



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> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Clearing and Grubbing Road Land .</b> <b>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.</b>		
	(i)		<b>By Manual Means:-</b>		
	A		<b>In area of light jungle (less than 15 number per 100 sqm)</b> <i>Unit = sqm, (for 10000 sqm)</i>		
			a) <b>Labour</b> Unskilled	day	200.00
	B		<b>In area of thorny jungle ( more than 15 numbers per 100 sqm)</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
			a) <b>Labour</b> Unskilled	day	300.00
	C		<b>Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes</b> <i>Unit =Cum, (for 100 cum)</i>		
			a) <b>Labour</b> Unskilled	day	200.00
	(ii)		<b>By Mechanical Means</b>		
	A		<b>In area of light jungle (less than 15 number per 100 sqm )</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
			a) <b>Labour</b> Unskilled	day	6.00
			b) <b>Equipment</b> Dozer/ Excavator	hour	12.00
	B		<b>In area of thorny jungle ( more than 15 numbers per 100 sqm)</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
			a) <b>Labour</b> Unskilled	day	9.00
			b) <b>Equipment</b> Dozer/ Excavator	hour	12.00
	C		<b>Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes</b> <i>Unit = Cum, (for 100 cum)</i>		
			a) <b>Labour</b> Unskilled	day	20.00

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		b) <b>Equipment</b> Dozer/ Excavator	hour	6.00
	<b>II</b>	<b>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.</b>		
	(i)	<b>By Manual Means:-</b>		
	<b>A</b>	<b>In area of light jungle (less than 15 number per 100 sqm)</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) <b>Labour</b> Unskilled	day	225.00
		b) <b>Equipment</b> Tractor-trolley	hour	12.00
	<b>B</b>	<b>In area of thorny jungle ( more than 15 numbers per 100 sqm)</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) <b>Labour</b> Unskilled	day	325.00
		b) <b>Equipment</b> Tractor-trolley	hour	12.00
	<b>C</b>	<b>Felling and uprooting of bamboo clearing the area, stacking of bamboo and disposing of wastes</b> <i>Unit = cum, (for 100 cum)</i>		
		a) <b>Labour</b> Unskilled	day	225.00
		b) <b>Equipment</b> Tractor-trolley	hour	12.00
	(ii)	<b>By Mechanical Means</b>		
	<b>A</b>	<b>In area of light jungle (less than 15 number per 100 sqm )</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) <b>Labour</b> Unskilled	day	8.00
		b) <b>Equipment</b> Dozer/ Excavator	hour	12.00
		Tractor-trolley	hour	12.00
	<b>B</b>	<b>In area of thorny jungle ( more than 15 numbers per 100 sqm)</b> <i>Unit = sqm, (for 10,000 sqm)</i>		
		a) <b>Labour</b> Unskilled	day	12.00
		b) <b>Equipment</b>		

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

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
2.3	(iv)	201	<b>Girth above 2500 mm</b> <i>Unit = Number (for 1 number)</i>		
			<p><b>a) Labour</b> Unskilled</p> <p><b>b) Equipment</b> Tractor-trolley</p>	day	50.00
2.4	(i)	202	<b>Clearing Grass and Removal of Rubbish and Dressing and levelling the construction surface</b> <b>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.</b> <b>By Manual Means</b> <i>Unit = sqm, (for 10000 sqm)</i>		
			<p><b>a) Labour</b> Unskilled</p>	day	100.00
2.4	I	A	<b>Dismantling of Structures</b> <b>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</b> <b>Lime /Cement Concrete</b> <b>By Manual Means</b> <i>Unit = cum, (for 20.0 cum)</i>		
			<b>Lime Concrete, cement concrete grade M-10 and below</b>		
			<b>a) Labour</b> Skilled	day	1.00
			Unskilled	day	24.00
			<b>b) Equipment</b> Tractor-trolley	hour	6.00
			<b>B</b>		
			<b>Cement Concrete Grade M-15 &amp; M-20</b> <i>Unit = cum, (for 20.0 cum)</i>		
			<b>a) Labour</b> Skilled	day	1.00
			Unskilled	day	30.00
			<b>b) Equipment</b> Tractor-trolley	hour	6.00
2.4	C		<b>Pre-stressed / Reinforced cement concrete grade M-20 &amp; above</b> <i>Unit = cum, (for 10.0 cum)</i>		
			<p><b>a) Labour</b> Technician</p>	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>b) Equipment</b>		
		Tractor-trolley	hour	6.00
	<b>II</b>	<b>By Mechanical Means</b>		
	<b>A</b>	<b>Cement Concrete Grade M-15 &amp; M-20</b>		
		<i>Unit = cum, (for 10.0 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	6.00
		<b>b) Equipment</b>		
		Air Compressor	hour	6.00
		Drilling machine with bit and accessories	hour	6.00
		Tractor-trolley	hour	6.00
	<b>B</b>	<b>Prestressed / reinforced cement concrete grade M-20 &amp; above</b>		
		<i>Unit = cum, (for 10.0 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	10.00
		<b>b) Equipment</b>		
		Air Compressor	hour	6.00
		Drilling machine with bit and accessories	hour	6.00
		Tractor-trolley	hour	6.00
	<b>(ii)</b>	<b>Dismantling Brick / Tile work</b>		
	<b>A</b>	<b>In lime mortar</b>		
		<i>Unit = cum, (for 20.0 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	12.00
		<b>b) Equipment</b>		
		Tractor-trolley	hour	6.00
	<b>B</b>	<b>In cement mortar</b>		
		<i>Unit = cum, (for 10.0 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	10.00
		<b>b) Equipment</b>		
		Tractor-trolley	hour	6.00
	<b>C</b>	<b>In mud mortar</b>		

