous items</p> <p>c) Equipment</p> <p>Crane hour 1.00</p> <p>Add 5.0 per cent cost of steel for cutting, drilling, grinding welding et</p>		
	(p)		<p>For formwork and staging add the following:</p> <p>Height upto 5 m</p> <p>Basic Cost of Labour, Material & Equipment (a+b+c)</p> <p>d) Formwork and staging per cent of (a+b+c)</p>		
	(q)		<p>Height above 5 m to 10 m</p> <p>Basic Cost of Labour, Material & Equipment (a+b+c)</p> <p>d) Formwork and staging per cent of (a+b+c)</p>		
	(r)		<p>Height above 10 m</p> <p>Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		d) Formwork and staging per cent of (a+b+c)		
	Remarks:	1 Cost of steel shall taken including transportation upto site.		
		2 In case of welded section, welding charges per cm length of welding shall substitute cost of riveting		
		3 Shear connectors should always be welded to the top flange. 10 per cent for shear connectors in the typical case is tentative. The quantity shall be worked out as per design.		
		4 The analysis of RCC. deck slab for the composite girder to be adopted from the section 20 of concrete superstructure		
		5 It is preferable to analyze the cost of erection of composite girder type of superstructure for required span range and height range with a project - specific methodology.		
		6 The cost of painting can also be analyzed in detail in accordance corresponding item		
	B	Built up beam, Plate Girder etc.		
		A) Labour		
		i) for Fabricating/ assembling		
		Technician	day	1.00
		Skilled (Blacksmith)	day	3.00
		Semiskilled	day	5.00
		Unskilled	day	5.00
		ii) for Erecting		
		Technician	day	1.00
		Skilled (Blacksmith)	day	3.00
		Semiskilled	day	6.00
		Unskilled	day	6.00
		a) Material		
		Structural Steel	tonne	1.10
		Add 3 % cost of of structural steel for Nut , bolt/ Rivet etc.		
		Add 12% of cost of material for heavy zinc coating or Add 5% of cost of material for painting one shop coat with red oxide primer and two coats of synthetic enamel .		
		Add 5.0 per cent cost of steel for consumables (gas electrodes drill bits etc.)material for Spacers, Insulation tape and miscellaneous items		
		c) Equipment		
		crane	hour	6.00
		Add 5.0 per cent cost of steel for cutting, drilling, grinding welding et		
	(p)	For formwork and staging add the following:		
		Height upto 5 m		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		d) Formwork and staging 25 % of (a+b+c)		
	(q)	Height 5 m to 10 m		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	(r)	Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 30 % of (a+b+c) Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 35 % of (a+b+c)		
	Remarks:	1 Cost of steel shall taken including transportation upto site. 2 Above rate for false work is inclusive of design for false work 3 The materials for false work may be timber, steeled. or their combinations as per contractors option, subject to the approval of the Engineer. 4 Above norms is for general site condition, For typical topographical sites, e. g. gorge these norms may not be applicable. Separate norms specific to the site may have to be developed		
	C	Truss a) Labour i) for Fabricating/ assembling Technician Skilled (Blacksmith) Semiskilled Unskilled ii) for Erecting Technician Skilled /Blacksmith Semiskilled Unskilled	day day day day day day day day day day	2.00 4.00 6.00 6.00 2.00 4.00 8.00 8.00
		b) Material Structural Steel Add 3 % cost of of structural steel for Nut , bolt/ Rivet etc. Add 12% of cost of material for heavy zinc coating or Add 5% of cost of material for painting one shop coat with red oxide primer and two coats of synthetic enamel . Add 5.0 per cent cost of steel for consumables (gas electrodes drill bits etc.) material for Spacers, Insulation tape and miscellaneous items	tonne	1.10
		c) Equipment Crane Add 5.0 per cent cost of steel for cutting, drilling, grinding welding etc.	hour	6.00
	(p)	For formwork and staging add the following: Height upto 5 m		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	(q)	Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 30 % of (a+b+c) Height 5 m to 10 m		
	(r)	Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 35 % of (a+b+c) Height above 10 m		
		Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum d) Formwork and staging 40 % of (a+b+c)		
	Remarks:	1 Cost of steel shall taken including transportation upto site. 2 Above rate for false work is inclusive of design for false work 3 The materials for false work may be timber, steeled. or their combinations as per contractors option, subject to the approval of the Engineer. 4 Above norms is for general site condition, For typical topographical sites, e. g. gorge these norms may not be applicable. Separate norms specific to the site may have to be developed		

SECTION 2300 - TIMBER CONSTRUCTION

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
23.1	A	2300	<p>Providing , Fabricating , assembling and erecting Timber super structures including necessary hardware Unit = cum (For 1 cum) Beam structure a) Labour i) for Fabricating/ assembling Skilled (Carpenter) day 5 Unskilled day 5 ii) for Erecting Skilled (Carpenter) day 5 Unskilled day 10 b) Material Sal wood cum 1.1 Add 5.0 per cent cost of timber for hardware / consumables c) Equipment Add 1.0 per cent cost of Timber for cutting, drilling, etc. For staging add the following: (p) Height upto 4 m Basic Cost of Labour, Material & Equipment (a+b+c) d) For staging 15 % of (a+b+c) (q) Height 4 m to 6 m Basic Cost of Labour, Material & Equipment (a+b+c) d) For staging 20 % of (a+b+c) (r) Height above 6 m Basic Cost of Labour, Material & Equipment (a+b+c) d) For staging 25 % of (a+b+c)</p>		
		Remarks:	Cost of Timber has been taken for delivery at site. Hence carriage has not been considered.		
	B		<p>Truss structure a) Labour i) for Fabricating/ assembling Skilled (Carpenter) day 6.00 Unskilled day 6.00 ii) for Erecting Skilled (Carpenter) day 7.00 Unskilled day 14.00 b) Material Sal wood cum 1.10 Add 5.0 per cent cost of timber for hardware / consumables</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>c) Equipment Add 1.0 per cent cost of Timber for cutting, drilling, etc.</p> <p>For formwork and staging add the following:</p> <p>(p) Height upto 4 m Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 20 % of (a+b+c)</p> <p>(q) Height 4 m to 6 m Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 25 % of (a+b+c)</p> <p>(r) Height above 6 m Basic Cost of Labour, Material & Equipment (a+b+c) d) Formwork and staging 30 % of (a+b+c)</p> <p>Remarks: Cost of Timber has been taken for delivery at site. Hence carriage has not been considered. Above norms is for general site condition, For typical topographical sites, e. g. gorge these norms may not be applicable. Separate norms specific to the site may have to be developed</p>		

SECTION 2400 - RIVER TRAINING AND PROTECTION WORKS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
24.1		2401	Gabion Structure for Retaining Earth Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification		
	A		Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm,		
			Box size 3 X 1 X 1 m (16 sqm) Unit = cum (For 3X1X2 nos =6 cum)		
			a) Labour		
			Unskilled	day	7
			Skilled	day	3
			b) Material		
			Mesh wire	kg	70.2
			Selvedge Wire	kg	7.82
			Binding wire	kg	3.62
			Boulder / Stone	cum	6.6
			ii		
			Box size 2 X 1 X 1 m (11 sqm) Unit = cum (For 2 X 1 X 1X 3 nos = 6 cum)		
			a) Labour		
			Unskilled	day	7
			Skilled	day	3
			b) Material		
			Mesh wire	kg	72.45
			Selvedge Wire	kg	8.88
			Binding wire	kg	3.9
			Boulder / Stone	cum	6.6
			iii		
			Box size 1.5 X 1 X 1 m (9 sqm) Unit = cum (For 1.5 X 1 X 1X 4 nos = 6 cum)		
			a) Labour		
			Unskilled	day	8
			Skilled	day	3
			b) Material		
			Mesh wire	kg	79
			Selvedge Wire	kg	10.8
			Binding wire	kg	5
			Boulder / Stone	cum	6.6
			iv		
			Box size 1.0 X 1 X 1 m (6 sqm) Unit = cum (For 1.0 X 1 X 1X 6 nos = 6 cum)		
			a) Labour		
			Unskilled	day	8
			Skilled	day	3
			b) Material		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Mesh wire	kg	78.96
		Selvedge Wire	kg	12.06
		Binding wire	kg	4.56
		Boulder / Stone	cum	6.6
	v	Box size 3.0 X 1 X 0.75 m (13.5 sqm) Unit = cum (For 3.0 X 1 X 0.75 X 2 nos= 4.5 cum)		
		a) Labour		
		Unskilled	day	6
		Skilled	day	2
		b) Material		
		Mesh wire	kg	59.24
		Selvedge Wire	kg	7.18
		Binding wire	kg	3.34
		Boulder / Stone	cum	4.95
	vi	Box size 2.0 X 1 X 0.75 m (9.25 sqm) Unit = cum (For 2.0 X 1 X 0.75 X 4 nos= 6 cum)		
		a) Labour		
		Unskilled	day	8
		Skilled	day	3
		b) Material		
		Mesh wire	kg	81.16
		Selvedge Wire	kg	10.8
		Binding wire	kg	4.72
		Boulder / Stone	cum	6.6
	vii	Box size 1.0 X 1 X 0.75 m (5 sqm m) Unit = cum (For 1.0 X 1 X 8 nos= 6 cum)		
		a) Labour		
		Unskilled	day	8
		Skilled	day	3
		b) Material		
		Mesh wire	kg	87.76
		Selvedge Wire	kg	14.4
		Binding wire	kg	5.92
		Boulder / Stone	cum	6.6
	viii	Box size 3.0 X 1 X 0.5 m (11 sqm) Unit = cum (For 3.0 X 1 X 0.5 X 4 nos = 6 cum)		
		a) Labour		
		Unskilled	day	8
		Skilled	day	3
		b) Material		
		Mesh wire	kg	96.6

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Selvedge Wire	kg	13.12
		Binding wire	kg	4.76
		Boulder / Stone	cum	6.6
	ix	Box size 2.0 X 1 X 0.5 m (7.5 sqm m) Unit = cum (For 2.0 X 1 X. 0.5 X 6 nos= 6 cum)		
		a) Labour		
		Unskilled	day	9
		Skilled	day	3
		b) Material		
		Mesh wire	kg	98.7
		Selvedge Wire	kg	14.57
		Binding wire	kg	5.1
		Boulder / Stone	cum	6.6
	x	Box size 1 X 1 X 0.5 m (4 sqm) Unit = cum (For x 1 x 0.5 X 12 nos = 6 cum)		
		a) Labour		
		Unskilled	day	9
		Skilled	day	4
		b) Material		
		Mesh wire	kg	105.36
		Selvedge Wire	kg	19.08
		Binding wire	kg	6.24
		Boulder / Stone	cum	6.6
	xi	Box size 3 X 1 X 0.3 m (9 sqm) Unit = cum (For 3.0 X 1 X 0.3 X 7 nos = 6.3 cum)		
		a) Labour		
		Unskilled	day	10
		Skilled	day	4
		b) Material		
		Mesh wire	kg	138.25
		Selvedge Wire	kg	21.18
		Binding wire	kg	5.53
		Boulder / Stone	cum	6.93
	Xii	Box size 2 X 1 X 0.3 m (6.1 sqm) Unit = cum (For 2.0 X 1 X 0.3 X 10 nos = 6 cum)		
		a) Labour		
		Unskilled	day	9
		Skilled	day	3
		b) Material		
		Mesh wire	kg	134
		Selvedge Wire	kg	22.2

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Binding wire	kg	5.8
			Boulder / Stone	cum	6.6
	Xiii		Box size 1 X 1 X 0.3 m (2.2 sqm) Unit = cum (For 1.0 X 1 X 0.3 X 20 nos = 6 cum)		
			a) Labour		
			Unskilled	day	9
			Skilled	day	3
			b) Material		
			Mesh wire	kg	96.6
			Selvedge Wire	kg	28.27
			Binding wire	kg	7.2
			Boulder / Stone	cum	6.6
	B	2401	Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 80 mm X 100 mm,		
	i		Box size 3 X 1 X 1 m (16 sqm) Unit = cum (For 3.0 X 1 X 1 X 2 nos = 6 cum)		
			a) Labour		
			Unskilled	day	8
			Skilled	day	3
			b) Material		
			Mesh wire	kg	82.6
			Selvedge Wire	kg	7.82
			Binding wire	kg	4.12
			Boulder / Stone	cum	6.6
	ii		Box size 2 X 1 X 1 m (11 sqm) Unit = cum (For 2 X 1 X 1 X 3 nos = 6 cum)		
			a) Labour		
			Unskilled	day	8
			Skilled	day	3
			b) Material		
			Mesh wire	kg	85.2
			Selvedge Wire	kg	8.87
			Binding wire	kg	4.38
			Boulder / Stone	cum	6.6
	iii		Box size 1.5 X 1 X 1 m (9 sqm) Unit = 1 cum (For 1.5 x 1X 4 nos = 6 cum)		
			a) Labour		
			Unskilled	day	8
			Skilled	day	3
			b) Material		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Mesh wire	kg	93
		Selvedge Wire	kg	10.75
		Binding wire	kg	5.68
		Boulder / Stone	cum	6.6
	iv	Box size 1 X 1 X 1 m (6 sqm) Unit = cum (For 1 x 1X 6 nos = 6 cum)		
		a) Labour		
		Unskilled	day	8
		Skilled	day	3
		b) Material		
		Mesh wire	kg	92.94
		Selvedge Wire	kg	12.07
		Binding wire	kg	5.22
		Boulder / Stone	cum	6.6
	v	Box size 3.0 X 1 X 0 .75 m (13.5 sqm) Unit = cum (For 3 x 1 x 0 .75 X 2 nos = 4.5 cum)		
		a) Labour		
		Unskilled	day	8
		Skilled	day	3
		b) Material		
		Mesh wire	kg	69.7
		Selvedge Wire	kg	7.18
		Binding wire	kg	3.8
		Boulder / Stone	cum	4.95
	vi	Box size 2.0 X 1 X 0 .75 m (9.25 sqm) Unit = cum (For 2 x . = 6 cum)		
		a) Labour		
		Unskilled	day	8
		Skilled	day	3
		b) Material		
		Mesh wire	kg	95.52
		Selvedge Wire	kg	10.79
		Binding wire	kg	5.4
		Boulder / Stone	cum	6.6
	vii	Box size 1.0 X 1 X 0 .75 m (5 sqm) Unit = cum (For 8 nos = 6 cum)		
		a) Labour		
		Unskilled	day	9
		Skilled	day	3
		b) Material		
		Mesh wire	kg	103.28

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Selvedge Wire	kg	14.36
		Binding wire	kg	6.4
		Boulder / Stone	cum	6.6
	viii	Box size 3.0 X 1 X 0.5 m (11 sqm) Unit = For (3 X 1 X 0.5 X 4 nos = 6 cum)		
		a) Labour		
		Unskilled	day	9
		Skilled	day	3
		b) Material		
		Mesh wire	kg	113.6
		Selvedge Wire	kg	13.11
		Binding wire	kg	5.44
		Boulder / Stone	cum	6.6
	ix	Box size 2.0 X 1 X 0.5 m (7.5 sqm) Unit= cum (For 6 nos = 6 cum)		
		a) Labour		
		Unskilled	day	9
		Skilled	day	3
		b) Material		
		Mesh wire	kg	116.4
		Selvedge Wire	kg	14.57
		Binding wire	kg	6.18
		Boulder / Stone	cum	6.6
	x	Box size 1 X 1 X 0.5 m (4 sqm) Unit = cum (For x 12 nos =)		
		a) Labour		
		Unskilled	day	10
		Skilled	day	3
		b) Material		
		Mesh wire	kg	123.96
		Selvedge Wire	kg	19.04
		Binding wire	kg	7.56
		Boulder / Stone	cum	6.6
	xi	Box size 3 X 1 X 0.3 m (9 sqm) Unit = cum (For x 0.3 X 7 nos = 6.3 cum)		
		a) Labour		
		Unskilled	day	11
		Skilled	day	4
		b) Material		
		Mesh wire	kg	162.75
		Selvedge Wire	kg	21.18

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Binding wire	kg	6.93
		Boulder / Stone	cum	6.93
	xii	Box size 2 X 1 X 0 .3 m (6.1 sqm) Unit = cum (For x 10 nos = 6 cum) a) Labour Unskilled Skilled b) Material Mesh wire Selvedge Wire Binding wire Boulder / Stone	day day kg kg kg cum	11 4 157.5 22.2 7.2 6.6
	xiii	Box size 1 X 1 X 0 .3 m (2.2 sqm) Unit = cum (For 20 nos = 6 cum) a) Labour Unskilled Skilled b) Material Mesh wire Selvedge Wire Binding wire Boulder / Stone	day day kg kg kg cum	11 3 113.6 28.27 9 6.6
24.2	2402	Providing mechanically woven double twisted crates / mattress including rolling, cutting and with lacing wire and binding wire as per specification.		
	A	Heavy zinc coated Hexagonal mesh type 100 mm x 120 mm, mesh wire 3 mm, selvage wire 3.9 mm, lacing wire 2.4 mm	sqm	1
	B	Heavy zinc coated Hexagonal mesh type 100 mm x 120 mm, mesh wire 2.7 mm, selvage wire 3.4 mm, lacing wire 2.2 mm	sqm	1
	C	Heavy zinc coated Hexagonal mesh type 80 mm x 100 mm, mesh wire 3 mm, selvage wire 3.9 mm, lacing wire 2.4 mm	sqm	1
	D	Heavy zinc coated Hexagonal mesh type 80 mm x 100 mm, mesh wire 2.7 mm, selvage wire 3.4 mm, lacing wire 2.2 mm	sqm	1
	E	Heavy zinc coated Hexagonal mesh type 60 mm x 80 mm, mesh wire 2.7 mm, selvage wire 3.4 mm, lacing wire 2.2 mm	sqm	1

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	F		Zinc + PVC coated Hexagonal mesh type 100 mm x 120 mm, mesh wire 2.7 mm/3.7 mm, selvage wire 3.4 mm/4.4 mm, lacing wire 2.2 mm/3.2 mm with Pac coating thickness nominal 0.5 mm (minimum 0.38 mm)	sqm	1
	G		Zinc + PVC coated Hexagonal mesh type 80 mm x 100 mm, mesh wire 2.2 mm/3.2 mm, selvage wire 2.7 mm/3.7 mm, lacing wire 2.2 mm/3.2 mm with Pac coating thickness nominal 0.5 mm (minimum 0.38 mm)	sqm	1
24.3		2402	Assembling mechanical woven Gabion boxes /mattresses, placing in position including stretching; forming compartments; tying the sides and diaphragms with binding wire in each mesh; tying with bracing wires and tie wires; and tying down the lid complete as per specification (stone filling not included) Unit = sqm (For 160 sqm) a) Labour Skilled Unskilled	day day	2 10
		Remarks:	Lacing wire/ binding wire is included in item no 24.02		
24.4		2402	Providing and filling stone/boulder in gabion boxes/mattress etc.. Including dressing, bedding, bonding all complete as per Drawing and Technical Specifications. Unit = cum (For 10 cum) a) Labour Skilled Unskilled b) Material Boulder / Stone	day day cum	2 8 11
		Remarks:	The quantity of Earthwork Excavation and Backfill shall be as per approved design and specifications and shall be priced separately.		
24.5		2404	Laying and fixing of Geo-Textile all complete as per specification. Providing and laying of a geotextile filter between pitching and embankment slopes as per Drawing and Technical Specifications. Unit = sqm (For 300 sqm) a) Labour Skilled Unskilled b) Material Geotextile	day day sqm	1 2 360