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

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

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

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
2.5	A	<i>Unit = meter, (for 10 meter)</i> <b>Up to 600 mm dia</b>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	5.00	
		<b>B</b>	<b>Above 600 mm to 900 mm dia</b>		
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	8.00	
		<b>C</b>	<b>Above 900 mm</b>		
	<b>a) Labour</b>				
Skilled	day	1.00			
Unskilled	day	12.00			
	<b>Remarks</b>	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.			
	<b>202</b>	<b>Dismantling of Flexible Pavements</b> <b>Dismantling of flexible pavements and disposal of dismantled Material up to a lead of 1000 metres, stacking serviceable and unserviceable Material separately</b> <i>Unit = cum, (for 10.0 cum)</i>			
	<b>I</b>	<b>By Manual Means</b>			
	<b>A</b>	<b>Bituminous courses</b>			
	<b>a) Labour</b>				
	Skilled	day	1.00		
	Unskilled	day	15.00		
	<b>b) Equipment</b>				
	Tractor-trolley	hour	6.00		
	<b>B</b>	<b>Granular courses</b>			
	<b>a) Labour</b>				
	Skilled	day	1.00		
	Unskilled	day	12.00		
	<b>b) Equipment</b>				
	Tractor-trolley	hour	6.00		
	<b>II</b>	<b>By Mechanical Means</b>			
		<i>Unit = cum, (for 20.0 cum)</i>			
	<b>A</b>	<b>Bituminous course</b>			
	<b>a) Labour</b>				
	Skilled	day	1.00		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity	
2.6	202	Unskilled	day	9.00	
		<b>b) Equipment</b>			
		Tractor-trolley	hour	6.00	
		Tractor with ripper	hour	6.00	
		<b>Dismantling of Cement Concrete Pavement</b>			
		<b>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</b>			
		<i>Unit = cum, (for 10.0 cum)</i>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Semi skilled	day	8.00	
Unskilled	day	8.00			
<b>b) Equipment</b>					
Air compressor	hour	6.00			
Tractor-trolley	hour	6.00			
Joint Cutting Machine	hour	6.00			
	<b>Remarks</b>	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	<b>Dismantling of Guard Rails</b> <b>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.</b> <i>Unit = meter, (for 100 meter)</i>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	20.00	
		<b>b) Equipment</b>			
		Tractor-trolley	hour	6.00	
2.8	202	<b>Dismantling of Kerb Stone</b> <b>Dismantling Kerb stone by manual means and disposal of dismantled Material with all lifts and up to a lead of 1000 meter</b> <i>Unit = meter, (for 100 meter)</i>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	3.00	
		<b>b) Equipment</b>			

NORMS FOR RATE ANALYSIS

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

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
2.13	202	<p><b>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 .</b></p> <p><i>Unit = meter, (for 100 meter)</i></p> <p><b>a) Labour</b></p> <p>Unskilled</p> <p>Skilled (Plumber)</p> <p><b>b) Equipment</b></p> <p>Truck</p> <p>Crane</p>	day	25.00
		<p>day</p> <p>2.00</p> <p>hour</p> <p>6.00</p> <p>hour</p> <p>6.00</p>		
	<b>Remarks</b>	The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.		
2.13	202	<p><b>Removal of Cement Concrete Pipe of Sewer Gutter</b></p> <p><b>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.</b></p> <p><i>Unit = meter, (for 100 meter)</i></p> <p><b>a) Labour</b></p> <p>Unskilled</p> <p><b>b) Equipment</b></p> <p>Crane</p> <p>Truck flat body</p>	day	30.00
		<p>hour</p> <p>6.00</p> <p>hour</p> <p>6.00</p>		
	<b>Remarks</b>	The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.		
2.14	202	<p><b>Removal of Telephone / Electric Poles and Lines</b></p> <p><b>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</b></p> <p><i>Unit = nos, (for 30 nos)</i></p> <p><b>a) Labour</b></p> <p>Unskilled</p> <p>Skilled (Electrician/Lineman)</p> <p><b>b) Equipment</b></p> <p>Tractor-trolley</p>	day	15.00
		<p>day</p> <p>3.00</p> <p>hour</p> <p>6.00</p>		



**SECTION 300 - SOIL IMPROVEMENT**

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
3.1	301	<b>Reinforced Soil wall Structure with Tera Mesh System (TMS) Facing:</b>		
		<b>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</b>		
		<i>Unit = sqm, ( For 1000 sqm; 10 m height 100 m length)</i>		
		<b>(a) Labour</b>		
		Skilled	day	346.0
		Unskilled	day	1398.0
		<b>(b) Equipment</b>		
		Tractor-trolley	hour	24.0
		<b>(c) Material</b>		
		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		
<b>Remarks</b>		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.		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
3.2	301	<p><b>Reinforced Soil wall Structure with Green Terra Mesh (GTM) Facing:</b>  <b>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 &gt;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.</b></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><b>(a) Labour</b>                      Skilled day 140.0                      Unskilled day 545.0</p> <p><b>(b) Equipment</b>                      Tractor-trolley hour 24.0</p> <p><b>(c) Material</b>                      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><b>(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</b> cum 299.5</p> <p><b>(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</b> cum 7987.2</p> <p><b>(f) Seeding for vegetation</b> sqm 998.4</p>		
	<b>Remarks</b>	<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><b>Reinforced Soil wall Structure with Concrete Facing:</b>  <b>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 &gt;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.</b></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><b>(a) Labour</b>                      Skilled day 80.0                      Unskilled day 160.0</p> <p><b>(b) Equipment</b>                      Tractor-trolley hour 72.0</p> <p><b>(c) Material</b>                      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 cum 725.0                      658.94 cum)                      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><b>(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</b> 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><b>Boundary pillar</b>  <b>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.</b>  <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><b>Transportation and fixing</b>                      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><b>GI Barbed Wire fencing</b>  <b>GI Barbed Wire Fencing 1.2 Meter High with RCC post</b></p> <p><b>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.</b></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><b>c) Painting</b> (Applying two coats of painting including primer coat on exposed surface of RCC posts)</p> <p><b>Transportation and fixing</b></p> <p><b>d) Labour</b> Skilled (Blacksmith)                      day            0.25 Unskilled    day            3.00</p> <p><b>e) Materials</b> Barbed wire    kg            31.42 Add for GI staple binding wire, drilling holes, etc. @ 5 per cent of the cost of binding wire</p>		
	<b>Remarks</b>	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.		
	<b>B</b>	<p><b>GI Barbed Wire Fencing 1.8 Meter High with RCC post</b></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><b>a) M-15 grade of the concrete</b>                      cum            0.70 <b>b) Steel reinforcement</b>                                      kg            101.15 <b>c) Painting</b>    sqm            12.10</p> <p><b>Transportation and fixing</b></p> <p><b>d) Labour</b> Skilled (Blacksmith)                                      day            0.50 Unskilled    day            3.50</p> <p><b>e) Materials</b> Barbed wire    kg            40.15 Add for GI staple binding wire, drilling holes, etc. @ 5 per cent of the cost of binding wire</p>		
	<b>Remarks</b>	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.		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
4.2	C	<p><b>404 GI Barbed Wire Fencing 1.2 Meter High on Angle Iron</b>  <b>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.</b>  <b>Unit = meter (For 30 meters)</b></p> <p><b>a) Labour</b>  Skilled (Blacksmith)                      day                      0.25  Unskilled    day                      2.00</p> <p><b>b) Material</b>  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><b>c) Painting</b>  Applying two coats of painting                      sqm                      2.11</p>		
	<b>Remarks</b>	<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	<p><b>404 GI Barbed Wire Fencing 1.8 Meter High</b>  <b>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.</b>  <b>Unit = meter (For 30 meters)</b></p> <p><b>a) Labour</b>  Skilled (Blacksmith)                      day                      0.40  Unskilled    day                      3.00</p> <p><b>b) Material</b>  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><b>c) Painting</b>  Applying two coats of painting                      sqm                      3.96</p>		
	<b>Remarks</b>	<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>		

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
4.3		400	<p><b>Fencing With Welded Steel Wire Fabric 75 mm x 50 mm</b></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><b>a) Labour</b>                      Skilled (Welder) day 1.00                      Unskilled day 3.00</p> <p><b>b) Material</b>                      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><b>OR</b>                      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><b>c) Equipment</b>                      Tractor-trolley hour 0.10</p> <p><b>d) Painting</b>                      Painting two coats including priming sqm 8.00</p>		
	Note		<p>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</p>		

NORMS FOR RATE ANALYSIS

**SECTION 500 - QUALITY CONTROL**

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.1	504	<b>Laboratory Setup including supply of electricity, water, gas and heating etc.</b> <b>Unit : set</b> To be estimated on lump-sum basis as per the requirements mentioned in the contract / under special Provisions.		
5.2	504	<b>Providing, installing and maintaining Quality control laboratory with equipment as specified in the Technical Specifications.</b> <b>Unit : set</b> To be estimated on lump-sum basis as per the requirements mentioned in the contract / under special Provisions.		
5.3	504	<b>Operation of Laboratory with Technical support of Laboratory staff</b> <b>Unit : Man- month</b> 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	<b>Field Test</b>		
5.4.1		<b>Carryout Axle load survey including all consumables and accessories.</b> <b>Unit = no. of reading</b> <b>a) Labour</b> Skilled day 1.00 Semiskilled day 2.00 Unskilled day 6.00 <b>b) Material</b> Flag ( red cloth) meter 2.00 Add 3 % Labour cost for Gloves, masks and other consumable items <b>c) Equipment</b> 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		
	<b>Remarks:</b>	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	<b>Carryout Benkelman Beam Deflection Test including all consumables and accessories.</b> <b>Unit = no of reading (For 50 point reading)</b> <b>a) Labour</b> Skilled day 2.00 Semiskilled day 4.00 Unskilled day 10.00 <b>b) Material</b>		



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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			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 <b>c) Equipment</b> 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
			<p><b>Remarks:</b></p> 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.		
5.4.3		505	<b>Carryout Field Density test of sub grade/ sub base/ base test by Sand replacement Method as per procedure mentioned in the Technical Specifications.</b> <b>Unit = nos. (For 50 Nos)</b> <b>a) Labour</b> Skilled semiskilled Unskilled <b>b) Material</b> Standard Sand ( 50 % reusable) Add 3 % Labour cost for Gloves, masks and other consumable items <b>c) Equipment</b> 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
			<p><b>Remarks:</b></p> 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.		
5.4.4		505	<b>Sampling from Subgrade, Sub base, base and Wearing Course</b> <b>Unit = nos. (For 50 Nos samples)</b> <b>a) Labour</b> 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>b) Material</b> Jute Bag Flag/ Clothes Add 3 % Labour cost for Gloves, masks and other consumable items <b>c) Equipment</b> 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><b>Remarks:</b></p> Rate obtained shall be minimum for upto 50 sampling, if the samplings are more than 50 , add additional cost of per sampling rate.		
			<b>Carryout Rapid Determination of CBR by dynamic core penetrometer as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = point (For 50 point)</b> <b>a) Labour</b> Skilled semiskilled Unskilled <b>b) Material</b>  Flag/ Clothes Add 3 % Labour cost for Gloves, masks and other consumable items <b>c) Equipment</b> Dynamic cone penetrometer Jeep/ pickup Add 3 % of Labour cost for traffic control sign, traffic cone, Brush, umbrella, clip board and other T&P	day day day  meter  day hour	1.00 1.00 2.00  2.00  1.00 8.00
5.4.6		505	<p><b>Remarks:</b></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.		
			<b>Carryout Measurement of Pavement Thickness including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = point (For 60 point)</b> <b>a) Labour</b> Skilled semiskilled Unskilled <b>b) Material</b> Flag/ Clothes Add 3 % Labour cost for Gloves, masks and other consumable items <b>c) Equipment</b>	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><b>Remarks:</b></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><b>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)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>semiskilled day 2.00</p> <p>Unskilled day 4.00</p> <p><b>b) Material</b></p> <p>Flag/ Clothes meter 2.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></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&amp;P</p>		
5.4.8	500	<p><b>Remarks:</b></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><b>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)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 4.00</p> <p>semiskilled day 8.00</p> <p>Unskilled day 80.00</p> <p><b>b) Material</b></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><b>c) Equipment</b></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		
		<b>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)</b>		
		<b>a) Labour</b>		
		semiskilled	day	8.00
		Unskilled	day	40.00
		<b>b) Material</b>		
		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		
<b>c) Equipment</b>				
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	<b>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 )</b>		
		<b>a) Labour</b>		
		Skilled	day	7.00
		semiskilled	day	21.00
		Unskilled	day	49.00
		<b>b) Material</b>		
		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				
<b>c) Equipment</b>				

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		
		<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		semiskilled	day	2.00
		Unskilled	day	2.00
		<b>b) Material</b>		
Jute Bag/ Polythene bag	nos	30.00		
Flag/ Clothes	meter	2.00		
Add 3 % Labour cost for Gloves, masks and other consumable items				
<b>c) Equipment</b>				
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				
<b>Remarks:</b>		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	<b>Carryout Schmidt Hammer Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos. (For 100 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		semiskilled	day	2.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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	Remarks:	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.		
	500, 2000	<p><b>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.)</b>  <b>Unit = nos (For 100 Mt)</b></p> <p><b>a) Labour</b>                      Skilled day 7.00                      semiskilled day 7.00                      Unskilled day 200.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      Add 3 % of Labour cost for Deflection measurement instrument, traffic control sign, traffic cone, and other T&amp;P</p>		
5.5 5.5.1	Remarks:	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.		
	505 - 508	<p><b>Laboratory Test</b>  <b>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.</b>  <b>Unit = nos (For 30 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.10                      semiskilled day 0.50                      Unskilled day 1.00</p> <p><b>b) Material</b>                      Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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><b>a) Labour</b></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>b) Material</b></p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></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><b>a) Labour</b></p> <p>Skilled day 0.75</p> <p>semiskilled day 1.00</p> <p>Unskilled day 1.50</p> <p><b>b) Material</b></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><b>c) Equipment</b></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&amp;P</p> <p><b>Carryout California Bearing Ratio ( soaked) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = nos (For 4 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p><b>b) Material</b></p> <p>Filter paper sq. ft. 3.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></p> <p>Sieves set hour 2.00</p> <p>oven hour 24.00</p> <p>Tray hour 4.00</p> <p>Can 3 Nos hour 72.00</p> <p>Balance (20 kg) hour 6.00</p> <p>Balance (1 Kg) hour 2.00</p> <p>Mould for 4 days hour 96.00</p> <p>Measuring Cylinder hour 1.00</p> <p>CBR testing Machine hour 1.00</p> <p>Water Bath hour 96.00</p> <p>Add 3 % of Labour cost for swelling device other T&amp;P</p>		
5.5.5	505 - 508	<p><b>Carryout California Bearing Ratio(uns soaked) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = nos (For 4 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p><b>b) Material</b></p> <p>Filter paper sq. ft. 3.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></p> <p>Sieves set hour 2.00</p> <p>oven hour 24.00</p> <p>Tray hour 4.00</p> <p>Can 3 Nos hour 24.00</p> <p>Balance (20 kg) hour 6.00</p> <p>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		
		<b>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.</b>		
		<b>Unit = nos (For 8 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.25
		semiskilled	day	0.50
		Unskilled	day	1.00
5.5.7	505 - 508	<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		Balance (20 kg)	hour	0.50
		CBR testing Machine	hour	2.50
		Add 3 % of Labour cost for other T&P		
		<b>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.</b>		
		<b>Unit = set (For one set i.e. 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.25
semiskilled	day	0.50		
Unskilled	day	1.00		
5.5.7	505 - 508	<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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><b>Carryout Permeability test of clayey soil (Constant head, disturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For one test)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 1.00                      Unskilled day 2.00</p> <p><b>b) Material</b>                      Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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&amp;P</p>		
5.5.9	505 - 508	<p><b>Carryout Permeability test of clayey soil (constant head, undisturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For one test)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 1.00                      Unskilled day 3.00</p> <p><b>b) Material</b>                      Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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&amp;P</p>		
5.5.10	505 - 508	<p><b>Carryout Permeability test of sandy soil (Constant head, disturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For one test)</b></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5..11	505 - 508	<b>a) Labour</b>		
		Engineer	day	0.10
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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				
		<b>Carryout Permeability test of sandy soil (constant head, undisturbed sample)including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>		
		<b>Unit = nos ( For one test)</b>		
5.5.12	505 - 508	<b>a) Labour</b>		
		Engineer	day	0.10
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
		Add 3 % Labour cost for other consumable items		
		<b>c) Equipment</b>		
		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		
				<b>Carryout Unconfined compressive strength of undisturbed cohesive soil including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>
		<b>Unit = nos (For 8 tests)</b>		
		<b>a) Labour</b>		
		Engineer	day	0.10
		Skilled	day	0.50
		semiskilled	day	0.75
		Unskilled	day	1.00
		<b>b) Material</b>		