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Remarks: 1. Geotextile is including 20 % overlap 2. The quantity of Earthwork Excavation and Backfill shall be as per approved design and specifications and shall be priced separately.		
24.06	2403.2	Providing and laying and fixing of Geo-membrane all complete as per specification. Unit = sqm (For 300 sqm) a) Labour Skilled Unskilled b) Material Geotextile	day day sqm	1 2 360
		Remarks: Geotextile is including 20 % overlap		
24.7	2404	GEOSYNTHETIC AND REINFORCED EARTH Sub-Surface Drain with Geotextiles Providing and laying sub surface drain 200 mm dia using geotextiles treated with carbon black to a stable network and a planar geo-composite structure, joints wrapped with geotextile to prevent ingress of soil, including excavation and backfilling as per Drawing and Technical Specifications. Unit = meter (For 10 m.) a) Labour Skilled Unskilled b) Material Geonets, geomembrane and geotextile to make planar geocomposite stable network for sub surface drain including wrapping of joints with 160 mm over lapping with geotextile . Geonets Geomembrane Geotextile Add 2 per cent cost of Material for miscellaneous items like synthetic cord	day day sqm sqm sqm	2 10 11 11 22
		Remarks: Surplus excavated Material to be used at site. Hence separate cost for disposal not added.		
24.8	2404	Narrow Filter Sub-Surface Drain Providing and making narrow filter sub- surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed including excavation and backfilling Unit = meter (For 10 m)		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>a) Labour</p> <p>Skilled day 2</p> <p>Unskilled day 10</p> <p>b) Material</p> <p>Perforated geosynthetic pipe 150 mm dia meter 11</p> <p>Geotextile filter fabric sqm 12.5</p> <p>Add 2 per cent cost of Material for miscellaneous item like synthetic cord</p> <p>Remarks: Surplus excavated Material to be used at site. Hence Separate cost for disposal not added.</p>		
24.9	2410	<p>Laying Paving Fabric Beneath a Pavement Overlay</p> <p>Providing and laying paving fabric over a tack coat of paving grade Bitumen, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer as per Drawing and Technical Specifications.</p> <p>Unit = sqm (For 2800 sqm)</p> <p>a) Labour</p> <p>Skilled day 1</p> <p>Unskilled day 30</p> <p>b) Material</p> <p>Paving Fabric sqm 2940</p> <p>Paving Bitumen tonne 2.8</p> <p>c) Equipment</p> <p>Road sweeper hour 6</p> <p>Pneumatic roller hour 6</p> <p>Bitumen pressure distributor hour 6</p>		
24.10	2400	<p>Laying Boulder Apron in Crates of Synthetic Geogrids</p> <p>Providing and laying of Geogrids crated apron 1 m x 5 m, 600 mm thick with baffles at 1 meter interval, made with Geogrids as per Design, Drawing and Technical specifications. design.</p> <p>Unit = cum (For 3.0 cum)</p> <p>a) Labour</p> <p>skilled day 1</p> <p>Unskilled day 2</p> <p>b) Material</p> <p>Geo grids sqm 21</p> <p>Connectors/ Staples nos. 50</p> <p>Polymer braids meter 20</p> <p>Stones with minimum size of 200 mm cum 3.45</p> <p>Stones spall for filling voids cum 0.45</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
24.11	(i)	2405, 2406, 2407	Reinforced Earth Structures		
	A		<p>Assembling, joining and laying of reinforcing elements.</p> <p>Providing, laying and joining reinforcing elements With reinforcing element of steel / Aluminum strips / polymeric strips. Unit = meter (For 450 m)</p> <p>a) Labour Unskilled day 9 Skilled day 3</p> <p>b) Material @ Reinforcement strips 60 mm wide 5 mm thick as per specification</p> <p>1. Galvanized carbon steel strips meter 495 or 2. Copper Strips meter 495 or 3. Aluminum Strips meter 495 or 4. Stainless steel strips meter 495 or 5. Glass reinforced polymer/fiber reinforced polymer/polymeric strips meter 495</p> <p>Add 10 per cent of the cost of reinforcing strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the facia panels, overlaps, heat bonding or extension.</p>		
	Remarks:		Any one of the above alternative may be adopted as per approved design.		
	B		<p>Providing, laying and joining reinforcing elements with reinforcing elements of synthetic Geogrids Unit = sqm (For 300 sqm)</p> <p>a) Labour Unskilled day 9 Skilled day 4</p> <p>b) Material Synthetic Geogrids as per approved design and specifications. Add 10 per cent of the cost of reinforcing elements (synthetic Geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the facia panels, overlaps and other protective elements for synthetic Geogrids.</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	(ii)		Providing and laying Facing elements of RCC Unit = sqm (For 75 sqm) a) Labour Unskilled Skilled b) Equipment Crane c) Material Pre-cast RCC M-35 facing elements of size as per design and 18 cm thick for 75 sqm. HYSD steel @ 5 kg / sqm Add 2 per cent of cost of facia panels, for all necessary temporary form work, scaffolding and provision of loops/lugs for lifting of panels and joining the reinforcing elements.	day day hour cum tonne	5 2 6 13.5 0.38
		Remarks:	<p>1. Drainage arrangement shall be made as per approved design and drawings and shall be priced seperately. quantity of filler media shall be calculated as per approved design and specifications and shall be priced separately.</p> <p>3. Excavation for foundation, backfilling including foundation concrete and groove in the foundation for seating of bottom , facia panel and capping beam to be calculated as per design and priced separately.</p> <p>4. The compacted earth filling to be retained shall form part of embankment.</p> <p>5. Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.</p>		
24.12		2411	Providing and Installation of soil nailing with semi-flexible 3-D galvanized steel mat for slope protection and erosion control Providing 3-D galvanized steel panels from the palette, cutting them if necessary, joining the panels to longer rows by overlapping and binding as necessary and putting on the slope, insertion of distribution bars or steel ropes , fixing with clamps and marking holes for T-nails or static nails (bored nails) Unit = sqm (For 40 sqm) a) Labour Skilled Unskilled b) Material 3-D galvanized steel Profile 12 mm bars (in case of T-nails) Clamps Binding wire loops 12 mm dia. Steel rope in case of bored cement grouted GEWI nails *	day day kg kg nos. nos. kg	1 2 138 59.808 16 200 45.024
		A			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Connecting elements for steel ropes for GEWI Nails *	nos.	24
	Remarks:	* These materials are used only in connection with GEWI nails items and depend on the no of GEWI nails Metal and wire cutter, safety cables, wrench, hammer, stairs, metal steps etc. T & P will be covered by Overhead		
	B 1	Providing and filling the installed 3-D galvanized steel profile with angular material of size 32-63 mm using equipment such as excavator, dredger crane or loader		
	i	In shallow slopes (< 45 degrees slope angle) Unit = sqm (For 150 sqm) a) Labour Skilled Unskilled b) Material Angular gravel 32-63 mm c) Equipment Dredger crane, loader (0.25-0.5 m ³) or bucket conveyer belt	day day cum hour	1 1 7.5 6
	ii	In slopes (>45 degrees slope angle) Unit = sqm (For 120 sqm) a) Labour Skilled Unskilled b) Material Angular gravel 32-63 mm c) Equipment Dredger crane,/ loader	day day cum hour	1 1 6 6
	B 2	OR Filling the installed 3-D galvanized steel profile with gravel size 32-63 mm, manually		
	i	In shallow slopes (< 45 degrees slope angle) Unit = sqm (For 150 sqm) a) Labour Skilled Unskilled b) Material Angular gravel 32-63 mm	day day cum	2 6 7.5
	ii	In slopes (>45 degrees slope angle) Unit = sqm (For 120 sqm) a) Labour Skilled	day	2

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	7
			b) Material Angular gravel 32-63 mm	cum	6
	C 1		Spraying of humus on the on the top of gravel (on the top surface of 3-D profile) using humus spraying machine		
	i		In shallow slopes (< 45 degrees slope angle) Unit = sqm (For 150 sqm)		
			a) Labour Skilled	day	1
			Unskilled	day	1
			b) Material Humus material	cum	8.2
			c) Equipment Humus spraying machine	hour	6
	ii		In slopes (>45 degrees slope angle) Unit = sqm (For 120 sqm)		
			a) Labour Skilled	day	1
			Unskilled	day	1
			b) Material Humus material	cum	7.2
			c) Equipment Humus spraying machine,	hour	6
	C II		Spraying of humus on the on the top of gravel (on the top surface of 3-D profile) manually		
	i		In shallow slopes (< 45 degrees slope angle) Unit = sqm (For 150 sqm)		
			a) Labour Skilled	day	2
			Unskilled	day	20
			b) Material Humus material	cum	6.75
	ii		In slopes (>45 degrees slope angle) Unit = sqm (For 120 sqm)		
			a) Labour Skilled	day	4
			Unskilled	day	30
			b) Material Humus material	cum	6

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	D	Providing and driving the equal angle T-section galvanized steel nails with curved head (16 mm dia steel hook) and tapered at tail (size between T-25 x 25 x 3 mm to T-40 X 40 X 5 mm, (equivalent to Indian Steel ISA 2525, 3030,3535 or 4040) by using handheld or pneumatic hammer (nail length between 0.6 m -3.5 m), first drilling a hole of diameter 28-43 mm (size of T-section+ 3 mm) and filling with cement mortar and then driving the nails to fix the semi-flexible 3-D galvanized steel panel on the slopes or embankments, max spacing of nails is 1.5 m.		
	i	Driving T-nails in soft soil using small dia. pre-bored holes without using cement mortar		
	p	For flat surface and shallow slopes < 45° Unit = meter (For 100 m.) Taking output = 100 meter		
		a) Labour		
		Skilled	day	3
		Unskilled	day	3
		b) Material		
		Galvanized T-steel profile 25 x 25 x 3 mm	kg	129
		or		
		30 x 30 x 3 mm *	kg	159
		or		
		35 X 35 X 4 mm *	kg	236
		c) Equipment		
		Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	20 % of Labour cost	
		Air compressor with pneumatic chisel attachment	hour	12
	Remarks:	for other size of nail (30 mm or 35 mm) use different value of nail cost.		
	q	In slopes (>45 degrees slope angle) Unit = meter (For 100 m.)		
		a) Labour		
		Skilled	day	4
		Unskilled	day	4
		b) Material		
		Galvanized T-steel profile 25 x 25 x 3 mm	kg	129
		or		
		30 x 30 x 3 mm	kg	159
		or		
		35 X 35 X 4 mm	kg	236
		c) Equipment		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	20 % of Labour cost	
		Air compressor with pneumatic chisel attachment	hour	12
	Remarks:	for other size of nail (30 mm or 35 mm) use different value of nail cost.		
	ii	Driving T-nails in rocky soil using bigger dia. pre-bored holes using cement mortar		
	p	For flat surface and shallow slopes < 45° Unit = meter (For 100 m.)		
		a) Labour		
		Skilled	day	6
		Unskilled	day	6
		b) Material		
		Galvanized T-steel profile 25 x 25 x 3 mm	kg	129
		40 X 40 X 5 mm	kg	326
		Cement	kg	250
		c) Equipment		
		Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	20 % of Labour cost	
		Air compressor with pneumatic chisel attachment	hour	18
	q	In slopes (>45 degrees slope angle) Unit = meter (For 100 m.)		
		a) Labour		
		Skilled	day	6
		Unskilled	day	6
		b) Material		
		Galvanized T-steel profile 25 x 25 x 3 mm	kg	129
		40 X 40 X 5 mm	kg	326
		Cement	kg	250
		c) Equipment		
		Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	10 % of Labour cost	
		Air compressor with pneumatic chisel attachment	hour	18

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	E i	Providing and driving of 28 mm dia GEWI (Threaded) steel nails by drilling holes of 90 mm dia using cement grouting for fixing of semi-flexible 3-D steel mats upto a length of 4 to 8 m on slopes On soft soils Unit = meter (For 100 m.)		
		a) Labour		
		Skilled	day	4
		Unskilled	day	4
		b) Material		
		28 mm dia GEWI-steel bar	kg	483
	Cement	kg	800	
	c) Equipment			
	Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	25 % of Labour cost		
	Air compressor with pneumatic chisel attachment	hour	12	
	OR excavator mounted Boring Lafitte (horizontal drilling machine)	hour	12	
	ii	On rocky soils (4-8 m) Unit = meter (For 100 m.)		
a) Material				
28 mm dia GEWI-steel bar		kg	483	
Cement		kg	600	
b) Labour				
Skilled		day	5	
Unskilled	day	5		
c) Equipment				
Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	20 % of Labour cost			
Air compressor with pneumatic chisel attachment	hour	12		
OR excavator mounted Boring Lafitte (horizontal drilling machine)	hour	12		
F i	Providing and driving of 28 mm dia GEWI (Threaded) steel nails by drilling holes of 90 mm dia using cement grouting for fixing of semi-flexible 3-D steel mats upto a length >8 m on slopes On soft soils Unit = meter (For 100 m.)			
	a) Labour			
	Skilled	day	6	
Unskilled	day	6		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
24.13	ii		b) Material 28 mm dia GEWI-steel bar	kg	483	
			Cement	kg	800	
			c) Equipment Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	25 % of Labour cost		
			Air compressor with pneumatic chisel attachment	hour	18	
			OR excavator mounted Boring Lafitte (horizontal drilling machine)	hour	18	
			On rocky soils Unit = meter (For 100 m.)			
	A	2416	Providing and laying boulders apron on river bed for protection against scour with Boulder / Stones weighing not less than 40 kg each complete as per drawing and Technical specification. Manual Means Unit = cum (For 1 cum)	a) Labour Skilled	day	8
				Unskilled	day	8
				b) Material 28 mm dia GEWI-steel bar	kg	483
				Cement	kg	600
				c) Equipment Bore drill bits of different diameters, extension rods, cement slurry pump, special hammer head for T-nails, handheld or safety cables, stairs, temporary scaffolding and other materials such as sand and cement admixtures accessories as necessary	20 % of Labour cost	
				Air compressor with pneumatic chisel attachment	hour	24
B	2416	Providing and laying boulders apron on river bed for protection against scour with Boulder / Stones weighing not less than 40 kg each complete as per drawing and Technical specification. Mechanical means Unit = cum (For 100 cum)	OR excavator mounted Boring Lafitte (horizontal drilling machine)	hour	24	
			a) Labour Skilled	day	1	
			Unskilled	day	3	
			b) Material Stone	cum	1	
			Stone Spalls	cum	0.2	

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
24.14	C	Skilled	day	2
		Unskilled	day	4
		b) Material		
		Stone weighing not less than 40 kg	cum	100
		Stone spalls of minimum 25 mm size	cum	20
		c) Equipment		
		Hydraulic excavator	hour	6
		Mechanical means for Bigger boulder		
		Unit = cum (For 100 cum)		
		a) Labour		
		Skilled	day	2
		Unskilled	day	6
		b) Material		
		Stone weighing not less than 200 kg	cum	100
Stone spalls	cum	20		
c) Equipment				
Crane 15 t capacity	hour	12		
24.14	A	2416 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 a minimum cement content of 250 kg/cum .		
		Unit = cum (For 1 cum)		
		Manual means		
		a) Labour		
		Skilled	day	1
		Unskilled	day	3
		b) Material		
		Concrete Grade M 15	cum	1.1
		B		
		Mechanical means		
		Unit = cum (For 100 cum)		
		a) Labour		
		Skilled	day	2
		Unskilled	day	4
b) Material				
Concrete Grade M 15	cum	110		
c) Equipment				
Hydraulic excavator	hour	6		
Remarks:		Including excavation for trimming for preparation of bed.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
24.15	A	2416	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 Stone/Boulder Unit = cum (For 1 cum) a) Labour Skilled Unskilled b) Material Stone weighing > 40 kg Stone spalls (minimum 25 mm size)	day day cum cum	1 3 1 0.2
	B I		Cement Concrete Blocks of size 0.3 x 0.3 x 0.3 m cast in cement concrete of Grade M 15 Manual Means Unit = cum (For 1 cum) a) Labour Skilled Unskilled b) Material Concrete Grade M 15	day day cum	1 3 1.1
24.16		2414	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification Taking output = 1 cum a) Labour Skilled Unskilled b) Material Graded stone aggregate of required size	day day cum	1 3 1.2
		Remarks:	Rate Includes Labour required for trimming of slope to proper profile and preparation of bed.		
24.17		2416	Providing and laying Grouted Stone Pitching in protection work, with stone size not less than 0.01 cum and cement: sand mortar (1:3) all complete as per Drawing and Technical Specifications. Unit = cum (For 1 cum) a) Labour Skilled Unskilled b) Material Stone Cement Sand	day day cum cum cum	1 3 1.1 0.194 0.42

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
24.18	A	2413	Providing and laying 20 mm dia tor steel dowel bar including drilling 35 mm dia bore hole in rock necessary bending, hooking tying reinforcement in position and grouting etc. complete as per Drawing and Technical specifications. Without using Mechanical aid Unit = meter (For 10 m.) a) Labour Skilled Unskilled b) Material Dowel Bar 20 mm dia or as specified Grouting Materials Grouting material	day	2
				day	15
	B		Using Mechanical Aid Unit = meter (For 40 m.) a) Labour Skilled Unskilled b) Material Dowel Bar 20 mm dia or as specified Grouting Materials Grouting material c) Equipment Air Compressor with jack hammer/ Portable rock driller	meter	11
				10 % of Dowel bar	
		Remarks:	For other size of Dowel bar rate will be derived on the basis of per meter weight of bar.		
24.19		2413	Providing and fixing of 25 mm – dia steel rock bolts with mechanical/ wedge type anchorage including drilling 35 mm dia hole providing 150 mm long 20 mm thick steel tapered wedge 10 mm thick 200 mm X 200 mm plate washer and nuts, tighten bolt by torque wrench all complete Unit = meter (For 10 m.) a) Labour Skilled Unskilled b) Material Drilling platform Drill bits Rock Dowel rod (25 mm) Hexagonal Anchor Coupling Anchor plate with hexagonal nut cement Admixture (@ 5 % of cement)	day	2
				day	20
				20 % of Labour	
				nos.	1
				m	10
				nos.	3.3
				nos.	0.7
				kg	10
				kg	0.5

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
24.20	A	2414	c) Equipment Air Compressor Jack Hammer including Casing pipe and accessories Grout Injection Equipment Pull out test of Anchor	hour hour hour 5 % of Labour cost	6 6 6
			Providing and laying HDPE pipes with perforations including joining series II, HDPE pipe 250 mm dia Unit = meter (For 100 m.) a) Labour Semi Skilled Skilled Unskilled b) Material HDPE pipes 250 mm c) Equipment Generator screw jack Electric heating Plate Electric hand driller	day day day meter hour hour hour hour	2 3 10 110 24 18 18 12
	B		series II, HDPE pipe 160 mm dia Unit = meter a) Labour Semi Skilled Skilled Unskilled b) Material HDPE pipe c) Equipment Generator screw jack Electric heating Plate Electric hand driller	day day day meter hour hour hour hour	2 3 10 110 24 18 18 12
			Remarks:		
24.21	A I	2421	Providing and laying Plum concrete (Boulder mixed concrete) as per Drawing and Specifications 60% M 15 concrete and 40% boulders/stones using Mechanical Aids Unit = cum (For 10 cum) a) Labour Skilled	day	3