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		
		<b>c) Equipment</b>		
		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		
		<b>Carryout Shear test of disturbed sample including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>		
		<b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Engineer	day	0.10
		Skilled	day	0.75
		semiskilled	day	1.00
		Unskilled	day	1.00
5.5.14	505 - 508	<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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
		<b>Carryout Determination of Liquid Limit and Plastic Limit including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>		
		<b>Unit = nos (For 8 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		semiskilled	day	1.00
Unskilled	day	1.00		
<b>b) Material</b>				
Add 3 % Labour cost for Gloves, masks and other consumable items				
<b>c) Equipment</b>				
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	<b>Carryout Los Angeles Abrasion Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
5.5.16	505 - 508	<b>Carryout Aggregate Impact Value Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	0.50
		Unskilled	day	1.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
5.5.17	505 - 508	<b>Carryout Determination of Flakiness Index of Aggregate and impact value including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b> <b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
5.5.17	505 - 508	<b>c) Equipment</b>		
		Aggregate Impact tester	hour	2.00
		Sieves set	hour	2.00

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	
		<b>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.</b>			
		<b>Unit = nos (For 8 tests)</b>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		semiskilled	day	1.00	
		Unskilled	day	2.00	
		<b>b) Material</b>			
		Add 3 % Labour cost for Gloves, masks and other consumable items			
		<b>c) Equipment</b>			
		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	<b>Carryout Aggregate Crushing Value Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>			
		<b>Unit = nos (For 4 tests)</b>			
		<b>a) Labour</b>			
		Skilled	day	0.50	
		semiskilled	day	1.00	
		Unskilled	day	2.00	
		<b>b) Material</b>			
		Add 3 % Labour cost for Gloves, masks and other consumable items			
		<b>c) Equipment</b>			
		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	<b>Carryout Determination of Organic Impurities of Fine Aggregate including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.21		505 - 508	<p><b>Unit = nos (For 4 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p><b>b) Material</b></p> <p>Sodium Hydroxide gm. 100.00</p> <p>Potassium Dichromate gm. 2.00</p> <p>Sulphuric Acid Lit 0.70</p> <p>Distilled Water Lit 3.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></p> <p>Tray hour 6.00</p> <p>Balance (2 kg) hour 3.00</p> <p>Container/ can hour 144.00</p> <p>Glass Bottle (500 ml, 12 Nos) hour 288.00</p> <p>Oven hour 24.00</p>		
			<p><b>Carryout Determination of Specific Gravity of Corse aggregates including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b></p> <p><b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p><b>b) Material</b></p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></p> <p>Sieves set hour 3.00</p> <p>Oven hour 24.00</p> <p>Tray 3 Nos hour 9.00</p> <p>Balance (5 kg) hour 2.00</p> <p>Density Basket hour 2.00</p> <p>Water Tank hour 2.00</p> <p>Pan/ can hour 72.00</p>		
5.5.22		505 - 508	<p><b>Carryout Stripping Value of Aggregates including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b></p> <p><b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>semiskilled day 1.00</p>		

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>b) Material</b>				
		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				
		<b>c) Equipment</b>				
		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				
		<b>Carryout Determination of Mica Content on Sand (Manually) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>				
		<b>Unit = nos (For 8 tests)</b>				
5.5.24	505 - 508	<b>a) Labour</b>				
		Skilled	day			
		semiskilled	day	0.50		
		Unskilled	day	1.00		
		<b>b) Material</b>				
		Add 3 % Labour cost for Gloves, masks and other consumable items				
		<b>c) Equipment</b>				
		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				
		<b>Carryout Sodium Sulphate soundness ( 5 cycle) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>				
<b>Unit = nos (For 4 tests)</b>						
		<b>a) Labour</b>				
		Skilled	day	1.00		
		semiskilled	day	1.50		
		Unskilled	day	1.00		
		<b>b) Material</b>				
		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	<b>c) Equipment</b>		
		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		
				<b>Carryout Sand Equivalent Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)</b>
5.5.26	505 - 508	<b>a) Labour</b>		
		Skilled	day	1.00
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		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				
		<b>c) Equipment</b>		
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				
		<b>Carryout Bulk Density Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications. Unit = nos (For 8 tests)</b>		
5.5.26	505 - 508	<b>a) Labour</b>		
		Skilled	day	0.75
		semiskilled	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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&amp;P</p> <p><b>Carryout Determination of moisture content by speedy Moisture meter including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 12 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 1.00                      semiskilled day 1.00                      Unskilled day 2.00</p> <p><b>b) Material</b>                      Calcium Carbide kg 2.00                      Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      Balance ( 1 kg) hour 3.00                      Speedy Moisture Meter hour 3.00                      M/C can 3 Nos hour 20.00</p>		
5.5.28	505 - 508	<p><b>Carryout Determination of Moisture content by Oven Dry Method including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 10 tests)</b></p> <p><b>a) Labour</b>                      Engineer day 0.25                      Skilled day 0.50                      semiskilled day 0.75                      Unskilled day 1.00</p> <p><b>b) Material</b>                      Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      Balance ( 1 kg) hour 3.00                      oven hour 24.00                      M/C can 20 Nos hour 720.00                      Tray(50*50 cm) hour 3.00</p>		
5.5.29	505 - 508	<p><b>Carryout Determination of Normal consistency of cement including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 6 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.25                      semiskilled day 0.50</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.30	505 - 508	Unskilled	day	1.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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		
5.5.31	505 - 508	<b>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.</b>		
		<b>Unit = nos (For 6 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.25
		semiskilled	day	0.50
		Unskilled	day	1.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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	<b>Making Mortar Cubes (50 mm X 50 mm) and Testing including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>		
		<b>Unit = set ( 9 Nos) [ For 3 set (27 cube)]</b>		
		<b>a) Labour</b>		
		Skilled	day	0.30
		semiskilled	day	0.50
		Unskilled	day	1.00
		<b>b) Material</b>		
		Distilled water	Lt	7.00
		Standard Sand	kg	6.30
		Add 3 % Labour cost for Gloves, masks and other consumable items		
<b>c) Equipment</b>				