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	30
			b) Material		
			Cement	tonne	1.7
			Aggregates		
			20-40 mm	cum	3.45
			10-20 mm	cum	1.56
			5-10 mm	cum	0.72
			sand	cum	3
			Boulder stones	cum	4.4
			c) Equipment		
			concrete mixer	hour	6
			concrete vibrator	hour	6
	II		Manual means		
			Unit = cum (For 1 cum)		
			a) Labour		
			Skilled	day	1
			Unskilled	day	4
			b) Material		
			Cement	tonne	0.185
			Aggregates		
			20-40 mm	cum	0.156
			10-20 mm	cum	0.072
			5-10 mm	cum	0.299
			sand	cum	0.299
			Boulder stones	cum	0.44
	B		70% M 15 concrete and 30% boulders/stones		
	I		Using Mechanical Aids		
			Unit = cum (For 10 cum)		
			a) Labour		
			Skilled	day	4
			Unskilled	day	30
			b) Material		
			Cement	tonne	1.95
			Aggregates		
			20-40 mm	cum	4
			10-20 mm	cum	1.8
			5-10 mm	cum	0.8
			sand	cum	3.45
			Boulder stones	cum	3.3
			c) Equipment		
			concrete mixer	hour	6
			concrete vibrator	hour	6

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
24.22	II	Manual means		
		a) Labour		
		Skilled	day	1
		Unskilled	day	4
		b) Material		
		Cement	tonne	0.214
		Aggregates		
		20-40 mm	cum	0.398
		10-20 mm	cum	0.18
		5-10 mm	cum	0.082
sand	cum	0.345		
Boulder stones	cum	0.33		
24.23	2414	Sub-Surface Drains with Perforated Pipe		
		Providing and laying subsurface drain with perforated pipe of 100 mm internal diameter of metal/ asbestos cement/ cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe,. as per Drawing and Specifications.		
		Unit = meter (For 10 m.)		
		a) Labour		
		Skilled	day	1
		Unskilled	day	3
		b) Material		
		Perforated pipe of cement concrete, internal dia 100 mm	meter	11
		Crushed stone as per specification	cum	2.4
		Remarks:		
1. Type of pipe shall be select depending upon provision of Design.				
2. cross section of excavation shall be as per drawing, recommended size is 450 x 550 mm.				
24.23	2414	Aggregate Sub-Surface Drains		
		Providing and laying aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to table 300-4, excavated material to be utilized in roadway.		
		Unit = meter (For 10 m.)		
		a) Labour		
Skilled	day	1		
Unskilled	day	3		
b) Material				
Crushed stone	cum	1.35		
24.24	2414	Underground Drain at Edge of Pavement		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>Providing and laying an underground drain 1 m x 1 m (inside dimensions) lined with RCC-20 cm thick and covered with RCC slab 10 cm in thickness on urban roads.</p> <p>Unit = meter (For 1 m.)</p> <p>a) Earthwork in soil</p> <p>b) RCC work M-20</p> <p>c) Reinforcement work @ 3 % of concrete volume</p>	<p>cum</p> <p>cum</p> <p>kg</p>	<p>1.5</p> <p>0.495</p> <p>117</p>
	Remarks:	Rates for these items may be taken from corresponding sections on earthwork and substructures of concrete respectively.		

SECTION 2500 - BRICK WORKS FOR STRUCTURES

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
25.1	2500	Providing and laying Brick Masonry Work in Cement mortar in Foundation / structure complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.			
		<i>Unit = cum (For 5 cum)</i>			
		A	Cement sand mortar (1:2)		
			a) Labour		
			Skilled	day	6.00
			Unskilled	day	12.00
			b) Material		
			Bricks Ist class	nos	2800.00
			Cement	tonne	0.80
			Sand	cum	1.12
			Cost of water	KL	0.10
		B	Cement sand mortar (1:3)		
			a) Labour		
			Skilled	day	6.00
			Unskilled	day	12.00
			b) Material		
			Bricks Ist class	nos	2800.00
			Cement	tonne	0.61
			Sand	cum	1.26
			Cost of water	KL	0.10
C	Cement sand mortar (1:4)				
	a) Labour				
	Skilled	day	6.00		
	Unskilled	day	12.00		
	b) Material				
	Bricks Ist class	nos	2800.00		
	Cement	tonne	0.48		
	Sand	cum	1.35		
	Cost of water	KL	0.10		
D	Cement sand mortar (1:6)				
	a) Labour				
	Skilled	day	6.00		
	Unskilled	day	12.00		
	b) Material				
	Bricks Ist class	nos	2800.00		
	Cement	tonne	0.35		
	Sand	cum	1.45		
	Cost of water	KL	0.10		
Remarks:		If Concrete mixture is proposed to mix mortar provide concrete mixture 0.75 hr. and reduce 3 unskilled day on every 5 cum, in above specified value of item no 25.1.			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
25.2	(A)	2500	Providing and laying Brick masonry work in superstructure/ sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications		
			Cement Mortar 1:2 (1 cement : 2 sand)		
			<i>Unit = cum (for 5 cum)</i>		
			a) Labour		
			Skilled	day	6.00
			Unskilled	day	12.00
			b) Material		
			Bricks Ist class	nos	2800.00
			Cement	tonne	0.61
			Sand	cum	1.26
	Cost of water	KL	0.10		
	Add 5 per cent of cost of Labour and material for scaffolding				
	(B)	2500	Cement Mortar 1:3 (1 cement : 3 sand)		
			<i>Unit = cum (For 5 cum)</i>		
			b) Labour		
			Skilled	day	7.00
			Unskilled	day	14.00
			b) Material		
			Bricks Ist class	nos	2800.00
			Cement	tonne	0.61
Sand			cum	1.26	
Cost of water			KL	0.10	
Add 5 per cent of cost of Labour and material for scaffolding					
(C)	2500	Cement Mortar 1:4 (1 cement : 4 sand)			
		<i>Unit = cum (For 5 cum)</i>			
		a) Labour			
		Skilled	day	7.00	
		Unskilled	day	14.00	
		b) Material			
		Bricks Ist class	nos	2800.00	
		Cement	tonne	0.48	
		Sand	cum	1.35	
		Cost of water	KL	0.10	
Add 5 per cent of cost of Labour and material for scaffolding					
(D)	2500	Cement Mortar 1:6 (1 cement : 6 sand)			
		<i>Unit = cum(For 5 cum)</i>			
		a) Labour			
		Skilled	day	7.00	
Unskilled	day	14.00			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
25.3		b) Material Bricks Ist class Cement Sand Cost of water Add 5 per cent of cost of Labour and material for scaffolding	nos tonne cum KL	2800.00 0.35 1.45 0.10
	Remarks:	If Concrete mixture is proposed to mix mortar provide concrete mixture 0.75 hr. and reduce 3 unskilled md on every 5 cum, in above specified value of item no 25.2.		
25.3	2500	Providing, and applying Pointing with cement mortar (1:3) on brick work in structure as per Technical Specifications . <i>Unit = sqm (For 100 sqm)</i>		
	Remarks:	Scaffolding is already included in previous items of brick works		
25.4		2500 Providing and applying 12.5 mm thick Plaster with cement mortar on brick work structure as per Technical Specifications		
	A	Cement Mortar 1:2 (1 cement : 2 sand) <i>Unit = sqm (For 10 sqm)</i>		
		a) Labour Skilled Unskilled	day day	10.00 12.00
		b) Material Cement Sand Cost of water	tonne cum KL	0.15 0.32 1.00
	B	Cement Mortar 1:3 (1 cement : 3 sand) <i>Unit = sqm (For 10 sqm)</i>		
		a) Labour Skilled Unskilled	day day	10.00 12.00
		b) Material Cement Sand Cost of water	tonne cum KL	0.72 1.50 0.20
	C	Cement Mortar 1:4 (1 cement : 4 sand)		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
25.5	2500	<p><i>Unit = sqm (For 10 sqm)</i></p> <p>a) Labour Skilled day 10.00 Unskilled day 12.00</p> <p>b) Material Cement tonne 0.58 Sand cum 1.60 Cost of water KL 0.17</p>		
		<p>Remarks:</p> <p>1. Scaffolding is already included in brick works 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. 3. If Concrete mixture is proposed to mix mortar provide concrete mixture 0.75 hr. and reduce 2 unskilled md on every 100 sqm, in above specified value of item no 25.4.</p>		
25.5	2500	<p>Providing and laying weep holes in Brick works / Masonry/ Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia HDPE pipe as per Drawing and Technical Specifications. <i>Unit = meter (For 30 m.)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 1.00</p> <p>b) Material AC pipe 100 mm dia. (including wastage @ 5 per cent) meter 31.50 Average length of weep hole is taken as one meter for the purpose of estimating. MS clamp nos 30.00 collar for AC pipe (average) taking 10% of above pipe rate nos 10.00 Cement tonne 0.02 Sand cum 0.06</p>		
		<p>Remarks:</p> <p>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.</p>		

SECTION 2600 - MASONRY FOR STRUCTURES

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
26.1	2602, 2603,2608	Providing and laying of dry Stone Masonry Work as per Drawing and Technical Specifications. <i>Unit = cum (For 5 cum)</i>		
		a) Labour Skilled	day	4.00
		Unskilled	day	8.00
26.2	2602, 2603,2608	Providing and laying of Random rubble stone Masonry in mud Mortar as per Drawing and Technical Specifications. <i>Unit = cum (For 5 cum)</i>		
		a) Labour Skilled	day	6.00
		Unskilled	day	12.00
		b) Material Stone	cum	5.75
		Mud (clay)	cum	2.00
26.3	2602, 2603,2607 A	Random Rubble Masonry		
		Providing and laying of Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications. <i>Unit = cum (For 5 cum)</i>		
		a) Labour Skilled	day	7.00
		Unskilled	day	14.00
		b) Material Stone	cum	5.75
		Cement	tonne	0.79
		Sand	cum	1.63
		Cost of water	KL	1.00
		c) Equipment Concrete mixer or other tools 5 % of Labour cost		
		B		Providing and laying of Stone Masonry Work in Cement Mortar 1:4 in Foundation complete as per Drawing and Technical Specifications. <i>Unit = cum (For 5 cum)</i>
a) Labour Skilled	day			7.00
Unskilled	day			14.00
a) Material Stone	cum			5.75

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
26.4	C		Cement	tonne	0.62
			Sand	cum	1.74
			Cost of water	KL	1.00
			c) Equipment		
			Concrete mixer or other tools 5 % of Labour cost		
			Providing and laying of Stone Masonry Work in Cement Mortar 1:6 in Foundation complete as per Drawing and Technical Specifications.		
			Unit = cum (For 5 cum)		
			a) Labour		
			Skilled	day	7.00
			Unskilled	day	14.00
b) Material					
Stone	cum	5.75			
Cement	tonne	0.45			
Sand	cum	2.08			
Cost of water	KL	1.00			
		Remarks:	If Concrete mixture is proposed to mix mortar provide concrete mixture 0.75 hr. and reduce 5 unskilled md on every 5 cum, in above specified value of item no 26.3.		
		2600	Providing and laying Stone Masonry work in cement mortar 1:3 in structure complete as per drawing and Technical Specifications		
	A	2607	Random Rubble Masonry Unit = cum (For 5 cum)		
			a) Labour		
			Skilled	day	7.00
			Unskilled	day	20.00
			b) Material		
			Stone	cum	5.75
			Cement	tonne	0.84
			Sand	cum	1.73
			Cost of water	KL	1.00
			Add 5 per cent of cost of Labour and material for scaffolding		
	B	2606	Coursed rubble Masonry (first sort) Unit = cum (For 5 cum)		
			a) Labour		
			Skilled	day	8.00
			Unskilled	day	22.00
			b) Material		
			Stone(sorted)	cum	5.75
			Cement	tonne	0.77
			Sand	cum	1.58
			Cost of water	KL	1.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity		
26.5	A	2600	Add 5 per cent of cost of Labour and material for scaffolding				
			Remarks:	If Concrete mixture is proposed to mix mortar provide concrete mixture 0.75 hr. and reduce 5 unskilled md on every 5 cum, in above specified value of item no 26.4.			
			2607	Providing and laying Stone Masonry work in cement mortar 1:4 in structure complete as per Drawing and Technical Specifications			
			2607	Random Rubble Masonry (coursed/uncoursed) Unit = cum (For 5 cum)			
			a) Labour				
			Skilled	day	7.00		
			Unskilled	day	20.00		
			b) Material				
			Stone	cum	5.75		
			Cement	tonne	0.66		
Sand	cum	1.85					
Cost of water	KL	1.00					
			Add 5 per cent of cost of Labour and material for scaffolding				
26.6	B	2606	Coursed rubble Masonry (first sort) Unit = cum (For 5 cum)				
			a) Labour				
			Skilled	day	8.00		
			Unskilled	day	22.00		
			b) Material				
			Stone(sorted)	cum	5.75		
			Cement	tonne	0.60		
			Sand	cum	1.68		
			Cost of water	KL	1.00		
						Add 5 per cent of cost of Labour and material for scaffolding	
26.6	A	2600	Providing and lying Stone Masonry work in cement mortar 1:6 in structure complete as per Drawing and Technical Specifications				
			2607	Random Rubble Masonry (coursed/uncoursed) Unit = cum (For 5 cum)			
			a) Labour				
			Skilled	day	7.00		
			Unskilled	day	20.00		
			b) Material				
			Stone	cum	5.75		
			Cement	tonne	0.48		

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Sand Cost of water Add 5 per cent of cost of Labour and material for scaffolding	cum KL	1.98 1.00
	B	2606	Coursed rubble Masonry (first sort) <i>Unit = cum (For 5 cum)</i> a) Labour Skilled Unskilled b) Material Stone (sorted) Cement Sand Cost of water Add 5 per cent of cost of Labour and material for scaffolding	day day cum tonne cum KL	8.00 22.00 5.75 0.44 1.80 1.00
		Remarks:	If Concrete mixture is proposed to mix mortar provide concrete mixture 0.75 hr. and reduce 5 unskilled md on every 5 cum, in above specified value of item no 26.6.		
26.7	A	2600	Providing and Pointing with cement mortar on masonry work in structure as per Technical Specifications cement mortar (1:3) <i>Unit = sqm (For 100 sqm)</i> a) Labour Skilled Unskilled b) Material Cement Sand Cost of water	day day tonne cum KL	9.00 9.00 0.31 0.63 0.05
	B		cement mortar (1:2) <i>Unit = sqm (For 100 sqm)</i> a) Labour Skilled Unskilled b) Material Cement Sand Cost of water	day day tonne cum KL	9.00 9.00 0.40 0.56 0.07
	C		Cement mortar (1:1) <i>Unit = sqm (For 100 sqm)</i>		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>a) Labour Skilled Unskilled</p> <p>b) Material Cement Sand Cost of water</p>	<p>day day tonne cum KL</p>	<p>9.00 9.00 0.61 0.42 0.10</p>
	Remarks:	<p>1. Scaffolding is already included in previous items of masonry works 2. If Concrete mixture is used to mix mortar provide concrete mixture for 0.75 hr. on every 100 sqm and reduce 1 unskilled md.</p>		

SECTION 2700 - REPAIR OF STRUCTURE

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
27.1	A	2712	Removal of existing cement concrete wearing coat including its disposal complete			
			Removal of existing cement concrete wearing coat including its disposal without causing any detrimental effect to any part of the bridge structure and removal of dismantled material complete as per Technical Specification			
			Unit = Sqm (For 75 mm thick, 100 sqm)			
			a) Labour			
			Skilled	day	1.00	
			Unskilled	day	12.00	
				b) Equipment		
				Tractor-trolley.	hour	6.00
				Drilling machine with bit and accessories	hour	6.00
		B	2712	Removal of existing cement concrete wearing coat including its disposal without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead complete as per Technical Specifications		
	Unit = cum (For 10 cum)					
	a) Labour					
Skilled	day			6.00		
Unskilled	day			60.00		
b) Equipment						
			Tractor-trolley.	hour	36.00	
			Drilling machine with bit and accessories	hour	36.00	
	C	2712	Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concert laid over 12 mm thick mastic asphalt including disposal with all lift and lead complete as per Technical Specification and Direction of the Engineer.			
Unit = Sqm (For 10 sqm)						
a) Labour						
Skilled			day	1.00		
Unskilled			day	10.00		
b) Equipment						
			Drilling machine with bit and accessories	hour	6.00	
			Tractor-trolley.	hour	6.00	
27.2		2710	Providing and application of gunite/shortcrete to repara e of damaged concrete section/ concrete covers on slab , girder ,beam etc with high early strength , low rebound sprayable thixotropic repair mortar mixed by machine, lead 30m (including 25% loss) average thickness of application-35 mm .			
			Unit = Sqm (For 50 sqm)			
			a) Labour			
			Skilled	day	2.00	
			Unskilled	day	20.00	

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.3	A	2710	b) Material Ready to use sprayable thixotropic repair mortar Cost of water Add 2 per cent of cost of material for consumables items.	kg KL	3720.00 2.00
			c) Equipment Air Compressor Shotcreteing equipment Concrifete mixture	hour hour hour	6.00 6.00 6.00
	B		Providing and application of Gunite/ Shotcrete concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specifications. Mix 1:3 (Cement and Coarse sand) Unit = Sqm (For 30 sqm)		
			a) Labour Skilled <i>Unskilled</i>	day day	2.00 6.00
			b) Material Cement Graded sand Cost of water Wire fabric (mesh 50 mm x 50 mm size of 3 mm wire) Accelerator compound for Guniting @ 2 per cent of weight of cement Add 2 per cent of cost of material for tied of welded wire fabric, consumables like nozzles, wire brush, clamping wire mesh etc.	tonne cum KL kg kg	0.66 1.41 1.00 60.00 13.26
			c) Equipment Compressor with Guniting equipment along with accessories Shotcreteing equipment	hour hour	6.00 6.00
			Mix 1:1:2 (Cement :sand: aggregate) Unit = Sqm (for 30 sqm, 40 mm thickness)		
			a) Labour Skilled Unskilled	day day	2.00 6.00
			b) Material Cement Graded sand Cost of water Aggregate (5 - 10 mm) Wire fabric (mesh 50 mm x 50 mm size of 3 mm wire) Accelerator compound for Guniting @ 2 per cent of weight of cement Add 2 per cent of cost of material for tied of welded wire fabric, consumables like nozzles, wire brush, clamping wire mesh etc.	tonne cum KL cum kg kg	0.66 0.47 1.00 0.94 60.00 13.26
			c) Equipment Compressor with Guniting equipment along with accessories Shotcreteing equipment	hour hour	6.00 6.00

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.4		2709	<p>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= nos. (For 1 Number)</p> <p>a) Labour Skilled Unskilled Add 10 per cent of Labour cost for drilling holes etc.</p> <p>b) Material Nipples Cement, fixing compound and consumables @ 15 per cent of cost of nipple</p>	day day nos.	0.20 0.04 1.00
27.5	A	2709	<p>Providing and Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical Specification. Cement Grout Unit = kg (For 50 kg)</p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Cement Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement</p> <p>c) Equipment Grout pump with agitator and accessories Generator</p>	day day kg hour hour	5.00 5.00 55.00 6.00 6.00
	B		<p>Cement Mortar (1:1) Grouting Unit = kg (For 50 kg)</p> <p>b) Labour Skilled Unskilled</p> <p>a) Material Cement Sand Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement</p> <p>c) Equipment Grout pump with agitator and accessories Generator</p>	day day kg kg hour hour	5.00 10.00 27.50 27.50 6.00 6.00
	C		<p>Low viscosity epoxy injection resin Unit = Lit (For 50 liter)</p>		