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		
		<b>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.</b>		
		<b>Unit = set ( 9 Nos) [ For 3 set (27 cube)]</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
Distilled water	Lit	20.00		
Standard Sand	kg	18.00		
Add 3 % Labour cost for Gloves, masks and other consumable items				
<b>c) Equipment</b>				
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	<b>Carryout Slump test of Concrete including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>		
		<b>Unit = nos (For 18 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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&amp;P</p> <p><b>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.</b></p> <p><b>Unit = nos (For 3 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 1.00</p> <p><b>b) Material</b></p> <p>Filter Paper Sq. ft. 1.00</p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></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&amp;P</p>		
5.5.35	505 - 508	<p><b>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.</b></p> <p><b>Unit = nos (For 36 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 1.00</p> <p>Unskilled day 2.00</p> <p><b>b) Material</b></p> <p>Add 3 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b></p> <p>Compression Test Machine hour 6.00</p> <p>Balance(20 kg) hour 6.00</p>		
5.5.36	505 - 508	<p><b>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.</b></p> <p><b>Unit = nos (For 18 cube)</b></p> <p><b>a) Labour</b></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>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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		
		<b>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.</b>		
<b>Unit = nos (For 4 tests)</b>				
5.5.38	505 - 508	<b>a) Labour</b>		
		Skilled	day	1.00
		semiskilled	day	2.00
		Unskilled	day	6.00
		<b>b) Material</b>		
		Add 3 % Labour cost for Gloves, masks and other consumable items		
		<b>c) Equipment</b>		
		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		
		<b>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.</b>		
		<b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		semiskilled	day	2.00
Unskilled	day	6.00		
<b>b) Material</b>				
Add 3 % Labour cost for Gloves, masks and other consumable items				
<b>c) Equipment</b>				
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				
		<b>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.</b>				
		<b>Unit = nos (For 36 tests)</b>				
		<b>a) Labour</b>				
		Skilled	day	0.50		
		semiskilled	day	1.00		
		Unskilled	day	2.00		
<b>b) Material</b>						
		Hydrochloric Acid	Lit.	6.00		
		Antimony Chloride	gm.	200.00		
Add 10 % Labour cost for Gloves, masks and other consumable items						
<b>c) Equipment</b>						
		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	<b>Carryout Adhesion Test for Zinc Coating including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>				
		<b>Unit = nos (For 36 test)</b>				
		<b>a) Labour</b>				
				Skilled	day	0.50
				semiskilled	day	1.00
				Unskilled	day	2.00
		<b>b) Material</b>				
		Add 10 % Labour cost for Gloves, masks and other consumable items				
		<b>c) Equipment</b>				
		Add 10 % of Labour cost for Beaker, Tongs, wire cutter, mandrel , thermometer and other T&P				
5.5.41	505 - 508	<b>Carryout Uniformity Test of Zinc Coating including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>				
		<b>Unit = nos (For 36 tests)</b>				