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.6	A	2700	a) Labour Skilled Unskilled b) Material Low viscosity Injection Epoxy Grout Epoxy primer Joint Sealant Compound (Epoxy Adhesive) c) Equipment Grout pump with agitator and accessories Generator	day day Lit kg kg hour hour	5.00 10.00 55.00 1.00 55.00 6.00 6.00
			Patching of damaged concrete surface with polymer concrete/ micro concrete and curing compounds Providing and applying polymer concrete and curing compounds on damaged concrete surface as per instructions of manufacturer and approval of the Engineer. Unit = sqm (for 10 sqm of 35 mm thick) a) Labour Skilled Unskilled b) Material Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter c) Equipment Grout pump with agitator and accessories Generator	day day kg hour hour	1.00 3.00 770.00 6.00 6.00
Remarks:			1. If thickness is other than 35 mm calculate required quantity of concrete by multiplying above quantity of material by suitable thickness factor or as per guideline of manufacturer/ direction of Engineer 2. 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.		
	B		Providing and applying Micro concreting on damaged concrete (slab/beam/abutment section of the bridges)with ready to use high early high strength , free flow , non shrink self compacting Micro concrete (M 60 & above)With adding 20% local aggregates of 10 mm down) as per instructions of manufacturer and approval of the Engineer. Unit = cum (For 1 cum) a) Labour Skilled Unskilled b) Material Non shrink self compacting micro concrete Local aggregates 10 mm down in size Epoxy Bonding Agent	day day kg cum kg	12.00 18.00 1936.00 0.20 12.00

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.7	C	Cost of water	KL	1.00
		c) Equipment		
		Concrete mixer	hour	1.00
		Generator	hour	1.00
		Providing and applying Micro concreting on damaged concrete (slab /beam/ abutment section of the bridges)with ready to use high early high strength , free flow , non shrink self compacting Micro concrete (M 60 & above) as per instructions of manufacturer and approval of the Engineer. <i>Unit = cum (For 1 cum)</i>		
		a) Labour		
		Skilled	day	12.00
		Unskilled	day	18.00
		b) Material		
		Non shrink self compacting micro concrete	kg	2285.00
		Epoxy Bonding Agent	kg	12.00
		Epoxy metal primer	kg	4.00
		Cost of water	KL	1.00
		c) Equipment		
		Concrete mixer	hour	6.00
Generator	hour	6.00		
27.8	2706	Providing and applying Epoxy adhesive and Sealing of crack / porous concrete with Epoxy Grout by injection with nipples complete as per direction of the Engineer. <i>Unit = kg (for 10 kg)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	2.00
		b) Material		
		Epoxy Adhesive	kg	11.00
		c) Equipment		
		Epoxy Injection gun	hour	6.00
		Generator	hour	6.00
27.8	2707	Providing and Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification <i>Unit = sqm (for 100 sqm, 10 mm thick epoxy)</i>		
		a) Labour		
		Skilled	day	5.00
		Unskilled	day	8.00
		b) Material		
		Epoxy bonding agent (@ 0.87 kg /sqm)	kg	87.00
		Epoxy mortar (@ 22kg / sqm)	kg	2200.00
Epoxy resin -hardener mix for seal coat.	kg	20.00		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Add 3 per cent cost of material for other consumables like acetone etc. to cover wastage.		
		c) Equipment		
		Air Compressor	hour	6.00
		Mortar mixer	hour	6.00
		Remarks:		
		In case of thickness more than 10 mm adjust rate as per thickness of mortar.		
27.9	2710	Providing and applying the Shotcrete mixture mechanically with compressed air under pressure, sprayable less rebound (rebound and quick setting comnd 25 %) as per Technical specifications and direction of the Engineer. unit: sqm (for 10 sqm 40 mm average thickness)		
		a) Labour		
		Skilled	day	0.10
		Unskilled	day	0.10
		b) Material		
		Thixotropic repair mortar (Sprayable)	kg	850.00
		Epoxy bonding agent	kg	8.70
		c) Equipment		
		Air compressor	hour	1.00
		Shotcreteing equipment	hour	1.00
		Generator	hour	6.00
27.10	2700	Providing and applying pre-packed cement based polymer mortar for replacement of spalled concrete Unit = sqm (For 10 sqm, 25 mm thick)		
		a) Labour		
		Skilled	day	2.00
		Unskilled	day	2.00
		b) Material		
		Epoxy bonding agent	kg	8.70
		polymer mortar M-45	kg	550.00
		c) Equipment		
		Compressor	hour	6.00
		Remarks:		
		In case of thickness other than 10 mm adjust rate as per thickness of mortar.		
27.11	2708	Providing and applying Epoxy bonding of new concrete to old concrete as per technical Specifications and direction of the Engineer. Unit = sqm (for 10 sqm)		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	1.00

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.12	2711	b) Material Epoxy resin	kg	8.40
		Providing and replacement of Bearings complete as per Technical Specification and direction of the Engineer. <i>Unit = nos. (For 3 no, span upto 30 m)</i>		
27.13	2711	a) Labour Skilled Unskilled	day day	5.00 12.00
		b) Material Bearing of required type and capacity Wooden packing	no cum	3.00 0.15
27.13	2711	c) Equipment Hydraulic Jack (40 tonne capacity)	hour	72.00
		Providing required parts and rectification of Bearings as per Technical Specifications and direction of the Engineer. <i>Unit = nos (for 3 no of bearing)</i>		
		Remarks: 1. The work entails replacement of all the bearings on one side of the span. 2. Traffic accommodation cost shall be seperately added if needed as per site condition. 3. This analysis is for Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30 m., for other method assume suitable values. 4. wooden packing may be used for 6 times.		
		Remarks: 1. The rectification of 3 bearings included in this analysis are on the same side of the span. 2. Traffic accommodation cost shall be seperately added if needed as per site condition. 3. This analysis is for Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30 m., for other method assume suitable values. 4. wooden packing may be used for 6 times.		
		a) Labour Skilled Unskilled	day day	5.00 12.00
		b) Material Parts of Bearing of required type and capacity Wooden packing	As per requirement cum	0.15
		c) Equipment Hydraulic Jack (required capacity normally 200 tonne)	hour	72.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.14	2700	<p>Providing and replacement of Expansion Joints complete as per drawings, Technical specifications and direction of the Engineer. <i>Unit = meter (for 12 meter)</i></p> <p>a) Labour For removal of old expansion joint including breaking of concrete, cutting of lugs and shifting of broken material etc.</p> <p>Skilled day 1.00 Unskilled day 9.00</p> <p>b) Material Epoxy @ 0.8 kg/sqm kg 9.6 * Concrete (select as per requirement) cum 2.4 * additional reinforcement kg 100*</p> <p>C) Replacement of joint expansion joint (Elastomeric Slab Steel Expansion Joint / compression seal/ strip / modular strip. etc.) meter 12.00</p>		
	Remarks:	<p>1. * select quantity as per design 2. The rate for the installation of new expansion joints shall be taken from chapter 19. Broken concrete will have to be replaced which has been included in this analysis. 3. the rate of Dismantling of concrete or wearing shall be adopted from item no 27.1, 27.2 4. The rate of new expansion joint (whole system) shall be adopted from chapter 19. 5. The rate of Concrete (Normal concrete / polymer concrete/ Micro concrete shall be adopted from Chapter 20 or chapter 27 above. 6. The rate of Reinforcement bar if any required shall be adopted from chapter 20 7. Traffic accommodation cost shall be seperately added if needed as per site condition.</p>		
27.15	2700	<p>Providing and replacement of Damaged Concrete Railing as per Drawing, Technical Specifications and direction of the Engineer,. <i>Unit = meter (For 30 meter)</i></p> <p>a) Labour Labour for dismantling old railing and disposal of dismantled material. Skilled day 1.00 Unskilled day 12.00</p> <p>b) Equipment Tractor-trolley for disposal of dismantled material hour 6.00</p>		
	Remarks:	The rate for the provision of new railing may be adopted from the chapter on superstructure.		
27.16	2700	<p>Providing and replacement of Crash Barrier as per Drawing, Technical Specifications and instruction of the Engineer. <i>Unit = meter (For 30 meter)</i></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.17	2700	a) Labour Labour for dismantling old railing and disposal of dismantled material. Skilled Unskilled	day day	1.00 20.00
		b) Equipment Tractor-trolley	hour	6.00
Remarks:		The rate for the construction of new crash barrier shall be adopted from Section 1500.		
27.17	2700	Providing and replacement of Damaged mild steel railing as per Drawing, Technical Specifications and direction of the Engineer. <i>Unit = meter (For 30 meter)</i>		
		a) Labour Labour for dismantling old railing and disposal of dismantled material. Skilled Unskilled	day day	1.00 12.00
27.17	2700	b) Equipment Tractor-trolley	hour	5.00
		Remarks:		The rate for the construction of new mild steel railing shall be adopted from Section 31.
27.18	2700	Repair of Crash Barrier Providing and repair of concrete crash barrier with cement concrete M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concert after erection of proper form work. <i>Unit = meter (For 30 meter)</i>		
		a) Labour Skilled Unskilled	day day	1.00 3.00
27.18	2700	b) Material M-30 grade cement concrete	cum	1.00
		Remarks:		1. It is assumed that damage is to the extent of 10 per cent of the volume of concrete .This will require 1 cum of concrete. If more volume is necessary adjust analysis accordingly.
27.19	2700	Repair of RCC Railing Providing and repair of RCC railing to bring it to the original shape as per Drawing, Technical Specifications and instruction of the Engineer. <i>Unit = meter (For 30 meter)</i>		
		a) Labour Skilled	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Unskilled	day	2.00
		b) Material		
		M-30 grade cement concrete	cum	0.30
		HYSD bar reinforcement	tonne	0.03
		Remarks:		
		1. It is assumed that damage is to the extent of 10 per cent of the volume of concrete. This will require 0.3 cum of concrete, if more volume is necessary adjust analysis accordingly.		
27.20	2700	Repair of Steel Railing Providing and repair of steel railing to bring it to the original shape as per Drawing, Technical Specifications and direction of the Engineer. <i>Unit = meter (For 30 meter)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	2.00
		b) Material		
		Mild steel ISMC series	kg	87.00
		Flat iron	kg	30.00
		MS Bolt and nuts	kg	30.00
		Add 5 per cent of cost of material for painting.		
		Remarks:		
		1. It is assumed that damage is to the extent of 10 per cent of the volume of concrete. This will require 0.3 cum of concrete, if more volume is necessary adjust analysis accordingly.		
27.21	2713	Painting of Steel Bridge Providing and painting steel bridge including removal of old paints by sand blasting cleaning and repairing of metal surfaces for the application of new paints as per specification and direction of the Engineer. <i>Unit = sqm (for 20 sqm)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	7.00
		b) Material		
		sand (1.7 mm - 600 micron)	cum	0.80
		c) Equipment		
		Air compressor	hour	6.00
		Blasting Machine	hour	6.00
27.22	2713	Providing and Painting of steel bridges with one coat of primer, one coat of epoxy and 2 coats of acrylic polyurethane as per specification. <i>Unit = sqm (for 20 sqm)</i>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>a) Labour Skilled (0.25+0.25+0.25 =1) Unskilled (1+1+1+1=4)</p> <p>b) Material i) Epoxy Red Zinc Oxide Phosphate Primer ii) 2 Pack high built epoxy iii) 2 Pack high built polyur - ethane (2 coat)</p> <p>c) Equipment Paint sprayer machine with compressor</p> <p>Atleast 4 days is necessary to complete painting on particular area. (other coat can applied only after drying of previous coat).</p>	day day lit lit lit hour	1.00 4.00 5.50 5.50 8.00 6.00
	Remarks			
27.23	2713	<p>Providing and painting of steel bridges with one coat of primer, one coat of epoxy and 2 coats of acrylic polyurethane, without sprayer machine as per specification <i>Unit = sqm (for 1 sqm)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material i) Epoxy Red Zinc Oxide Phosphate Primer ii) 2 Pack high built epoxy iii) 2 Pack high built polyur - ethane</p>	day day lit lit lit	0.60 0.60 0.25 0.25 0.35
27.24	2700	<p>Repair of Joint Grooves with Epoxy Mortar Providing and repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete as per Technical Specifications and direction of the Engineer. <i>Unit = meter (for 10 m)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Epoxy primer Epoxy compound with accessories for preparing epoxy mortar</p> <p>c) Equipment Air compressor</p>	day day kg kg hour	1.50 1.50 2.50 10.00 0.10
27.25	2700	<p>Repair of old Joints Sealant Providing and repair of old joints including removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material as per Drawing and Technical Specifications.</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.26	A	2700	<i>Unit = meter (For 10 m)</i>		
			a) Labour		
			Skilled	day	0.15
			Unskilled	day	1.50
			b) Material		
			Primer	kg	0.25
			Sealant	kg	1.00
			c) Equipment		
			Air compressor	hour	0.10
			Concrete Jacketing		
			Preparation, hacking and cleaning of existing surface for concrete jacketing as per direction of the Engineer.		
			<i>Unit = sqm (For 100 sqm)</i>		
			a) Labour		
			Skilled	day	3.00
			Unskilled	day	30.00
b) Equipment					
Hacking Machine	hour	6.00			
Generator	hour	6.00			
B					
Drilling Holes on existing concrete surface of 16 mm diameter and 300 mm depth					
Unit = nos. (for 100 number)					
a) Labour					
Skilled	day	1.00			
b) Equipment					
Jack hammer /Rock drill	hour	6.00			
Generator	hour	6.00			
Remarks					
		For other size (diameter and depth) of holes adjust rate as per volume basis.			
C					
Providing and fixing Anchor bar					
Unit = kg					
Refer Rate analysis of Reinforcement					
D					
Providing and Filling drill hole with Epoxy Grout					
Refer Rate analysis of Epoxy grout					
E					
Providing and applying Micro silica/ silica fume concreting for concrete jacketing works (slab /beam/ abutment section of the bridges) as per instructions of manufacturer and as approved by the Engineer.					
<i>Unit = cum (For 1 cum)</i>					
a) Labour					
Skilled	day	12.00			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
27.27	A	Unskilled	day	18.00	
		b) Material			
		Cement	kg	500.00	
		sand	cum	0.47	
		aggregate	cum	0.70	
		Micro silica/ Silica Fume	kg	50.00	
		PC based Super plasticizer	kg	7.50	
		Pozzoplus	kg	100.00	
		Cost of water	KL	1.00	
		c) Equipment			
	Concrete mixer	hour	1.00		
	Generator	hour	1.00		
	B	Corrosion Treatment of Rebar's			
		Providing accessories and removal of rust from exposed rebar area as per direction of the Engineer.			
		<i>Unit = sqm (For 100 sqm)</i>			
		a) Labour			
		Skilled	day	2.00	
		Unskilled	day	30.00	
		Wire brush, chisel, axe etc. , @5 % of Labour cost			
		Providing and Application of Rust Cleaning & passivating agent as per manufacturer' s guidelines and instruction of the Engineer.			
		<i>Unit = sqm (For 100 sqm)</i>			
		a) Labour			
	Skilled	day	1.00		
Unskilled	day	6.00			
b) Material					
Rust clean agent	kg	10.00			
c) Equipment					
Mechanical sprayer , @5 % of Labour cost					
C	Providing and Application of Alkaline, polymeric, elastomeric formulation designed to protect steel from corrosion as per manufacturer' s guidelines and instruction of the Engineer.				
	<i>Unit = sqm (For 100 sqm)</i>				
	a) Labour				
	Skilled	day	1.00		
	Unskilled	day	6.00		
	b) Material				
	Alkaline, polymeric, elastomeric primer agent	kg	12.50		
Cement	kg	10.00			
c) Equipment					
Mechanical sprayer , @5 % of Labour cost					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
27.28	D	<p>Providing and Application of Acrylic Based bond coat for reinforcement as per manufacturer' s guidelines and instruction of the Engineer. <i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 8.00</p> <p>b) Material Acrylic based bonding agent kg 50.00 Cement kg 50.00</p> <p>c) Equipment Mechanical sprayer @5 % of Labour cost</p>			
	E	<p>Providing and Application of Pre-packed polymer modified mortar as per manufacturer' s guidelines and instruction of the Engineer. Refer Item no 27.6</p>			
	F	<p>Providing and Application of concrete penetrating corrosion inhibitor as per manufacturer' s guidelines and instruction of the Engineer. <i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 8.00</p> <p>b) Material concrete penetrating corrosion inhibitor kg 25.00</p> <p>c) Equipment Mechanical sprayer @5 % of Labour cost</p>			
			<p>Providing and Application of 3 coat of high build micro porous anti carbonation coating on concrete surface as per manufacturer' s guidelines and instruction of the Engineer. <i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 20.00</p> <p>b) Material high build micro porous anti carbonation coat kg 50.00</p> <p>c) Equipment Mechanical sprayer @5 % of Labour cost</p>		
27.29	A	<p>Fiber Reinforced Polymer works Providing and Application of Fiber reinforced polymer (carbon fiber) as per manufacturer' s guidelines and instruction of the Engineer. <i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour</p>			

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.30	B	Skilled	day	2.00
		Unskilled	day	8.00
		b) Material		
		Carbon fiber	sqm	110.00
		Epoxy bonding agent	kg	100.00
		Providing and Application of carbon laminated (50 mm wide 1.4 mm thick) system as per manufacturer' s guidelines and instruction of the Engineer. Unit = meter (For 100 meter)		
	C	a) Labour		
		Skilled	day	2.00
		Unskilled	day	8.00
		b) Material		
		Carbon laminated sheet	sqm	110.00
		Laminate adhesive agent (thixotropic)	kg	20.00
27.31	2700	Providing and Application of 3 coat of two component aliphatic Polyurethane Coating on concrete surface as per manufacturer' s guidelines and instruction of the Engineer. Unit = sqm (For 100 sqm)		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	4.00
		b) Material		
		Two component aliphatic Polyurethane coat	kg	75.00
	2700	Repair of Gabion wall Providing and repair of spalled gabion box/ mattress including dressing bedding, bonding tying all as per Technical Specification direction of the Engineer. Unit = cum (10 cum)		
		a) Labour		
		Skilled	day	4.00
		Unskilled	day	16.00
		b) Material		
		Boulder	cum	12.00
Binding wire	kg	10.00		
Remarks:		1. It is assumed that damage is only loss of boulder from outer layer, if removal of existing gabion is necessary add dismantle component and if new gabion is necessary refer Section 2400.		
27.31	2700	Repair of masonry wall / side drain Providing and repair of spalled masonry wall/ side drain of random rubble masonry in cement mortar 1:4 as per Technical Specifications and direction of the Engineer.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><i>Unit = cum (5 cum)</i></p> <p>a) Labour Skilled day 10.00 Unskilled day 20.00</p> <p>b) Material Stone cum 7.50 Cement tonne 0.93 Sand cum 2.61 Cost of water KL 2.00</p> <p>Add for scaffolding @ 10 % of cost of Labour and material</p> <p>1. It is assumed that damage is less than 1 cum at a particular location, if quantity is more than 1 cum with in 5 m distance of repair location refer Section 2500.</p>		
		<p>Remarks:</p>		
27.32	2700	<p>Inspection and Re-tightening of Nut bolt and other accessories</p> <p>Inspection and Re-tightening of Nut bolt and other accessories of Cables/ Structural parts/Steel truss/ steel girder as per Technical Specifications and direction of the Engineer.</p> <p><i>Unit = nos (For 500 nos)</i></p> <p>a) Labour Skilled day 2.00 Unskilled day 10.00</p> <p>b) Material Nut bolt nos (as per requirement) Bamboos nos 8.00 Dori kg 8.00</p> <p>c) Equipment Bridge Inspection vehicle hour 6.00 Other tools, safety belt and other accessories @ 5 % of Labour cost</p> <p>1. Traffic accommodation cost shall be seperately added if needed as per site condition. 2. if Inspection vehicle is proposed , Bamboos and Dori shall not be used and output shall be 1000 nos bolts instead of 500 nos.</p>		
		<p>Remarks:</p>		
		<p>Remarks for section 279</p> <p>For all Repair / maintenance items add cost for mobilization and demobilization of Equipment based on site location as a separate item in contract. For all Repair / maintenance items add cost for traffic accommodation / diversion , if required, provide as a separate item in contract.</p>		