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.42		505 - 508	<p><b>a) Labour</b>                      Skilled                      semiskilled                      Unskilled</p> <p><b>b) Material</b>                      Copper Sulphate                      Distilled water                      Cupric Hydro oxide                      Trichloroethylene                      Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      Add 10 % of Labour cost for Beaker, measuring cylinder , Tongs, wire cutter, mandrel , thermometer and other T&amp;P</p> <p><b>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.</b>  <b>Unit = nos ( For 12 tests)</b></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><b>a) Labour</b>                      Skilled                      semiskilled                      Unskilled</p> <p><b>b) Material</b>                      Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      Balance (1 kg)                      Tensile Testing Machine                      Add 10 % of Labour cost for skew gauge , wire cutter, and other T&amp;P</p> <p><b>Carryout Determination Tensile Strength Of rope/ Reinforcement Steel Bars &amp; sheets including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 6 tests)</b></p>	day day day hour hour	0.50 1.00 1.00 6.00 6.00
			<p><b>a) Labour</b>                      Skilled                      semiskilled                      Unskilled</p> <p><b>b) Material</b>                      Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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&amp;P</p> <p><b>Carryout Marshal Stability test for prepared bituminous sample including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b></p> <p><b>Unit = nos (For 12 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      Semiskilled day 1.00                      Unskilled day 1.00</p> <p><b>b) Material</b>                      Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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&amp;P</p>		6.00
5.5.45	505 - 508	<p><b>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.</b></p> <p><b>Unit = nos (For 6 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 2.00                      Unskilled day 2.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      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		
		<b>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.</b>		
		<b>Unit = nos (For 9 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		Trichloroethylene	Lit.	0.50
		Kerosene	Lit.	2.00
Add 10 % Labour cost for Gloves, masks and other consumable items				
<b>c) Equipment</b>				
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	<b>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.</b>		
		<b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		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				
<b>c) Equipment</b>				
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		
		<b>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.</b>		
		<b>Unit = nos (For 4 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		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				
<b>c) Equipment</b>				
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	<b>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.</b>		
		<b>Unit = nos (For 8 tests)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		Trichloroethylene	Lit.	0.50
		Cooking Gas	kg	2.00
		Glycerin	Lit.	0.10
		Add 10 % Labour cost for Gloves, masks and other consumable items		
<b>c) Equipment</b>				
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&amp;P</p> <p><b>Carryout Solubility Test of Bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 1.00                      Unskilled day 1.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      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&amp;P</p>		
5.5.51	505 - 508	<p><b>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.</b>  <b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 1.00                      Unskilled day 1.00</p> <p><b>b) Material</b>                      Trichloroethylene Lit. 0.50                      Glycerin Lit. 0.25</p> <p>Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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&amp;P</p>		
5.5.52	505 - 508	<p><b>Carryout Softening point test of bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b>                      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>b) Material</b>				
			Trichloroethylene	Lit.	0.25		
			Glycerin	Lit.	0.25		
			Add 10 % Labour cost for Gloves, masks and other consumable items				
			<b>c) Equipment</b>				
			Ring and Ball Apparatus	hour	3.00		
			Add 10 % Labour cost for gas stove/ heater, Thermometer, Pouring plate and other T&P				
			<b>Carryout Ductility Test of Bitumen including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>				
			<b>Unit = nos (For 8 tests)</b>				
			<b>a) Labour</b>				
			Skilled	day	0.50		
			semiskilled	day	1.00		
Unskilled	day	1.00					
<b>b) Material</b>							
Trichloroethylene	Lit.	0.25					
Glycerin	Lit.	0.25					
Add 10 % Labour cost for Gloves, masks and other consumable items							
<b>c) Equipment</b>							
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	<b>Carryout Determination of Water content in Asphalt including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>				
			<b>Unit = nos (For 8 tests)</b>				
			<b>a) Labour</b>				
			Skilled	day	0.50		
			semiskilled	day	1.00		
			Unskilled	day	1.00		
			<b>b) Material</b>				
			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				
			<b>c) Equipment</b>				
			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		
		<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		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		
		<b>c) Equipment</b>		
		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	<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.50
		semiskilled	day	1.00
		Unskilled	day	1.00
		<b>b) Material</b>		
		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		
		<b>c) Equipment</b>		
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&amp;P</p> <p><b>Carryout Determination of Viscosity of Bitumen (Kinematic) including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 4 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 1.00                      Unskilled day 1.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      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&amp;P</p>		
5.5.58	505 - 508	<p><b>Carryout Binder Content of emulsion including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b>  <b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b>                      Skilled day 0.50                      semiskilled day 0.50                      Unskilled day 1.00</p> <p><b>b) Material</b>                      Kerosene Lit. 4.00                      Xylene Lit. 0.50                      Add 10 % Labour cost for Gloves, masks and other consumable items</p> <p><b>c) Equipment</b>                      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&amp;P</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
5.5.59	505 - 508	<p><b>Carryout Determination of Residue on Sieving of Emulsion including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b></p> <p><b>Unit = nos (For 8 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 0.50</p> <p>Unskilled day 1.00</p> <p><b>b) Material</b></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><b>c) Equipment</b></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&amp;P</p>		
5.5.60	505 - 508	<p><b>Carryout Determination of Engler Viscosity Emulsion including all consumable and accessories as per test procedure mentioned in the Technical Specifications.</b></p> <p><b>Unit = nos (For 4 tests)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 0.50</p> <p>semiskilled day 0.50</p> <p>Unskilled day 1.00</p> <p><b>b) Material</b></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><b>c) Equipment</b></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&amp;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><b>Providing, jointing and laying HDPE pipes with or without collar etc. complete in place as per Drawing and Technical Specifications.</b></p> <p><b>a) 110 mm/125 mm outer dia.</b></p> <p><i>Unit = meter (For 50 meter)</i></p> <p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 3.00</p> <p><b>b) Material</b>                      HDPE pipe / HDPE pipe with collars meter 50.00</p> <p><b>c) Equipment</b>                      Generator hour 6.00                      screw Jack hour 6.00                      Electric heating plate hour 6.00                      Add 3 % of Labour cost for other T&amp;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><b>Providing and Laying Reinforced Cement Concrete Flush jointed Pipe for culverts</b></p> <p><b>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.</b></p> <p><i>Unit = meter (For 12.5 m. 5 pipes of 2.5 m length each)</i></p> <p><b>300 mm internal dia.</b></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 5.00</p> <p><b>b) Material</b>                      Sand cum 0.08                      Cement tonne 0.06                      RCC pipe meter 12.50</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&amp;P</p>		
	B		<p><b>450 mm internal dia.</b></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 6.00</p> <p><b>b) Material</b>                      Sand cum 0.09                      Cement tonne 0.07                      RCC pipe meter 12.50</p> <p><b>c) Equipment</b></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&amp;P</p> <p><b>600 mm internal dia.</b></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 7.00</p> <p><b>b) Material</b>                      Sand cum 0.10                      Cement tonne 0.08                      RCC pipe meter 12.50</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&amp;P</p>		
	D		<p><b>900 mm internal dia.</b></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 8.00</p> <p><b>b) Material</b>                      Sand cum 0.12                      Cement tonne 0.09                      RCC pipe meter 12.50</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&amp;P</p>		
	E		<p><b>1000 mm internal dia.</b></p> <p><b>a) Labour</b>                      Skilled day 1.50                      Unskilled day 10.00</p> <p><b>b) Material</b>                      Sand cum 0.14                      Cement tonne 0.10                      RCC pipe meter 12.50</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&amp;P</p>		
	F		<p><b>1200 mm internal dia.</b></p> <p><b>a) Labour</b>                      Skilled day 2.00                      Unskilled day 12.00</p> <p><b>b) Material</b>                      Sand cum 0.18                      Cement tonne 0.14                      RCC pipe meter 12.50</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&amp;P</p>		
	<b>Remarks</b>		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.					
			<b>Providing and Laying Reinforced Cement Concrete Pipe for culverts including fixing collar</b>					
			<b>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.</b>					
			<i>Unit = meter (For 12.5 m, 5 pipes of 2.5 m length each)</i>					
			<b>300 mm internal dia.</b>					
			<b>a) Labour</b>					
			Skilled	day	1.00			
			Unskilled	day	5.00			
			<b>b) Material</b>					
			Sand	cum	0.08			
			Cement	tonne	0.06			
			RCC pipe	meter	12.50			
			RCC Collar	nos.	4.00			
			<b>c) Equipment</b>					
Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P								
B	A	701	<b>450 mm internal dia.</b>					
			<b>a) Labour</b>					
			Skilled	day	1.00			
			Unskilled	day	6.00			
			<b>b) Material</b>					
			Sand	cum	0.09			
			Cement	tonne	0.07			
			RCC pipe	meter	12.50			
			RCC Collar	nos.	4.00			
			<b>c) Equipment</b>					
			Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P					
			C	A	701	<b>600 mm internal dia.</b>		
						<b>a) Labour</b>		
						Skilled	day	1.00
						Unskilled	day	7.00
<b>b) Material</b>								
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
	<b>D</b>		<b>c) Equipment</b> Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P  <b>900 mm internal dia.</b>		
			<b>a) Labour</b> Skilled	day	1.00
			Unskilled	day	8.00
			<b>b) Material</b> Sand	cum	0.12
			Cement	tonne	0.09
			RCC pipe	meter	12.50
			RCC Collar	nos.	4.00
	<b>E</b>		<b>c) Equipment</b> Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P  <b>1000 mm internal dia.</b>		
			<b>a) Labour</b> Skilled	day	1.50
			Unskilled	day	10.00
			<b>b) Material</b> Sand	cum	0.14
			Cement	tonne	0.10
			RCC pipe	meter	12.50
			RCC Collar	nos.	4.00
	<b>F</b>		<b>c) Equipment</b> Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P  <b>1200 mm internal dia.</b>		
			<b>a) Labour</b> Skilled	day	2.00
			Unskilled	day	12.00
			<b>b) Material</b> Sand	cum	0.18
			Cement	tonne	0.14
			RCC pipe	meter	12.50
			RCC Collar	nos.	4.00
	<b>Remarks</b>		<b>c) Equipment</b> Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&P  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><b>Providing and laying concrete channeling as per Drawing and Technical Specifications.</b>  <b>A</b>                      Cast in situ                      Refer Rate analysis of concrete items</p> <p><b>B</b>  <b>Pre cast</b>                      Refer Rate analysis of concrete items</p> <p><b>C</b>  <b>Laying (Joining) of Precast concrete panel</b>  <i>Unit = meter [For 12 m. ( 2 nos 60 cm wide and 60 cm deep channel) of perimeter</i></p> <p><b>a) Labour</b>                      Skilled day 0.50                      Unskilled day 3.00</p> <p><b>b) Material</b>                      Sand cum 0.04                      Cement tonne 0.03                      Concrete channel nos.</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for bellies, crow bars, chain pulley and other T&amp;P</p>		
	<b>Remarks</b>		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.		