SECTION 2800 - BIO ENGINEERING WORKS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.1	A	2802	Collection and preparation of seeds		
			Collection of grass seeds from sources within 1 km of the road, including separating and preparing seed for storage, and drying seed in the sun.		
			<i>Unit = Kg (For 1 Kg)</i>		
			a) Labour		
			Unskilled	day	1.50
	b) Material				
	Sealed bag	nos	1.00		
	c) Equipment				
	Add 3 % of Labour cost for Khukuri and other T&P				
	B		Collection of large shrub seeds (e.g. bhujetro from sources within 1 km of the road including seed preparation for storage after drying.		
			<i>Unit = Kg (For 1 Kg)</i>		
		a) Labour			
	Unskilled	day	0.45		
	C		Collection of medium-sized shrub seeds (e.g. Keraukose) from sources within 1 km of the road, including seed preparation for storage after drying.		
			<i>Unit = Kg</i>		
a) Labour					
Unskilled		day	0.75		
b) Material					
Sealed bag	nos	1.00			
D		Collection of medium-sized shrub and tree seeds (e.g. areli, khayer, ghobre and rani salla, sisau) from sources within 1 km of the road, including seed preparation for storage after drying.			
		<i>Unit = Kg (For 1 Kg)</i>			
	a) Labour				
	Unskilled	day	0.95		
	b) Material				
	Sealed bag	nos	1.00		
E		Collection of small shrub and tree seeds (e.g. Dhanyero, dhusun, tilka, utis) from the sources within 1 km of the of the road, including seed preparation for storage after drying.			
		<i>Unit = Kg (For 1 Kg)</i>			
	a) Labour				
Unskilled	day	2.50			
b) Material					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.02	A	2803	Sealed bag	nos	1.00
			c) Equipment Add 3 % of Labour cost for Nanglo and other T&P		
			Collection of grass and hardwood cuttings for vegetative propagation Collection of grass clumps (e.g. amliso, kans, khar) from sources within 1 km of the road to make slips for multiplication in the nursery. <i>Unit = slips (For 100 slips)</i>		
			a) Labour Unskilled	day	1.50
			b) Material Adequate supply of appropriate clumps Hessian jute	sqm	5.00
			c) Equipment Add 3 % of Labour cost for Kodalo and other T&P		
			Collection of cuttings of small bamboos (e.g. padang bans, tite nigalo bans), suitable for traditional planting, from the sources within of the road. Material minimum 10 cm of the rooted rhizome and 90 cm of culm. <i>Unit = slips (For 100 slips)</i>		
			a) Labour Unskilled	day	3.00
			b) Material Adequate supply of appropriate clumps Hessian jute	sqm	10.00
			c) Equipment Add 3 % of Labour cost for Kodalo , Khukuri and other T&P		
28.03	C	2804	Collection of hardwood cuttings (e.g. assuro, basin, kanda phul, namdi phul, saruwa, simali) , from the sources within of the road of the road. Material minimum 30 cm in length and 2 cm in dia. <i>Unit = slips (For 100 slips)</i>		
			a) Labour Unskilled	day	0.85
			b) Material Adequate supply of appropriate clumps Hessian jute	sqm	5.00
			c) Equipment Add 3 % of Labour cost for Khukuri and other T&P		
			Nursery operation and management (bed preparation)		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	A	Construction of seed beds for tree seedlings, including Materials for beds and shades. Bed is 1 m wide x 17 cm high and made up of 5 cm of washed gravel, 5 cm of unsieved forest soil, 5 cm of 1:3 mix of sieved forest soil, and washed sand, 2 cm of washed, sieved and sterilized sand. [Add 5% to the number of bricks to allow for normal wastage]. <i>Unit = sqm (For 5 sqm)</i>		
		a) Labour		
		Skilled	day	1.50
		Unskilled	day	0.85
		b) Material		
		Bamboo poles	nos	9.00
		Polyethene Sheet	sqm	9.00
		Bricks	nos	96.00
		Gravel	cum	0.25
		Unsieved Soil	cum	0.10
	Line String	meter	13.00	
	Binding wire	kg	3.00	
	c) Equipment			
	Add 3 % of Labour cost for Khanti, Shovel, Pick axe, Screen, mesh and other T&P			
	B	Construction of stand out beds for tree seedling in polypots, including Material for beds and shades. Bed is 100 cm wide x 15 cm high, with a layer of gravel placed above the compacted ground. [Add 5% to the number of bricks to allow for normal wastages.] <i>Unit = sqm (For 5 sqm)</i>		
		a) Labour		
		Unskilled	day	6.00
		b) Material		
		Bamboo poles	nos	15.00
		Bricks	nos	96.00
		Gravel	cum	0.25
Line String		meter	13.00	
Binding wire		kg	3.00	
c) Equipment				
Add 3 % of Labour cost for Khanti, Shovel, Pick axe and other T&P				
C	Construction of beds for grass seeds, grass slips (i.e. vegetative propagation) and tree cuttings, including Materials and hessian cover. Bed is 100 cm wide x 25 cm high and made up of of washed gravel placed above the ground, of 1:1 mix of sieved soil and compost, and topped with 15 cm of 3:1 mix of sieved forest topsoil and washed sand. <i>Unit = sqm (For 5 sqm)</i>			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.04	D		a) Labour Skilled Unskilled b) Material Gravel Forest soil Compost Washed sand Hessian Jute c) Equipment Add 3 % of Labour cost for Shovel, Pick axe and other T&P	day day cum cum cum cum sqm	1.00 1.50 0.38 1.46 0.38 6.00 10.00
			Construction of beds for propagation of bamboo culm cuttings, including Materials and hessian cover. Bed is 100 cm wide x 30 cm high. The ground below the bed is dug to a depth of 30 cm. Bed is made with 10 cm unsieved soil and 20 cm high is formed around the edge. <i>Unit = sqm (For 5 sqm)</i>		
	A	2804	Nursery operation and management (seed sowing and transplanting; planting hardwood cuttings) Tree seed sowing @ 10 gram per sqm. (medium sized seeds) or 2 gram per sqm (very fine seeds) into seed beds including pre-sowing treatment. <i>Unit = sqm (For 5 sqm)</i> a) Labour Unskilled b) Material Seed c) Equipment Add 3 % of Labour cost for Bowl, Trowel and other T&P	day cum	0.04 0.38
	B		Preparing potting mix and filling polypots, including all Materials for container seedlings. [Note. 1 kg of 200 gauge polypots (4" x 7" laid flat)= 464 bags; 200 gauge black polythene is preferred] <i>Unit = nos. (For 1000 nos.)</i>		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p>a) Labour Unskilled</p> <p>b) Material Polypots Sand Soil Compost</p> <p>c) Equipment Add 3 % of Labour cost for Wooden peg and other T&P</p>	<p>day</p> <p>nos cum cum cum</p>	<p>10.00</p> <p>1050.00 0.46 0.70 0.23</p>
	C	<p>Direct sowing of tree seeds into polypots including seed treatment, by sowing one seed in half the pots and two seeds in the other half. <i>Unit = nos. (For 1000 nos.)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Seed Wooden peg</p> <p>c) Equipment Add 3 % of Labour cost for Sieve, Shovel and other T&P</p>	<p>day</p> <p>nos nos</p>	<p>0.62</p> <p>1500.00 1.00</p>
	D	<p>Pricking out young seedling and transplanting into polypots. <i>Unit = nos. (For 1000 nos.)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Wooden peg</p> <p>c) Equipment Add 3 % of Labour cost for Tray and other T&P</p>	<p>day</p> <p>nos</p>	<p>0.18</p> <p>1.00</p>
	E	<p>Pricking out young seedling and transplanting into beds. <i>Unit = nos. (For 1000 nos.)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Wooden peg</p> <p>c) Equipment Add 3 % of Labour cost for Tray and other T&P</p>	<p>day</p> <p>nos</p>	<p>0.12</p> <p>1.00</p>
	F	<p>Transplanting grass slips into beds, from clumps. Slips are planted at 10 cm centers in row 25 cm apart. <i>Unit = sqm m</i></p> <p>a) Labour Unskilled</p>	<p>day</p>	<p>0.12</p>

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.05	G	2805	b) Material Hessian Jute	sqm	0.30
			c) Equipment Add 3 % of Labour cost for Khukuri , Shovel and other T&P		
			Planting of hardwood cuttings of minimum length to 20 cm depth into prepared beds. Cutting spaced at centers within rows, with 20 cm between rows. <i>Unit = nos. (For 1000 nos.)</i>		
			a) Labour Unskilled	day	0.60
			b) Material Hard wood cuttings	nos	1000.00
			c) Equipment Add 3 % of Labour cost for Khanti and other T&P		
	A	2805	Preparation of raised Materials for extraction from the nursery Grass culm cutting production from nursery stock: single or double node (e.g. napier) <i>Unit = nos. (For 1000 nos.)</i>		
			a) Labour Unskilled	day	0.70
			b) Material Hessian Jute	sqm	2.70
	B	2805	c) Equipment Add 3 % of Labour cost for Khukuri and other T&P		
			Uprooting and preparing grass slips ready for site planting from nursery seedling. <i>Unit = nos. (For 1000 nos.)</i>		
			a) Labour Unskilled	day	0.63
C	2805	b) Material Hessian Jute	sqm	1.35	
		c) Equipment Add 3 % of Labour cost for Fork, Pick axe Khukuri and other T&P			
		Uprooting and preparing grass slips ready for site planting from nursery grass clumps raised from slips by vegetative propagation. <i>Unit = nos. (For 1000 nos.)</i>			
C	2805	a) Labour Unskilled	day	0.33	
		b) Material Hessian Jute	sqm	4.20	
		c) Equipment Add 3 % of Labour cost for Shovel and other T&P			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.6	A	2805	<p>Compost and mulch production</p> <p>Mulch production by collection and cutting of weeds and other vegetation such as tite pati, banmara etc., within 1 km of the road, and stacking along roadside. <i>Unit = cum (For 1 cum)</i></p> <p>a) Labour Unskilled</p> <p>b) Material</p> <p>c) Equipment Add 3 % of Labour cost for Hansia, Doko and other T & P</p>	day	0.12
	B		<p>Compost production by collection and cutting of weeds and other vegetation such as tite pati, banmara etc., within 1 km of the road, including fine cutting and filling compost pit. <i>Unit = cum (For 1 cum)</i></p> <p>a) Labour Unskilled</p> <p>b) Material</p> <p>c) Equipment Add 3 % of Labour cost for Hansia, Doko and other T & P</p>	day	0.12
	C		<p>Turning compost once per month. <i>Unit = cum (For 1 cum)</i></p> <p>a) Labour Unskilled</p> <p>b) Material</p> <p>c) Equipment Add 3 % of Labour cost for Shovel and other T & P</p>	day	0.10
28.7	A	2807	<p>Direct seedling on site</p> <p>Broadcasting grass seeds on slopes <40°; seedling rate 25 g per sqm. <i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Seed</p>	day	0.17
	B		<p>Broadcasting grass seeds on slopes <40° ;including cover with long mulch, seedling rate 25 g per sqm. <i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Seed Mulch</p>	day kg cum	5.00 2.50 5.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.08	C		<p>Broadcasting grass seeds on slopes <40-45* including cover with long mulch, and jute netting of mesh size 300 mm * 500 mm. Seedling @25 g per sqm. Operation includes pegging with suitable live pegs or hardwood cutting (e.g. Simali) 1 m spacing, jute net of 6.75 m* size.</p> <p><i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Seed Mulch Jute net Live pegs</p> <p>c) Equipment Add 3 % of Labour cost for Khukuri, Mallet and other T & P</p>	day	6.25
	D		<p>Sowing shrub or tree seeds on all slopes at 25 cm intervals, including digging planting holes to 5 cm depth and covering with soil. Two seeds per planting hole.</p> <p><i>Unit = sqm (For 100 sqm)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Seed</p> <p>c) Equipment Add 3 % of Labour cost for MS rod of 50 cm length and other T & P</p>	day	1.00
	A	2807	<p>Planting grass on site</p> <p>Planting single node culm cutting of grass (e.g. napier) on fill slopes<45 and embankment slopes in plain areas. Approx. length 15-, including digging planting hole 10 - 20 cm depth using a metal rod or hardwood peg.</p> <p><i>Unit = nos. (For 100 nos.)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Grass Cuttings Hessian Jute</p> <p>c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P</p>	day	0.20
	B		<p>Planting single node culm cutting of grass (e.g. napier) on fill slopes<45° Approx. length 15-, including digging planting hole 10- depth using a metal rod or hardwood peg.</p>	nos	100.00
				sqm	0.27

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><i>Unit = nos. (For 100 nos.)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Grass Cuttings Hessian Jute</p> <p>c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P</p>	day nos sqm	0.35 100.00 0.27
	C	<p>Planting single node culm cutting of grass (e.g. napier) on fill slopes >45° Approx. length 15-, including digging planting hole 10- depth using a metal rod or hardwood peg.</p> <p><i>Unit = nos. (For 100 nos.)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Grass Cuttings Hessian Jute</p> <p>c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P</p>	day nos sqm	0.50 100.00 0.27
	D	<p>Planting rooted grass slips on embankment slopes in plain areas, at spacing within the row. The first row is 0.75 m from the edge of the pavement and subsequent rows are spaced at intervals down the embankment.</p> <p><i>Unit = meter (For 1 meter)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Grass slips/ no of drills Cuttings Hessian Jute Line string</p> <p>c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P</p>	day nos sqm m	0.02 11.00 0.27 1.00
	E	<p>Planting rooted grass slips on the slopes <45° including preparation of slips on site. a max of 5 cm depth with metal rod or Operation includes digging planting hole to hard-wood peg, depending on the nature of the soil. The planting drills should be space</p> <p><i>Unit = sqm (For 1 sqm)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Grass slips/ no of drills Cuttings Hessian Jute</p>	day nos sqm	0.20 100.00 0.27

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
28.9	F		c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P			
			Planting rooted grass slips on the slopes 45° - 60° including preparation of slips on site. a max of 5 cm depth with metal rod or Operation includes digging planting hole to hard-wood peg, depending on the nature of the soil. The planting drills should be space <i>Unit = sqm (For 1 sqm)</i>			
			a) Labour Unskilled	day	0.30	
			b) Material Grass slips/ no of drills Cuttings	nos	100.00	
			Hessian Jute	sqm	0.27	
			c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P			
	G			Planting rooted grass slips on the slopes > 60° including preparation of slips on site. a max of 5 cm depth with metal rod or Operation includes digging planting hole to hard-wood peg, depending on the nature of the soil. The planting drills should be space <i>Unit = sqm (For 1 sqm)</i>		
				a) Labour Unskilled	day	0.40
				b) Material Grass slips/ no of drills Cuttings	nos	100.00
				Hessian Jute	sqm	0.27
				c) Equipment Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P		
A	2807		Planting shrub and tree seedling and cutting on site Planting containerized tree and shrub seedlings, including pitting, transplanting, composting and placing tree guards, on toe of embankment slopes in plain areas, not less than 8 m from the road center line. Pit size 30 cm diameter x depth. Compost volume 1/4 of the volume of the pit, mixed with original soil. <i>Unit = nos. (For 10 nos)</i>			
			a) Labour Unskilled	day	0.25	
			b) Material Seedling	nos	10.00	
			Compost	cum	0.05	
			Tree guard	nos	10.00	
			Green mulch	cum	0.04	
c) Equipment Add 3 % of Labour cost for Khanti Mallet and other T&P						

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	B	<p>Planting containerized tree and shrub seedlings, including pitting, transplanting, composting and mulching, on slopes < 30° Pit size 30 cm diameter x depth mix Compost with soil and back fill into pit to 1/4 of the pit volume <i>Unit = nos. (For 10 nos.)</i></p> <p>a) Labour Unskilled</p>	day	0.33
		<p>b) Material Seedling</p>	nos	10.00
		<p>Compost</p>	cum	0.05
		<p>Green mulch</p>	cum	0.04
		<p>c) Equipment Add 3 % of Labour cost for Khanti Doko and other T&P</p>		
	C	<p>Planting containerized tree and shrub seedlings, including pitting, transplanting, composting and mulching, on slopes 30° - 40° Pit size 30 cm diameter x depth mix Compost with soil and back fill into pit to 1/4 of the pit volume <i>Unit = nos. (For 10 nos.)</i></p> <p>a) Labour Unskilled</p>	day	0.40
		<p>b) Material Seedling</p>	nos	10.00
		<p>Compost</p>	cum	0.05
		<p>Green mulch</p>	cum	0.04
		<p>c) Equipment Add 3 % of Labour cost for Khanti Doko and other T&P</p>		
	D	<p>Planting rooted tree stump cutting and bare root seedlings, including pitting, transplanting, composting and mulching on slopes <30°. Pit size 10 cm diameter x depth. Compost volume 1/4 of volume of the pit mix with original soil. <i>Unit = nos. (For 10 nos.)</i></p> <p>a) Labour Unskilled</p>	day	0.17
<p>b) Material Seedling</p>		nos	10.00	
<p>Compost</p>		cum	0.03	
<p>Green mulch</p>		cum	0.04	
<p>c) Equipment Add 3 % of Labour cost for Khanti Doko and other T&P</p>				

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
28.10	E		Planting rooted tree stump cutting and bare root seedlings, including pitting, transplanting, composting and mulching on slopes <math> < 30^{\circ} - 45^{\circ}</math> Pit size 10 cm diameter x depth. Compost volume 1/4 of volume of the pit mix with original soil. <i>Unit = nos. (For 10 nos)</i>			
			a) Labour Unskilled	day	0.25	
			b) Material Seedling	nos	10.00	
			Compost	cum	0.03	
			Green mulch	cum	0.04	
			c) Equipment Add 3 % of Labour cost for Khanti Doko and other T&P			
	F			Planting rooted tree stump cutting and bare root seedlings, including pitting, transplanting, composting and mulching on slopes > 45° Pit size 10 cm diameter x depth. Compost volume 1/4 of volume of the pit mix with original soil. <i>Unit = nos. (For 10 nos.)</i>		
				a) Labour Unskilled	day	0.33
				b) Material Seedling	nos	10.00
				Compost	cum	0.03
				Green mulch	cum	0.04
				c) Equipment Add 3 % of Labour cost for Khanti Doko and other T&P		
A		2897	Vegetative palisade construction, brush layering and fascines Collection of hardwood for cuttings for planting Material (e.g. assuro, namdi phul, simali)from the sources within of the road. Material to be approx. 1 km in length and minimum 5 cm in diameter. <i>Unit = nos. (For 1000 nos.)</i>			
			a) Labour Unskilled	day	0.85	
B			Preparation and planting of live pegs selected species(e.g. assuro, namdi phul, simali)of minimum length to 0.5 m depth into hard ground. Pegs spaced at centers within rows, and interwoven with vegetation.			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><i>Unit = meter (For 1 meter)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Live peg</p> <p>c) Equipment Add 3 % of Labour cost for Crowbar and other T&P</p>	day nos	0.17 20.00
	C	<p>Preparation and planting of live pegs selected species(e.g. assuro, namdi phul, simali)of minimum length to 0.5 m depth into soft debris. Pegs spaced at 5- centers within rows, and interwoven with vegetation.</p> <p><i>Unit = meter (For 1 meter)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Live peg</p> <p>c) Equipment Add 3 % of Labour cost for Crowbar and other T&P</p>	day nos	0.12 20.00
	D	<p>Site preparation for fascine laying: earth works in excavation of trench to 20 cm depth</p> <p><i>Unit = meter (For 1 meter)</i></p> <p>a) Labour Unskilled</p> <p>b) Material</p> <p>c) Equipment Add 3 % of Labour cost for Pick Axe, Shovel Crowbar and other T&P</p>	day	0.06
	E	<p>Laying of live fascines, using live hardwood cuttings of selected species(e.g. assuro, namdi phul, simali) of minimum length placed in bundles to give 4 running meters of cutting per meter of fascine, including backfilling of trench and careful compaction.</p> <p><i>Unit = meter (For 1 meter)</i></p> <p>a) Labour Unskilled</p> <p>b) Material Hard wood cutting of at least 1 m length</p> <p>c) Equipment Add 3 % of Labour cost for Crowbar and other T&P</p>	day m	0.17 8.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.11	A	2808	Jute netting works		
			Standard jute netting for bare slopes and under planting with slips. Spinning raw jute from 100% jute fiber into yarn and weaving the yarn into netting. Hand spun yarn 5 to 8 mm in diameter, width of net 1.20 meters warp strands 27 no per , mesh size 30-40 mm sq. and 1.25 kg/m weight at 1.20 m width.[Note A Toro is the weaving shuttle, bamboo culm.]normally made from a split large		
			Unit = sqm (For 1 sqm)		
			a) Labour		
	Unskilled	day	0.36		
	b) Material				
	Raw Jute	kg	0.25		
	c) Equipment				
	Add 3 % of Labour cost for bamboo 10 no sticks, Khukuri and other T&P				
	B	2808	Wide mesh jute netting for holding mulch on slopes. Spinning raw jute from 100% jute fiber into yarn and weaving the yarn into netting. Hand spun yarn 3 to 5 mm in diameter 1.20 m side and 11.2 m long. Mesh size 150 mm x 500 mm rectangular mesh and 0.25 kg/m at 1.20 m width. [Note A torso is the weaving shuttle, normally made from a split large bamboo culm.]		
			Unit = sqm (For 1 sqm)		
			a) Labour		
Unskilled			day	0.15	
b) Material					
Raw Jute	kg	0.25			
c) Equipment					
Add 3 % of Labour cost for bamboo 10 no sticks, Khukuri and other T&P					
C	2808	Placing 30-40 mm square mesh jute netting on bare slopes (for later under planting with grass slips), including pegging with live hardwood cutting or split bamboo pegs and loosening tension so that the net hugs the slope throughout.			
		Unit = sqm (For 1 sqm)			
		a) Labour			
		Unskilled	day	0.15	
b) Material					
Woven Jute	sqm	0.25			
Hardwood Cuttings or split bamboo pegs	nos	5.00			
c) Equipment					
Add 3 % of Labour cost for Ms rod, Mallet and other T&P					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.12	D		Placing 150 x 500 mm mesh jute netting to hold mulch on slopes, including application of mulch and pegging with live hardwood cutting or split bamboo pegs and loosening tension so that the net hugs the slope throughout.		
			<i>Unit = sqm (For 1 sqm)</i>		
			a) Labour Unskilled	day	0.10
	A	2809	b) Material Woven Jute cut mulch	sqm cum	1.00 0.05
			c) Equipment Add 3 % of Labour cost for Ms rod, Mallet and other T&P		
			Gabion bolster cylinders Providing and laying 60 cm dia gabion bolsters panels: 70 x 100 mm hexagonal mesh wire (10 swg frame and 12 Swg mesh) including Earthwork excavation filling with boulder, back filling all complete as per Drawing and Technical Specifications. <i>Unit = meter (For 1 meter)</i>		
	B		a) Labour Unskilled	day	0.82
			b) Material GI wire Black Polythene	Kg sqm	4.00 0.80
			c) Equipment Add 3 % of Labour cost for Pick Axe, Shovel and other T&P		
	C		Providing and laying 30 cm dia gabion bolsters panels: 70 x 100mm hexagonal mesh wire (10 swg frame and 12 Swg mesh) including Earthwork excavation filling with boulder, back filling all complete as per Drawing and Technical Specifications. <i>Unit = meter (For 1 meter)</i>		
			a) Labour Skilled	day	0.55
			b) Material GI wire Boulder/ Stone Black Polythene	Kg cum sqm	2.00 0.09 0.40
			c) Equipment Add 3 % of Labour cost for Gabion frame and other T&P		
			Anchoring bolster: 12 mm dia MS re-bar cut into 2 m lengths for anchorage and placed at intervals <i>Unit = meter (For 1 meter)</i>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity		
28.13	D	2810	a) Labour Unskilled	day	0.36		
			b) Material MS rod	m	2.00		
			c) Equipment Add 3 % of Labour cost for Sledge hammer and other T&P				
			Providing and laying of terram paper (geotextile) <i>Unit = meter (For 1 m)</i>				
			a) Labour Unskilled	day	0.36		
	A	2810	b) Material Terram paper	sqm	1.15		
			c) Equipment Add 3 % of Labour cost for Sledge hammer and other T&P				
			Bamboo tree guards Providing and weaving bamboo tree guards using bamboo poles as uprights: 1.60 m in height ; and weaving split bamboo with the outer wall intact around the posts. Dimension of the guard are 0.60 m diameter x 1.30 high.				
			<i>Unit = meter (For 1 meter)</i>				
			a) Labour Unskilled	day	0.36		
28.14	A	2812	b) Material Bamboo	meter	2.20		
			c) Equipment Add 3 % of Labour cost for Sledge hammer and other T&P				
			Turfing Grass sodding works including sod cutting , transporting , placing in position and water sprinkling (Lead upto 10 m).				
			<i>Unit = sqm (For 1 sqm)</i>				
			a) Labour Unskilled	day	0.05		
	B	2812	b) Equipment Add 3 % of Labour cost for Sledge hammer and other T&P				
			Providing and Spreading manure on the grass turf. <i>Unit = sqm (For 100 sqm)</i>				
			a) Labour Unskilled	day	0.04		
			b) Material Chemical manures	kg	7.00		
			c) Equipment				

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
28.15	C	Add 3 % of Labour cost for Sledge hammer and other T&P		
		Turfing with Sods Providing, furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of sods and watering. <i>Unit = sqm (For 10 sqm)</i>		
		a) Labour		
		Skilled	day	0.12
		Unskilled	day	3.00
		b) Equipment		
		Tractor-trolley	hour	1.00
		c) Material		
		Farm yard manure	cum	0.18
		Cost of water	KL	12.00
	D	Seeding and Mulching Providing required material, Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 liters per sqm and laying and fixing jute netting, including watering for 3 months all as per specification <i>Unit = sqm for (240 sqm)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	10.00
		b) Equipment		
		Tractor-trolley	hour	2.40
		c) Material		
		Seeds	kg	3.60
		Sludge/Farm yard manure	cum	0.43
		Bitumen Emulsion	liter	55.20
Jute netting, open weave, 2.5 cm square opening	sqm	264.00		
Cost of water for 3 months	KL	84.00		
28.15	2812	Spreading of Sludge Farm Yard Manure or/and good Earth Providing and Spreading of sludge farm yard manure or/and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately) <i>Unit = cum (For 15 cum)</i>		
		a) Labour		
		Skilled	day	0.04
Unskilled	day	1.00		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.16	(i)	2812	Grassing with ' Doobs' Grass Providing and grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed <i>Unit = sqm (For 500 sqm)</i>		
			In rows 15 cm apart in either direction a) Labour Skilled day 1.00 Unskilled day 10.00 b) Material Doob grass kg 500.00		
	(ii)		In rows 7.5 cm apart in either direction a) Labour Skilled day 2.00 Unskilled day 14.00 b) Equipment Water tanker hour 6.00 c) Material Doob grass kg 1000.00		
			Remarks: In the case of horticulture one skilled has been provided for every 10 Unskilled as maintenance of grass and plants require more care.		
28.17		2812	Making Lawns including Ploughing and Dragging Providing and making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying Doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm <i>Unit = sqm (For 1000 sqm)</i>		
			a) Labour Skilled day 2.00 Unskilled day 15.00 b) Equipment Tractor with tiller hour 6.00 c) Material manure cum 1.80 Fine grass kg 1000.00		
28.18		2811	Maintenance of Lawns or Turfing of Slopes Regular Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc. <i>Unit = sqm (For 100 sqm)</i>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.19		2812	a) Labour Unskilled (Mali)	day	10.00
			b) Equipment c) Material Cost of water	KL	90.00
28.20		2811	Turfing Lawns with Fine Grassing including Ploughing, Dressing Providing and Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying Doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 sqm		
			<i>Unit = sqm (for 1000 sqm)</i>		
			a) Labour Skilled	day	3.00
			Unskilled	day	30.00
			b) Equipment Tractor with tiller	hour	6.00
			c) Material Manure	cum	6.00
	Fine grass	kg	1000.00		
28.21	(a)	2807	Maintenance of Lawns with Fine Grassing for the First Year Regular Maintenance of lawns with fine grassing for the first year including watering etc.		
			<i>Unit = sqm (For 100 sqm)</i>		
			a) Labour Unskilled (Mali)	day	10.00
		b) Material Cost of water	KL	60.00	
28.21	(a)	2807	Planting and Maintaining of Permanent Hedges Planting permanent hedges including digging of trenches		
			Providing and Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart		
			<i>Unit = meter (For 100 meter)</i>		
			a) Labour Skilled	day	1.00
			Unskilled	day	14.00
		b) Material Hedge plants	nos	2x340	

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity		
28.22	(b)	Manure	cum	4.67		
		Pesticide	kg	0.25		
		Cost of water	KL	3.00		
		Maintenance of hedge for one year				
		<i>Unit = meter (For 100 m)</i>				
		a) Labour				
		Skilled	day	3.00		
		Unskilled	day	30.00		
		b) Material				
		Manure	cum	2.00		
	Pesticide	kg	0.50			
	Cost of water	KL	30.00			
	Hedge plants	nos	68.00			
	(a)	2807	Planting and Maintaining of Flowering Plants and Shrubs			
			Providing and planting flowering plants and shrubs in central verge (200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3 m and above.)			
			<i>Unit = meter (For 1000 m)</i>			
			a) Labour			
			Skilled	day	2.00	
			Unskilled	day	12.00	
			b) Material			
Plants			nos	200.00		
Shrubs			nos	800.00		
Manure sludge/Farm yard manure			cum	63.64		
Pesticide	kg	0.50				
Cost of water	KL	36.00				
(b)	2807	Providing and Maintenance of flowering plants and shrubs in central verge for one year				
		<i>Unit = km (For one Km)</i>				
		a) Labour				
		Skilled	day	36.00		
		Unskilled	day	365.00		
		b) Material				
		Manure Sludge / farm yard manure at site	cum	10.00		
		Cost of water	KL	180.00		
		Replacement of casualties @ 10 per cent				
		Plants	nos	20.00		
Shrubs	nos	80.00				
Pesticides	kg	1.50				
28.23	2807	Planting of Trees and their Maintenance for one Year				

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
28.24	2811	Providing and Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year <i>Unit = nos. (For 10 nos.)</i>		
		a) Labour		
		Skilled	day	2.00
		Unskilled	day	17.00
		b) Material		
		Sapling 2 m high 25 mm dia	nos	10.00
		Farm yard manure	cum	0.94
Pesticide	kg	0.50		
Cost of water	KL	12.00		
28.25	2811	Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure <i>Unit = sqm (For 500 sqm)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	15.00
		b) Material		
Cost of water	KL	15.00		
28.25	2811	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground Providing and laying half brick circular tree guard, in 2nd class brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete <i>Unit = nos. (For 10 nos.)</i>		
		a) Labour		
		Skilled	day	3.00
		Unskilled	day	6.00
		b) Material		
		Brick	nos	2300.00
		Cement	tonne	0.10
Sand	cum	0.30		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
28.26	2811	<p>Edging with 2nd Class Bricks, Laid Dry Lengthwise Providing and edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres <i>Unit = meter (For 1000 meter)</i></p> <p>a) Labour Skilled Unskilled</p> <p>b) Material Brick</p>	day day nos	8.00 8.00 5000.00
28.27	2811	<p>Making Tree Guard 53 cm dia and 1.3 meter height as per Design from empty bitumen drums Providing and making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect <i>Unit = nos. (For 5 nos tree guard)</i></p> <p>a) Labour Skilled (Blacksmith) Unskilled</p> <p>b) Material Empty bitumen drum MS sheet 50 x 0.5 mm Rivets 6 mm dia and 10 mm in length</p>	day day nos kg nos	1.00 1.00 5.00 2.00 110.00
28.28	2811	<p>Making Tree Guard 53 cm dia and 2 meter height as per Design from empty bitumen drums Providing and making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects <i>Unit = nos. (For 5 nos. tree guard)</i></p> <p>a) Labour Skilled (Blacksmith) Unskilled</p> <p>b) Material Empty bitumen drum MS sheet 50 x 0.5 mm Rivets 6 mm dia and 10 mm in length MS plate 30 x 3 mm</p>	day day nos kg nos kg	1.00 1.00 5.00 2.00 250.00 6.50

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
28.29	2811	<p>Wrought Iron and Mild Steel Welded Work</p> <p>Providing Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately <i>Unit = kg (For 100 kg)</i></p> <p>a) Labour Skilled (Blacksmith/ welder) day 3.00 Unskilled day 3.00</p> <p>b) Material Angle, tees, channels etc. kg 105.00</p> <p>Add 5 per cent of cost of Material for welding rods and other welding accessories</p>		
28.30	2811	<p>Tree Guard with MS Iron</p> <p>Providing and fixing MS iron tree guard 60 cm dia and 2 meter high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects. <i>Unit = nos. (For 10 nos. tree guard)</i></p> <p>a) Labour Skilled (Blacksmith) day 3.00 Unskilled day 3.00</p> <p>b) Material MS iron 25 x 6 mm kg 192.00 MS iron 25 x 3 mm kg 96.00</p> <p>Add 5 per cent of cost of Material for riveting, bolting and welding accessories</p> <p>c) Equipment Tractor-trolley hour 6.00</p> <p>d) Painting Painting two coats including priming sqm 17.70</p>		
	Remarks:	<p>1 The items of excavation and concreting to be measured and paid separately as per design .</p> <p>2 . Rate of painting may be adopted from the chapter as Traffic signs.</p>		
28.31	2800	<p>Tree Guard with MS Angle Iron and Steel Wire</p> <p>Providing and fixing tree guard 0.60 meter square, 2.00 meter high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
28.32	2807	<i>Unit = nos. (For 10 nos.)</i>		
		a) Labour		
		Skilled (Blacksmith/ welder)	day	8.00
		Unskilled	day	8.00
		b) Material		
		MS angle 30 x 30 x 3 mm	kg	135.00
		MS iron 25 x 3 mm	kg	180.00
		Steel wire 3 mm dia	kg	60.00
		Add 5 per cent of cost of Material for riveting, bolting and welding accessories		
		c) Equipment		
		Tractor-trolley	hour	6.00
		d) Painting		
		Painting two coats including priming	sqm	1.50
		Compensatory Afforestation		
		Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering		
		<i>Unit = sqm (For 10,000 sqm)</i>		
		a) Labour		
		i) Planting		
		Skilled	day	3.00
		Unskilled	day	25.00
		ii) For Maintenance for one year		
		Skilled	day	5.00
		Unskilled	day	50.00
b) Equipment				
Dozer	hour	12.00		
c) Material				
Sapling 1 to 1.5 m high 2 cm dia stem	nos	319.00		
Decayed farm yard/sludge manure (planting)	cum	60.90		
Decayed farm yard/sludge manure (maintenance)	cum	4.00		
Pesticides for planting	kg	0.50		
Pesticides for maintenance	kg	1.50		
Cost of water	KL	18.00		
Remarks:		Cost of fencing to be provided as per size of plot and approved design, measured and paid separately		