**SECTION - 800 COLLECTION AND TRANSPORTATION OF**

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

NORMS FOR RATE ANALYSIS

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



NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.5	A		<p>Add 3 % of Labour cost for Tools and Plants</p> <p><b>Manually Breaking stones ( excluding Collection of Rubble)</b></p> <p><b>70 mm - 100 mm</b> Unit = cum (For 1 cum)</p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Equipment</b> Add 3 % of Labour cost for Tools and Plants</p>	day	1.50
	B		<p><b>40 mm - 70 mm</b> Unit = cum (For 1 cum)</p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Equipment</b> Add 3 % of Labour cost for Tools and Plants</p>	day	2.00
	C		<p><b>20 mm - 40 mm</b> Unit = cum (For 1 cum)</p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Equipment</b> Add 3 % of Labour cost for Tools and Plants</p>	day	3.00
	D		<p><b>10 mm - 20 mm</b> Unit = cum (For 1 cum)</p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Equipment</b> Add 3 % of Labour cost for Tools and Plants</p>	day	4.00
	E		<p><b>10 mm</b> Unit = cum (For 1 cum)</p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Equipment</b> Add 3 % of Labour cost for Tools and Plants</p>	day	6.00
8.6	A		<p><b>Mechanically Crushing of Stone Aggregates</b></p> <p><b>13.2 mm Nominal Size.</b> 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)</p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	B		<p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Stone Boulder of size 150 mm and below</p> <p><b>c) Equipment</b>                      Stone crusher with screen                      Loader                      Tipper</p> <p><b>20 mm Nominal Size</b>                      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><b>Unit = cum (For 670 cum at crusher location)</b></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Stone Boulder</p> <p><b>c) Equipment</b>                      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><b>40 mm Nominal Size</b>                      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><b>Unit = cum (For 750 cum at crusher location.)</b></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Stone Boulder</p> <p><b>c) Equipment</b>                      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><b>Making rubbles of required size including and stacking.</b>  <b>with blasting and breaking with chisel or hammer,</b></p>		

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
8.8	B		<p><b>Unit = cum ( For 1 cum)</b></p> <p><b>a) Labour</b></p> <p>Skilled ( Blaster) day 0.10</p> <p>Unskilled day 2.50</p> <p><b>b) Material</b></p> <p>Gelatin kg 0.25</p> <p>Detonator no 2.00</p> <p>Fuse wire meter 2.00</p> <p><b>b) Equipment</b></p> <p>Add 3 % of Labour cost for traffic control sign and other T&amp;P</p> <p><b>With chisel or hammer, and stacking ( without blasting).</b></p> <p><b>Unit = cum ( For 1 cum)</b></p> <p><b>a) Labour</b></p> <p>Skilled ( Blaster) day 0.10</p> <p>Unskilled day 4.00</p> <p><b>b) Material</b></p> <p><b>c) Equipment</b></p> <p>Add 3 % of Labour cost for traffic control sign and other T&amp;P</p>		
		Remarks:	<p><b>Haulage of Stone Boulder/ aggregates/ Sand/ excavated earth etc.</b></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><b>a) Labour</b></p> <p>Unskilled day 0.20</p> <p><b>b) Equipment</b></p> <p>Add 3 % of Labour cost for traffic control sign and other T&amp;P</p>		
8.9	A		<p><b>Loading and Unloading of Stone Boulder/ aggregates/ Sand/ excavated earth etc. by Mechanical; means</b></p> <p><b>Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip</b></p> <p><b>Unit = cum (For 5.5 cum)</b></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
			<b>a) Equipment</b> Tipper Loader	hour hour	0.33 0.33
	<b>Remarks:</b>		Unloading will be by tipping.		
	B		<b>by Manual Means</b> <b>Unit = cum [For 44 cum (8 trip per day having 5.5 cum each)]</b>		
			<b>a) Labour</b> Unskilled	day	6.00
			<b>b) Equipment</b> Tipper	hour	6.00
	<b>Remarks:</b>		Unloading will be by tipping.		
<b>8.10</b>			<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b> <b>Unit = tonne (For 10 tones)</b>		
			<b>a) Labour</b> Unskilled	day	2.00
			<b>b) Equipment</b> Truck	hour	2.00
<b>8.11</b>			<b>Loading, Unloading and Stacking of Bricks by Manual Means</b> <b>Unit = 1000 Nos. (For 8 * 2000 nos.)</b>		
			<b>a) Labour</b> Unskilled	day	3.00
			<b>b) Equipment</b> Truck	hour	6.00
<b>8.12</b>			<b>Loading and Unloading of Bitumen Drums by Manual Means</b> <b>Unit = tonne (For 40 tonnes)</b>		
			<b>a) Labour</b> Unskilled	day	6.00
			<b>b) Equipment</b> Truck	hour	6.00
<b>8.13</b>			<b>Loading and Unloading of Timber by Manual Means</b> <b>Unit = tonne (for 30 tonnes)</b>		
			<b>a) Labour</b> Skilled	day	1.00