SECTION 2900 - MAINTENANCE OF ROAD

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.1	A	2902	<p>Maintenance Carryout Routine (regular maintenance) of Black top/ Gravel road in plain area (Terai) as per Technical Specifications and direction of the Engineer, Unit = Km - day</p> <p>a) Labour Skilled day 0.05 Unskilled day 0.20</p> <p>b) Material fuel 5 % of Labour cost Training ARMP 1.7 % of Labour cost Insurance 1 % of Labour cost First aid 0.3 % of Labour cost</p> <p>c) Equipment Tools and plants 9 % of Labour cost Maintenance of tools 3 % of Labour cost</p> <p>1. In case of departmental Work provide fuel component 8 % 2. In case of more than two lane road add 20 % additional for each extra lane 3. For Routine maintenance of Bridge add 0.25 md per day for upto 100 m length of bridge and additional 0.0025 md per day per m length of bridge in a Division / Project area.</p>		
			<p>Remarks:</p>		
	B		<p>Carryout Routine (regular maintenance) of Black top/ Gravel road in Hilly area as per Technical Specifications and direction of the Engineer, Unit = Km - day</p> <p>a) Labour Skilled day 0.05 Unskilled day 0.33</p> <p>b) Material fuel 5 % of Labour cost Training ARMP 1.7 % of Labour cost Insurance 1 % of Labour cost First aid 0.3 % of Labour cost</p> <p>c) Equipment Tools and plants 9 % of Labour cost Maintenance of tools 3 % of Labour cost</p> <p>1. In case of departmental Work provide fuel component 8 % 2. In case of more than two lane road add 20 % additional for each extra lane 3. For Routine maintenance of Bridge provide 0.25 md per day for upto 100 m and additional 0.0025 md per day per m length of bridge in a Division / Project area.</p>		
			<p>Remarks:</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity																																																		
29.2	2900	<p>Guideline for planning of maintenance activities</p> <p>Carryout Routine (reactive) maintenance, Guide lines for working out quantities from year of surfacing as per Technical Specifications and direction of the Engineer.</p> <table border="1"> <thead> <tr> <th>year from surfacing</th> <th>Percentage of surface area for Filling Potholes</th> <th>Percentage of shoulder area for making up of shoulder</th> <th>Percentage of slope surface area (in case of earthen embankment for Restoration of raincut.</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>upto 0.5</td> <td>7.5</td> <td>5</td> </tr> <tr> <td>II</td> <td>0.5 to 1.5</td> <td>9</td> <td>6</td> </tr> <tr> <td>III</td> <td>1.5 to 2.5</td> <td>10.5</td> <td>7</td> </tr> <tr> <td>IV</td> <td>2.5 to 3.5</td> <td>12</td> <td>8</td> </tr> <tr> <td>V</td> <td>3.5 to 5</td> <td>13.5</td> <td>9</td> </tr> </tbody> </table>	year from surfacing	Percentage of surface area for Filling Potholes	Percentage of shoulder area for making up of shoulder	Percentage of slope surface area (in case of earthen embankment for Restoration of raincut.	I	upto 0.5	7.5	5	II	0.5 to 1.5	9	6	III	1.5 to 2.5	10.5	7	IV	2.5 to 3.5	12	8	V	3.5 to 5	13.5	9																												
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V	3.5 to 5	13.5	9																																																			
	Remarks:	<p>1. Multiply the quantities of surface area for filling pot holes by 1.25 for AADT of commercial vehicle having 150 to 450 and by 1.5 for AADT of commercial vehicle more than 450.</p> <p>2. Add 20 % of above cost for repair and maintenance of cross drainage structure, road side structures and road furniture.</p> <p>3. Refer related items for Rate analysis , incase of scatter work add 20 % on each rate to cover loss of output</p>																																																				
	B	<p>Guidelines for calculation of Rating value based on quantity (%) of distress of Highway</p> <table border="1"> <thead> <tr> <th>Defect Type</th> <th colspan="3">Range of Distress</th> <th>Weightage Factor</th> </tr> </thead> <tbody> <tr> <td>Cracking (%)</td> <td>>10</td> <td>5 to 10</td> <td><5</td> <td>1.00</td> </tr> <tr> <td>Raveling(%)</td> <td>>10</td> <td>1 to 10</td> <td><1</td> <td>0.75</td> </tr> <tr> <td>Potholes(%)</td> <td>>1</td> <td>0.1 to 1</td> <td><0.1</td> <td>0.50</td> </tr> <tr> <td>Shoving(%)</td> <td>>1</td> <td>0.1 to 1</td> <td><0.1</td> <td>1.00</td> </tr> <tr> <td>Patching(%)</td> <td>>10</td> <td>1 to 10</td> <td><1</td> <td>0.75</td> </tr> <tr> <td>Settlement and Depression(%)</td> <td>>5</td> <td>1 to 5</td> <td><1</td> <td>0.75</td> </tr> <tr> <td>Rut Depth(mm) using 3 m straingth edge</td> <td>>10</td> <td>5 to 10</td> <td><5</td> <td>1.00</td> </tr> <tr> <td>Rating</td> <td>1</td> <td>1.1 to 2</td> <td>2.1 to 3</td> <td></td> </tr> <tr> <td></td> <td>Poor</td> <td>Fair</td> <td>Good</td> <td></td> </tr> </tbody> </table>	Defect Type	Range of Distress			Weightage Factor	Cracking (%)	>10	5 to 10	<5	1.00	Raveling(%)	>10	1 to 10	<1	0.75	Potholes(%)	>1	0.1 to 1	<0.1	0.50	Shoving(%)	>1	0.1 to 1	<0.1	1.00	Patching(%)	>10	1 to 10	<1	0.75	Settlement and Depression(%)	>5	1 to 5	<1	0.75	Rut Depth(mm) using 3 m straingth edge	>10	5 to 10	<5	1.00	Rating	1	1.1 to 2	2.1 to 3			Poor	Fair	Good			
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NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
29.3	C	Guidelines for serviceability indicator of highway			
		Serviceability Indicators for Highways			
	S.N	Serviceability Indicators	Level 1 (Good)	Level 2 (Fair)	Level 3 (Poor)
	1	Roughness (Max Permissible)	1800 mm/km	2400 mm/km	3200 mm/km
	2	Skid Resistance (Skid Number , SN by ASTM-274) minimum Desirable)	60 SN	50 SN	40 SN
	Remarks:	<p>1. Level 1 is expected to match with new pavement condition. Level 2 is the in service minimum desirable level and level 3 is the warrant for intervention to restore the pavement condition to level 1. Further details may refer from IRC 82-2015</p> <p>2. Based on above guidelines Department of Roads may develop codes/ guidelines and maintenance intervention including required Manpower, Material and Tools/ Equipment for better performance of road based .</p>			
	2900	<p>Providing required material and carryout Routine (regular + reactive maintenance) of Black top road as per Technical Specifications.</p> <p><i>Unit = 20 km per year (For 20 km length)</i></p> <p>a) Labour Skilled day 365.00 Unskilled day 3285.00</p> <p>b) Material Crushed stone aggregates nominal size 13.2 mm cum as per site Crushed stone aggregates nominal size 11.2 mm cum condition/ Bitumen VG 10 or similar tonne requireme Bitumen emulsion for tack coat including vertical sides of pot tonne nts hole.</p> <p>c) Equipment Tools and plants maintenance etc. 12 % of Labour cost Air compressor hour as per Hot mix plant hour requireme Tipper hour nts Smooth wheeled roller hour</p>			
	Remarks:	<p>1. Provide Tipper for every day(i.e. 300 days in year) and other equipment for for 150 days or add 15 % of Labour cost for transportation of material equipments and Labour to the different places.</p> <p>2. In case of in- house Gang of 1 supervisor and 9 Labour find cost as per contract and provide Tools, Equipment and Materials as per requirement</p>			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
29.4	2909	Restoration of Rain Cuts Providing and restoration of rain cuts in embankment slopes as per specification and direction of the Engineer. <i>Unit = cum (For 1 cum)</i> a) Labour Skilled Unskilled	day day	0.10 0.75
29.5	2909	Providing and restoration of rain cuts with surrounding material benching for 300 mm width, laying fresh Material in layers not exceeding 250 mm and compacting to restore the original alignment, levels and slopes as per Technical Specification and direction of the Engineer. Manual means <i>Unit = cum (For 10 cum)</i> a) Labour Skilled Unskilled b) Equipment Plate compactor (c) Materials Compensation for earth Taken from private land	day day hour cum	0.04 6.24 3.00 7.50
		Remarks: Only 75 per cent of fresh Material has been provided as 25 per cent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of there in cuts		
29.6	2909	Providing and restoration of rain cuts benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting to restore the original alignment, levels and slopes as per Specification and direction of the Engineer. Mechanical Means including conveyance of earth from other surrounding area with lead <i>Unit = cum (For 50 cum)</i> a) Labour Skilled Unskilled b) Equipment Excavator Tipper Plate compactor (c) Materials Compensation for earth Taken from private land	day day hour hour hour cum	1.00 15.00 2.00 1.4* L+2.1 15.00 37.50
		Remarks: 1. Only 75 per cent of fresh Material has been provided as 25 per cent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of there in cuts 2. L is two way distance from borrow area to working site.		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.7		2906	Maintenance of Earthen Shoulder (filling with fresh soil) Providing and making up loss of Material/ irregularities on shoulder to the design level by adding fresh approved soil and compacting as per Technical Specification and direction of the Engineer. <i>Unit = sqm (For 1000 sqm, assume 150 mm thick, 150 cum fresh material)</i> a) Labour Skilled day 2.00 Unskilled day 30.00 b) Equipment Excavator hour 6.00 Tipper hour 6.00 Plate compactor hour 24.00 (c) Materials Compensation for earth Taken from private land cum 192.00		
			Remarks: 1. L is two-way distance from borrow area to working site		
29.8		2906	Maintenance of Earth Shoulder (stripping excess soil) Stripping excess soil from the shoulder surface to achieve the approved level and compacting as per Technical Specifications and direction of the Engineer. <i>Unit = sqm (For 100 sqm, assume 75 mm thickness)</i> a) Labour Skilled day 0.10 Unskilled day 4.00 b) Equipment Plate compactor hour 6.00		
			Remarks: The earth stripped from earthen shoulders to be dumped on the side slopes locally for disposal.		
29.9		2904	Providing, laying and restoration of rain cuts with gravel or river bed Material , benching for 300 mm width, laying fresh Material in layers not exceeding 250 mm and compacting to restore the original alignment, levels and slopes as per Technical specifications and direction of the Engineer. Mechanical Means including conveyance of river bed gravel with lead <i>Unit = cum (For 50 cum)</i> a) Labour Skilled day 1.00 Unskilled day 15.00 b) Equipment Excavator hour 0.75 Tipper hour 3.00 Plate compactor hour 15.00		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.10	(i)	2903	<p>(c) Materials</p> <p>Compensation for Gravel</p> <p>1. L is two-way distance from borrow area to working site 2. Only 90 per cent of fresh Material has been provided as 10 per cent can be retrieved at site</p>	cum	57.60
			<p>Maintenance of bituminous surface road with Emulsion</p> <p>Providing required material and repair to pot holes including removal of failed material, trimming the sides to vertical , leveling the bottom, cleaning, filled with 75 mm Bituminous macadam applying bitumen /emulsion prime coat and tack coat as per Technical Specifications and direction of the Engineer.</p> <p><i>Unit = cum (For 187.5 x 0.075 = 14.06 cum = (30.94 Tonne))</i></p> <p>Assume 5% area need to repair</p> <p>a) Labour</p> <p>Skilled day 1.00</p> <p>Unskilled day 20.00</p> <p>b) Materials</p> <p>Emulsion (for primer @ 1 lit /sqm including side slope) tonne 0.22</p> <p>Emulsion (Tack coat @ 0.6 lit/sqm) tonne 0.13</p> <p>Bottom = 187.5</p> <p>Sides = 28.27</p> <p>Total = 215.77</p> <p>Bitumen for BM @ 3.5% by weight of mix = 30.94 x 3.5 / 100 = 1.082 tonne 1.08</p> <p>Volume of aggregate 29.86 / 1.5 = 19.90 cum</p> <p>Grading (1) (40 mm nominal size)</p> <p>37.5 - 25 mm 15% cum 2.99</p> <p>25 - 10 mm 45% cum 8.96</p> <p>10 - 5 mm 25% cum 4.98</p> <p>5 mm and below 15% cum 2.99</p> <p>c) Equipment</p> <p>Compressor hour 6.00</p> <p>Emulsion pressure distributor hour 6.00</p> <p>Mixture machine hour 6.00</p> <p>Smooth wheeled roller hour 6.00</p>		
	(ii)		<p>Providing required material and repair pot holes including removal of loose material, trimming of sides, cleaning of surface applying tack coat , 20 mm thick pre-mix carpet and seal coat with bitumen emulsion as per Technical Specifications and direction of the Engineer.</p> <p><i>Unit = sqm (For 200 sqm)</i></p> <p>a) Labour</p> <p>Skilled day 2.00</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.11	A	2903	Unskilled	day	18.00
			b) Materials		
			Emulsion	tonne	0.70
			Crushed stone aggregate 13.2 mm to 5.6 mm	cum	5.40
			Crushed sand passing 2.36 mm	cum	1.20
			c) Equipment		
			Concrete mixer / mixing plant	hour	6.00
			Air compressor	hour	6.00
			Emulsion pressure distributor	hour	6.00
			Smooth wheeled roller	hour	6.00
Remarks:			Cationic Emulsion may use for prime coat, Tack coat and Premix carpet.		
29.11	B	2903	Filling Pot-holes and Patch Repairs		
			Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20 mm.		
			Providing required material and repair the the pot holes including removal of failed material, trimming and finishing the surface applying tack coat on the sides and base of excavation , backfilling with hot bituminous Material and compaction as per Technical Specification and instruction of the Engineer.		
			<i>Unit = Sqm (For 600 sqm / 12 cum or 23.7 tonne)</i>		
			a) Labour		
			Unskilled	day	6.00
			Skilled	day	1.00
			b) Material		
			Crushed stone aggregates nominal size 13.2 mm	cum	12.96
			Crushed stone aggregates nominal size 5 mm	cum	6.48
Bitumen	tonne	1.08			
Bitumen or emulsion (for prime and tack coat)	tonne	0.36			
c) Equipment					
Air compressor	hour	6.00			
Hot mix plant	hour	1.00			
Tipper /tractor	hour	6.00			
Smooth wheeled roller	hour	6.00			
29.11	B	2903	Filling Pot-holes and Patch Repairs with Bituminous concrete, 40 mm.		
			Providing required material and repair the pot holes including removal of failed material, trimming and finishing the surface applying tack coat on the sides and base of excavation , backfilling with hot bituminous Material and compaction as per Technical Specification and instruction of the Engineer.		
			<i>Unit = Sqm (For 400 sqm/ 16 cum or 36.7 tonne)</i>		
			a) Labour		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
29.12	2903	Unskilled	day	8.00
		Skilled	day	1.00
		b) Material		
		I) Bitumen	tonne	1.83
		ii) emulsion for tack coat	tonne	0.25
		iii) Aggregates		
		Grading I - 19 mm(Nominal size)		
		20-10 mm 35 per cent	cum	8.14
		10-5 mm 23 per cent	cum	5.35
		5 mm and below 40 per cent	cum	9.30
		Or		
		Grading-II 13 mm (Nominal size)		
		13.2-10 mm 30 per cent	cum	6.98
		10-5 mm 25 per cent	cum	5.82
		5 mm and Below 43 per cent	cum	10.00
c) Equipment				
Air compressor	hour	6.00		
Hot mix plant	hour	1.00		
Tipper	hour	6.00		
Smooth wheeled roller	hour	6.00		
	Remarks:	1. Any one of the above alternatives of aggregate i.e. 19 mm or 13 mm nominal size may be adopted as per approved design. 2. For deep patch works add excavation manpower and base course , sub base course etc.		
29.12	2903	Crack Filling Providing and filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3 mm as per Technical Specifications and instruction of the Engineer <i>Unit = meter (For 1000 m)</i>		
		a) Labour		
		Skilled	day	1.00
		Unskilled	day	4.00
		b) Material		
		Slow-curing bitumen emulsion	Kg	80.00
		Stone crusher dust	cum	0.05
29.13	2903	Dusting Providing and applying crusher dust to areas of road where bleeding of excess bitumen has occurred as per Technical Specifications and direction of the Engineer. <i>Unit = Sqm (For 3500 sqm)</i>		
		a) Labour		
		Skilled	day	1.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity			
29.14	I	2903	Unskilled	day	5.00			
			b) Material					
			Stone crusher dust finer than 3 mm	cum	9.00			
			Slurry Seal					
			Providing and laying slurry seal consisting of a mixture of fine aggregates, Portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface 5 mm thickness					
			<i>Unit = Sqm (For 3500 sqm, 40 cum)</i>					
			a) Labour					
			Skilled	day	1.00			
			Unskilled	day	6.00			
			b) Equipment					
			Mechanical broom	hour	6.00			
			Air compressor	hour	6.00			
			Mobile slurry seal equipment	hour	6.00			
			Loader	hour	6.00			
			Tipper	hour	6.00			
			Pneumatic roller	hour	6.00			
			c) Material					
			Emulsion (@ 11 % of mix , i.e. 40* 0.11*2.2)	tonne	9.52			
			Fine aggregate 4.75 mm and below (@ 87 %)	cum	51.00			
			Filler (@ 2 %)	tonne	1.75			
			Cost of water	KL	6.00			
			II			3 mm thickness		
						<i>Unit = sqm (For 100 sqm, 30 cum)</i>		
a) Labour								
Skilled	day	1.00						
Unskilled	day	8.00						
b) Equipment								
Mechanical broom	hour	6.00						
Air compressor	hour	6.00						
Mobile slurry seal equipment	hour	6.00						
Loader	hour	6.00						
Tipper	hour	6.00						
c) Material								
Emulsion (@ 13 %)	tonne	8.20						
Fine aggregate 3 mm and below (@ 85 %)	cum	37.50						
Filler (@ 2%)	tonne	1.40						
Cost of water	KL	6.00						
Remarks:			1. Material are including 20 % wastage for scattered works					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	III	1.5 mm thickness <i>Unit = sqm (for 1200 sqm, 18 cum)</i>		
		a) Labour Skilled day 1.00 Unskilled day 6.00		
		b) Equipment Mechanical broom hour 6.00 Air compressor hour 6.00 Mobile slurry seal equipment hour 6.00 Loader hour 6.00 Tipper hour 6.00		
		c) Material Emulsion (@ 16 %) tonne 6.40 Fine aggregate 2.36 mm and below (@82 % cum 22.00 Filler (@ 2 %) tonne 0.80 Cost of water KL 6.00		
	Remarks:	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately		
29.15	2903	Fog Spray Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing. <i>Unit = sqm (For 5000 sqm)</i>		
		a) Labour Skilled day 1.00 Unskilled day 5.00		
		b) Equipment Mechanical broom hour 6.00 Air compressor hour 6.00 Bitumen emulsion pressure distributor tonne 6.00		
		c) Material Emulsion tonne 4.00		
	Remarks:	1. In case it is decided by the engineer to blind the fog spray, the following may be added		
		a) Labour Skilled day 1.00 Unskilled day 4.00		
		c) Material		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.16	I	2903	Crushed stone grit 3 mm	cum	13.00
			Emulsion	tonne	0.40
			Crack Prevention Courses		
			Stress Absorbing Membrane (SAM) crack width less than 6 mm		
			Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates as per Drawing and Technical Specifications.		
			<i>Unit = sqm (For 5000 sqm)</i>		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	6.00
			b) Equipment		
			Mechanical broom	hour	6.00
			Air compressor	hour	6.00
			Bitumen pressure distributor	hour	6.00
			Hydraulic Chip spreader	hour	6.00
			Smooth wheeled road roller	hour	6.00
			c) Material		
			Modified binder	tonne	4.80
			Crushed stone aggregates 5.6 mm size	cum	53.00
	II		Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm		
			Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates as per Drawing and Technical specifications.		
			<i>Unit = sqm (For 5000 sqm)</i>		
			a) Labour		
			Skilled	day	1.00
			Unskilled	day	6.00
			b) Equipment		
			Mechanical broom	hour	6.00
			Air compressor	hour	6.00
			Bitumen pressure distributor	hour	6.00
			Hydraulic Chip spreader	hour	6.00
			Smooth wheeled road roller	hour	6.00
			c) Material		
			Modified binder	tonne	6.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.17		2903	Bitumen Geotextile	tonne sqm	4.42 3850.00
			Remarks: 1. As bitumen overlay construction shall follow closely the fabric placement on the same day, an output of 3500 sqm only has been considered for the analysis which will cover a length of 500 m, of 7 m wide carriageway. This can be conveniently overlaid by a bituminous course in a day		
	Case - 1		Surface Dressing for maintenance works. Providing and laying surfacing dressing as wearing course in single coat using gravel of specified size for maintenance / repair works as per Technical Specification and instruction of the Engineer. <i>Unit = sqm (For 500 sqm)</i> :-19 mm nominal chipping size		
			a) Labour Unskilled Skilled	day day	87.00 11.00
			b) Equipment Bitumen boiler Vibratory roller Add: 0.5 per cent of (a) Labour for T&P	hour hour	6.00 6.00
			c) Material Bitumen Crushed stone chipping 19 mm nominal size	tonne cum	0.60 7.50
	Case - II		Remarks: 1. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract. Use rate of same type of Bitumen		
			13 mm nominal size chipping <i>Unit = sqm (For 750 sqm)</i>		
			a) Labour Unskilled Skilled	day day	58.00 10.00
			b) Equipment Bitumen boiler Vibratory roller Add: 0.5 per cent of (a) Labour for T&P	hour hour	6.00 6.00
			c) Material Bitumen Crushed stone chipping 13 mm nominal size	tonne cum	0.75 7.50

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	Remarks:	<p>1. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract.</p> <p>2. Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder. Alternatively, chips may be pre-coated as per Specification</p> <p>3. Input for the second coat, where required, will be the same as per the 1st coat mentioned above</p>		
	Case - III	<p>9.5 mm nominal size chipping</p> <p><i>Unit = sqm (for 850 sqm)</i></p> <p>a) Labour</p> <p>Unskilled day 58.00</p> <p>Skilled day 10.00</p> <p>b) Equipment</p> <p>Bitumen boiler oil fired hour 6.00</p> <p>Vibratory roller hour 6.00</p> <p>Add: 0.5 per cent of (a) Labour for T&P .</p> <p>c) Material</p> <p>Bitumen tonne 0.77</p> <p>Crushed stone chipping, 9.5 mm nominal size cum 6.80</p>		
	Remarks	<p>1. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract.</p>		
	Case - IV	<p>6 mm nominal size chipping</p> <p><i>Unit = sqm (for 850 sqm)</i></p> <p>a) Labour</p> <p>Unskilled day 58.00</p> <p>Skilled day 10.00</p> <p>b) Equipment</p> <p>Bitumen boiler oil fired hour 6.00</p> <p>Vibratory roller hour 6.00</p> <p>Add: 0.5 per cent of (a) Labour for T&P</p> <p>c) Material</p> <p>Bitumen tonne 0.64</p> <p>Crushed stone chippings 6 mm nominal size cum 3.40</p>		
	Remarks	<p>1. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract.</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.18		2900, 900	Hill Side Drain Clearance Removal of earth from the choked hill side drain and disposing it on the valley side manually <i>Unit = meter (For 10 meter)</i> Assuming muck causing choking of drain to be 0.2 cum per meter, quantity of earth to be removed for 10 metres = 2 cum a) Labour Skilled Unskilled	day day	1.00 1.00
29.19	A	2900,900	Land Slide Clearance in soil Clearance of land slides in soil and ordinary rock by machine and disposal of the same on the valley side <i>Unit = cum (For 500 cum)</i> a) Labour Skilled Unskilled b) Equipment Dozer/loader/Excavator	day day hour	1.00 3.00 6.00
	B		Clearance of land slides in soil and ordinary rock by machine and disposal of the same on the valley side or loaded to a truck. <i>Unit = cum (For 300 cum)</i> a) Labour Skilled Unskilled b) Equipment Dozer/loader/Excavator	day day hour	1.00 1.00 6.00
	Remarks:		<p>1. Land Slide clearance involves pushing / loading of loose earth slide on the road surface from hill face on the valley side. Since no cutting of original ground is involved, the output of Loader has been taken as 60 cum per hour for soil, ordinary rock and blasted hard rock. However, if there are objection to disposing of earth on valley side, additional resources such as Dump truck , tractor etc. shall be considered as per site conditions.</p> <p>2. Add additional hour of Loader for mobilization and demobilization considering speed at least 5 KMPH to go up to site and return back to Garage. Fuel may be taken as 15 lit per hour for guidance.</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
29.20			<p>Landslide Clearance in Hard Rock Requiring Blasting Clearing of land slide in hard rock requiring blasting for 50 per cent of the boulders and disposal of the same on the valley side. <i>Unit = cum (For 100 cum)</i></p> <p>a) Labour Skilled (Driller/Blaster) day 1.00 Unskilled day 2.00</p> <p>b) Equipment Dozer hour 6.00 Air compressor hour 6.00</p> <p>c) Materials Gelatin kg 17.50 Electric Detonators nos 70.00</p> <p>Remarks:</p> <ol style="list-style-type: none"> Credit for the rock if found acceptable as construction Material shall be afforded Add cost for safety person including security for transportation and storage of Blasting materials. add cost or separate item for mobilization and demobilization of Equipment 		
29.21	A		<p>Snow Clearance on Roads with Dozer Snow clearance from road surface by a machine and disposing it on the valley side <i>Unit = cum (For 1500 cum)</i></p> <p>a) Labour Skilled day 1.00 Unskilled day 2.00</p> <p>b) Equipment Dozer / Loader hour 6.00</p> <p>Remarks:</p> <ol style="list-style-type: none"> Labour provided will not be cutting the snow. They will be guiding the machine operator on the alignment of the road as entire surface gets covered with snow and the edges of the road are not visible and for changing the blade angle. Also they will keep a watch on the hill side for any eventuality of avalanches, slide etc. for land slide/ snow clearance works add additional hour of Loader for mobilization and demobilization of equipment (Loader) considering speed at least 5 KMPH to go up to site and return back to Garage. Fuel consumption rate may be taken as 15 lit per hour for Loader. <p>Remarks:</p> <ol style="list-style-type: none"> For related to maintenance works add cost for mobilization and demobilization of Equipment having speed at least 5 km per hour wherever necessary as a separate item in contract. 		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
29.22	A	Carryout Routine using Labour based method for Local road as per direction of the Engineer, Unit = Km- Annual District Road , Rural road class "A"			
		Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 12 days per month for class "A" road			
		a)Labour			
		Supervisor	day	2.88	
		Unskilled	day	72.00	
		b) Equipment			
		Tools and plants	9 % of Labour cost		
		Maintenance of tools	3 % of Labour cost		
		B	Village Road , Rural road class "B"		
			Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 6 days per month for class "B" road		
			a)Labour		
			Supervisor	day	1.44
			Unskilled	day	36.00
			b) Equipment		
			Tools and plants	9 % of Labour cost	
			Maintenance of tools	3 % of Labour cost	
C	Main Trail , Rural road Class "C"				
	Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 3 days per month for class "C" road				
	a)Labour				
	Supervisor	day	0.72		
	Unskilled	day	18.00		
	b) Equipment				
	Tools and plants	9 % of Labour cost			
	Maintenance of tools	3 % of Labour cost			
	D	Village Trail , Rural road Class "D"			
		Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 1.5 days per month for class "D" road			
a)Labour					
Supervisor		day	0.36		
Unskilled		day	9.00		
b) Equipment					
Tools and plants		9 % of Labour cost			
Maintenance of tools		3 % of Labour cost			
Remarks :		Office has to made arrangement for tools such as Shovel, Pck axle, Forked , Crowbar, Khukuri, Hammer, Chisel, Sickle,Doko/Basket, Wheel barow.			

SECTION 3000 - SUBSURFACE GEOTECHNICAL INVESTIGATION

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
30.1		3003	Excavation of pits/trenches for sub-surface Geo-technical investigation in mixed soil and lifting of material all complete (Length & breath depending upon working condition) as per direction of the Engineer. <i>Unit = cum (For 10 cum)</i> Depth up to 3 m		
	I		a) Labour Skilled Unskilled	day day	1.0 7.0
	II		Depth up to 3 - 4.5 m <i>Unit = cum (For 10 cum)</i> a) Labour Skilled Unskilled	day day	1.0 9.0
30.2		3000	Mobilisation and Demobilisation of drilling / Boring equipments, accessories, etc for sub-surface Geo-technical investigation as per direction . <i>Unit = km-job (For upto 50 Km)</i>		
	(i)		BT Surfaced Road Speed with load : 15 km / hour. a) Labour Skilled Unskilled for loading un loading Unskilled for transportation from road head to investigation site Unskilled for installation of drilling / boring equipment for first bore hole loading un loading Engineer / Technician for installation/ dismanatle of boring equipment b) Equipments. Truck	day day day day day day hour	2.0 2.0 6.0 6.0 3.0 8.0
	Remarks:		1. Rate obtained shall be minimum for upto 50 km, if the length of travel distance (one way) is more than 50 , add additional cost of per kmfor transportation. 2. In case of Gravelled Road multiply above rate by 1.5 3. In case of Earthen road multiply above rate by 2.0		
30.3		3000	Erect dismantle and move boring rig with drilling equipments at each bore hole complete as directed by the Engineer.. Unit = nos. (for 2 nos of movement) a) Labour Skilled Unskilled Technician	day day day	1.0 3.0 3.0

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
30.4	(i)	3000	Bore with shell and auger or by percussion method in all soils other than rock to a depth below ground level complete as directed by the Engineer. Depth below bed level upto 5.0 m		
			<i>Unit = m (For 5 m)</i>		
			a) Labour		
			Unskilled	day	4.0
			semi skilled	day	2.0
			Technician	day	1.0
			b) Material		
			Cost of water	KL	1.0
			c) Equipments.		
			Auger / percussion drilling set	hour	8.0
	(ii)		Depth below bed level 5.0 m - 10 m : Add 20 % additional on rate of upto 5 m		
	(iii)		Depth below bed level 10 m - 15m : Add 40 % additional on rate of up to 5 m		
	(iv)		Depth below bed level 15 m - 20 m : Add 60 % additional on rate of upto 5 m		
30.5	A (i)	3000	Rotary core drilling in soil /rock and take continuous rock core to a depth below ground level with Tungstun carbide bits including core sampling all complete as directed		
			soft Soil		
			Depth below bed level upto 5.0 M		
			Unit = meter (For upto 5 meter)		
			a) Labour		
			Unskilled	day	3.0
			semi skilled	day	1.0
			Technician	day	0.5
			b) Material		
			Cost of water	KL	2.0
			Drill bit	nos.	0.3
			Core box	meter	5.0
c) Equipment.					
Rotary drill	hour	4.0			
	(ii)		Depth below bed level 5.0 m - 10 m : Add 10 % additional on rate of upto 5 m		
	(iii)		Depth below bed level 10 m - 15m : Add 20 % additional on rate of up to 5 m		
	(iv)		Depth below bed level 15 m - 20 m : Add 30 % additional on rate of upto 5 m		
	(v)		Depth below bed level 20 m - 25 m : Add 40 % additional on rate of upto 5 m		
	(vi)		Depth below bed level > 25 m : Add 50 % additional on rate of upto 5 m		
	B		Soil (gravel BMS etc)		
	(i)		Depth below bed level upto 5.0 M		
			Unit = meter (For upto 5 meter)		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		a) Labour Unskilled semi skilled Technician	day day day	8.0 1.0 1.0
		b) Material Cost of water Drill bit Core box	KL nos. meter	2.0 1.0 5.0
		c) Equipment. Rotary drill	hour	8.0
	(ii)	Depth below bed level 5.0 m - 10 m : Add 10 % additional on rate of upto 5 m		
	(iii)	Depth below bed level 10 m - 15m : Add 20 % additional on rate of up to 5 m		
	(iv)	Depth below bed level 15 m - 20 m : Add 30 % additional on rate of upto 5 m		
	(v)	Depth below bed level 20 m - 25 m : Add 40 % additional on rate of upto 5 m		
	(vi)	Depth below bed level > 25 m : Add 50 % additional on rate of upto 5 m		
	C	Soft Rock		
	(i)	Depth below bed level upto 5.0 m Unit = meter (For upto 5 meter)		
		a) Labour Unskilled semi skilled Technician	day day day	6.0 1.0 1.0
		b) Material Cost of water Drill bit Core box	KL nos. meter	4.0 1.0 5.0
		c) Equipment. Rotary drill	hour	8.0
	(ii)	Depth below bed level 5.0 m - 10 m : Add 10 % additional on rate of upto 5 m		
	(iii)	Depth below bed level 10 m - 15m : Add 20 % additional on rate of up to 5 m		
	(iv)	Depth below bed level 15 m - 20 mM : Add 30 % additional on rate of upto 5 m		
	(v)	Depth below bed level 20 m - 25 mM : Add 40 % additional on rate of upto 5 m		
	(vi)	Depth below bed level > 25 : Add 50 % additional on rate of upto 5 m		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	D		Hard Rock		
	(i)		Depth below bed level upto 5.0 m		
			Unit = meter (For upto 5 meter)		
			a) Labour		
			Unskilled	day	12.0
			semi skilled	day	2.0
			Technician	day	1.0
			b) Material		
			Cost of water	KL	6.0
			Drill bit	nos	1.5
			Core box	meter	5.0
			c) Equipment.		
			Rotary drill	hour	16.0
	(ii)		Depth below bed level 5.0 m - 10 m : Add 10 % additional on rate of upto 5 m		
	(iii)		Depth below bed level 10 m - 15m : Add 20 % additional on rate of up to 5 m		
	(iv)		Depth below bed level 15 m - 20 mM : Add 30 % additional on rate of upto 5 m		
	(v)		Depth below bed level 20 m - 25 mM : Add 40 % additional on rate of upto 5 m		
	(vi)		Depth below bed level > 25 m : Add 50 % additional on rate of upto 5 m		
30.6		3000	Taking disturbed sample during drilling as directed by the Engineer. <i>Unit= nos. (For 10 nos)</i>		
			a) Labour		
			Technician	day	1.0
			Unskilled	day	2.0
			b) Material		
			Cost of consumable items: 25 % of labour cost		
30.7		3000	Taking Undisturbed sample during drilling as directed by the Engineer. <i>Unit= nos. (For 10 nos)</i>		
			a) Labour		
			Technician	day	1.0
			Unskilled	day	4.0
			b) Material		
			Cost of consumable items: 25 % of labour cost		
30.8		3000	Carry out Standard penetration test (SPT) during borig as directed by the Engineer <i>Unit= nos. (For 10 nos)</i>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
30.9	3000	<p>a) Labour Technician Unskilled</p> <p>b) Equipment SPT hammer</p>	<p>day day day</p>	<p>1.0 4.0 1.0</p>
		<p>Providing & installing piezometers at the location of each bore holes for study of fluctuations in water table (Water table studies to be carried out weekly for a period of 3 months) with regular weekly interval and predetermined time & day each week and depth of water recorded with respect to the reduced level. Diurnal variations to be noted for 3 selected weeks during the period of observations and reporting. <i>Unit= nos. (For 10 nos)</i></p> <p>a) Labour <u>for installation</u> Engineer / Technician semi skilled Unskilled for reading Engineer / Technician semi skilled <u>for security</u> Unskilled</p> <p>b) Equipment piezometr (10 nos 10 m each for 3 month duration)</p>	<p>day day day day day day day</p>	<p>1.0 3.0 6.0 3.0 12.0 90.0 100.0</p>
	Remarks	Adjust length of piezometer as per site condition		

SECTION - 3100 MISCELLANEOUS WORKS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
31.1	2000, 3105	<p>Providing and laying precast RCC railing of M 30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, center to center spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per Drawings and Technical specifications. <i>Unit = meter (For 2 X 24 m span= 48 m)</i></p> <p>a) Labour Skilled day 8.00 Unskilled day 40.00</p> <p>b) Material Cement concrete M 30 cum 4.09 Add 5 per cent of above cost for form work HYSD bar tonne 0.87 Add 5 per cent of material for handling and fixing of precast panels in position</p>		
	Remarks:	<p>1. Quantities of Material have been adopted from assumption this may modified as per actual situation, 2. 48 m length is the total linear length adding both sides of 24 m span.</p>		
31.2	3105	<p>Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification <i>Unit = m (For 2 X 50 m span = 100 m)</i></p> <p>a) Labour Skilled day 30.00 Unskilled day 60.00</p> <p>b) Material: 1) ISMC 100 tonne 2.95 2) MS Flat tonne 1.01 3) MS bars tonne 0.18 4) MS bolts, nuts and washers tonne 0.15</p> <p>Add @ 5 per cent of cost of Material for painting one shop coat with red oxide primer and three coats of synthetic enamel paint and consumables to safeguard against weathering and corrosion. Add 1 percent of cost of material for fixing vertical posts</p> <p>Add 1 per cent of cost of Material for electricity charges, welding and drilling equipment, electrodes and other consumables</p>		
31.3		<p>Providing and fixing Drainage Spouts complete as per Drawing and Technical specifications. <i>Unit = no. (For 10 no.)</i></p> <p>a) Labour <u>For fabrication</u> Skilled (Blacksmith, welder etc.) day 1.00 Unskilled day 2.00 <u>For fixing in position</u> Skilled day 1.00</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	4.00
			b) Material		
			Corrosion resistant Structural steel including 5 per cent wastage	Kg	40.00
			GI pipe 100 mm dia	meter	60.00
			GI bolt 10 mm Dia	nos	60.00
			Galvanized MS flat clamp	nos	20.00
			Add @ 5 per cent of cost of Material and Labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.		
			Remarks:		
			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 GI Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.		
31.4	(i)	3103	Filler joint Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification. <i>Unit = meter (For 12 m, 12 m long X 250 mm wide)</i>		
			a) Labour		
			Unskilled	day	1.00
			Skilled	day	1.00
			b) Material		
			Copper plate	kg	55.00
	(ii)		Providing & fixing 20 mm thick compressible fiber board in expansion joint complete as per drawing & Technical Specification. <i>Unit = meter (For 12 meter)</i>		
			a) Labour		
			Unskilled	day	1.00
			Skilled	day	1.00
			b) Material		
			20 mm thick compressible fiber board	sqm	3.00
	(iii)		Providing and fixing in position 20 mm thick pre-moulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per Drawing and technical specifications. <i>Unit = meter (For 12 meter)</i>		
			a) Labour		
			Unskilled	day	1.00
			Skilled	day	1.00
			b) Material		
			Pre-moulded joint filler	sqm	3.60

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	(iv)		<p>Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 per cent bitumen by weight <i>Unit = meter (For 12 meter long X 100 mm wide X 10 mm deep)</i></p> <p>a) Labour Unskilled Skilled</p> <p>b) Material Sand Bitumen</p>	day day cum cum	1.00 1.00 0.012 0.001
	Remarks:		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		
31.5		3100	<p>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 200 mm x 6 mm of weldable structural steel conforming to IS: 2062, as per Drawings and Technical Specifications. <i>Unit = meter (For 12 meter)</i></p> <p>a) Labour Unskilled Skilled</p> <p>b) Material Crushed stone aggregate 12.5 mm nominal size Polymer modified bitumen Galvanized structural steel plate Add 1 per cent cost of material for welding and foam caulking/backer rod and other incidentals.</p> <p>c) Equipment Mastic cooker Roller</p>	day day cum kg kg hour hour	2.00 1.00 0.75 77.50 113.00 6.00 6.00
	Remarks:		1. 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. 2. Input of Roller may be reduced upto 1 hr for 12 meter length . if quantity of work is high at particular site.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
31.6	3105	<p>Tubular Steel Railing on Medium Weight Steel Channel (ISMC series) 100 mm x 50 mm Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m center to center, complete as per Drawing and Technical specifications. <i>Unit = meter (For 100 meter)</i></p> <p>i) Excavation for foundation</p> <p>ii) Foundation concrete M-15</p> <p>iii) Painting of pipe</p> <p>iv) Painting of channel section</p> <p>a) Labour (For fixing at site) Unskilled Plumber / skilled</p> <p>b) Material Steel pipe 50 mm external dia as per IS: 1239 Medium weight steel channel (ISMC series) 100 mm x 50 mm, 10.8 metres length @ 9.2 kg per meter Add for drilling holes @ 2 per cent of cost of channels</p> <p>c) Equipment Tractor-trolley</p>	<p>cum</p> <p>cum</p> <p>sqm</p> <p>sqm</p> <p>day</p> <p>day</p> <p>meter</p> <p>kg</p> <p>hour</p>	<p>12.96</p> <p>6.48</p> <p>47.10</p> <p>21.60</p> <p>4.00</p> <p>1.00</p> <p>300.00</p> <p>993.60</p> <p>6.00</p>
31.7	3105	<p>Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M 20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres center to, complete as per Drawing and Technical Specifications. <i>Unit = meter (For 100 meter)</i></p> <p>i) Excavation for foundation</p> <p>ii) Foundation concrete M - 15</p> <p>iii) RCC M - 20</p> <p>iv) Painting of pipe</p> <p>a) Labour Skilled (plumber) Unskilled</p> <p>b) Material Steel pipe 50 mm dia as per IS: 1239</p> <p>c) Equipment Tractor-trolley</p>	<p>cum</p> <p>cum</p> <p>cum</p> <p>sqm</p> <p>day</p> <p>day</p> <p>meter</p> <p>hour</p>	<p>12.96</p> <p>6.48</p> <p>3.20</p> <p>47.10</p> <p>0.00</p> <p>1.00</p> <p>6.00</p> <p>300.00</p> <p>6.00</p>