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
8.14			Unskilled	day	8.00	
			<b>b) Equipment</b> 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.			
			<b>Loading and Unloading of C.C. Blocks, Kerb, etc.</b> <b>Unit = cum (For 20 cum)</b>			
			<b>a) Labour</b>			
			Skilled	day	1.00	
			Unskilled	day	8.00	
			<b>b) Equipment</b>			
			Truck	hour	6.00	
8.15	i A		<b>Loading and Unloading of RCC Hume Pipes</b>			
			<b>Loading of RCC Hume pipes by mechanical means including a lead upto 30 m</b>			
			<b>900/ 1000 / 1200 mm dia RCC Hume pipe</b>			
			<b>Unit = meter [For 6 nos pipe / length=15 m]</b>			
			<b>a) Labour</b>			
			Skilled	day	0.50	
	Unskilled	day	2.00			
	<b>b) Equipment</b>					
	Truck	hour	1.00			
	Crane (3 T)	hour	1.00			
		B		<b>750/600/450 mm dia RCC Hume pipe</b>		
	<b>Unit = meter [For 10 nos pipe/ length= 25 m]</b>					
<b>a) Labour</b>						
Skilled	day			0.50		
Unskilled	day			2.00		
<b>b) Equipment</b>						
Truck	hour	1.00				
Crane	hour	1.00				
	C		450/300 mm dia RCC Hume pipe			
<b>Unit = meter [For 15 nos pipe/ length= 37.5 m]</b>						
<b>a) Labour</b>						
Skilled			day	0.50		
Unskilled			day	2.00		
<b>b) Equipment</b>						
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		<b>Unloading of RCC Hume pipes by mechanical means including a lead upto 30 m</b>			
			<b>900/1000/1200 mm dia RCC Hume pipe</b>			
			<b>Unit = meter [For 6 nos pipe /length=15 m]</b>			
			<b>a) Labour</b>			
			Skilled	day	0.10	
			Unskilled	day	1.00	
	<b>b) Equipment</b>					
	Truck		hour	0.50		
	Crane		hour	0.50		
	B			<b>750/600 mm dia RCC Hume pipe</b>		
				<b>Unit = meter [For 10 nos pipe / length = 25 m]</b>		
			<b>a) Labour</b>			
Skilled		day	0.50			
Unskilled		day	1.00			
<b>b) Equipment</b>						
Truck	hour	0.50				
Crane	hour	0.50				
C		<b>450/300 mm dia RCC Hume pipe</b>				
		<b>Unit = meter [For 15 nos pipe / length= 37.5 m]</b>				
	<b>a) Labour</b>					
	Skilled	day	0.10			
	Unskilled	day	1.00			
	<b>b) Equipment</b>					
Truck	hour	0.50				
Crane	hour	0.50				
iii	A		<b>Loading of RCC Hume pipe by manual means including a lead upto 30 m</b>			
			<b>900/1000/1200 mm dia RCC Hume pipes</b>			
			<b>Unit = meter [For 6 nos pipe / length= 15 m]</b>			
			<b>a) Labour</b>			
			Skilled	day	0.30	
			Unskilled	day	3.00	
	<b>b) Equipment</b>					
	Truck		hour	4.00		
	<b>c) Material</b>					
	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					
	B			<b>750/600 mm dia RCC Hume pipe</b>		
		<b>Unit = meter [For 10 nos pipe/ length= 25 m]</b>				
	<b>a) Labour</b>					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Skilled	day	0.30
			Unskilled	day	4.00
			<b>b) Equipment</b>		
			Truck	hour	4.00
			<b>c) Material</b>		
			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		<b>450 / 300 mm dia RCC Hume pipe</b> <b>Unit = meter [For 15 nos pipe/ length= 37.5 m]</b>		
			<b>a) Labour</b>		
			Skilled	day	0.30
			Unskilled	day	5.00
			<b>b) Equipment</b>		
			Truck	hour	4.00
			<b>c) Material</b>		
			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		<b>Unloading of RCC Hume pipe by manual means including a lead upto 30 m</b>		
	A		<b>900/1000/1200 mm dia RCC Hume pipes</b> <b>Unit = meter [For 6 nos pipe / length= 15 m]</b>		
			<b>a) Labour</b>		
			Skilled	day	0.30
			Unskilled	day	1.50
			<b>b) Equipment</b>		
			Truck	hour	3.00
			<b>c) Material</b>		
			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		<b>750/600 mm dia RCC Hume pipe</b> <b>Unit = meter [For 10 nos pipe / length= 25 m]</b>		
			<b>a) Labour</b>		
			Skilled	day	0.30
			Unskilled	day	1.50
			<b>b) Equipment</b>		
			Truck	hour	3.00
			<b>c) Material</b>		
			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><b>450 / 300 mm dia RCC Hume pipe</b>                      Unit = meter [For 15 nos pipe / length=37.5 m]</p> <p><b>a) Labour</b>                      Skilled day 0.30                      Unskilled day 1.50</p> <p><b>b) Equipment</b>                      Truck hour 3.00</p> <p><b>c) Material</b>                      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&amp;P</p>											
			<p><b>Cost of Haulage Excluding Loading and Unloading</b>  <b>Haulage of materials by tipper excluding cost of loading, unloading and stacking.</b>                      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>20</td> <td>30</td> <td>40</td> </tr> <tr> <td></td> <td>10</td> <td>15</td> <td>20</td> </tr> </table>		ER	GR	BT	Speed of loaded truck	20	30	40		10	15
	ER	GR	BT											
Speed of loaded truck	20	30	40											
	10	15	20											
	(i)		<p>Speed of Empty truck =25 % more than loaded truck of corresponding terrain  <b>Blacktop Road, hilly terrain</b>                      Speed with load : 20 km / hour.                      Speed while Returning empty : 25 km / hour.</p> <p><b>a) Equipment.</b>                      Tipper                      Time taken for onward haulage with load hour 0.50                      Time taken for empty return trip. hour 0.40</p>											
	(ii)		<p><b>Graveled Road, hilly terrain</b>                      Speed with load: 15 km / hour                      Speed for empty return trip :18.75 km / hour</p> <p><b>a) Equipment</b>                      Tipper  <b>Time taken for onward haulage with load</b> hour 0.67  <b>Time taken for empty return trip</b> hour 0.53</p>											
	(iii)		<p><b>Earthen Track and Track in River Bed/Nallah Bed , hilly terrian</b>                      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
		<b>a) Equipment</b> Tipper Time taken for onward haulage Time taken for empty return trip	hour hour	1.00 0.80
(iv)		<b>Blacktop Road, Terai terrain</b> Speed with load : 40 km / hour. Speed while Returning empty : 50 km / hour.		
		<b>a) Equipment.</b> Tipper Time taken for onward haulage with load Time taken for empty return trip.	hour hour	0.25 0.20
(v)		<b>Graveled Road, Terai terrain</b> Speed with load: 30 km / hour Speed for empty return trip : 37.5 km / hour		
		<b>a) Equipment for transportation</b> Tipper Time taken for onward haulage with load Time taken for empty return trip	hour hour	0.33 0.27
(vi)		<b>Earthen Track and Track in River Bed/Nallah Bed , Terai</b> Speed with load : 20 km / hour Speed while returning empty: 25 km / hour		
		<b>a) Equipment for transportation</b> Tipper Time taken for onward haulage Time taken for empty return trip	hour hour	0.50 0.40
	<b>Remarks:</b>	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	<b>Earthwork Excavation in Cutting.</b>		
			<b>Roadway Excavation in All types of Soil</b>		
	<b>Roadway Excavation in all types of Soil by Manual Means .</b>				
	<b>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.</b> <i>Unit = cum (For 12 cum)</i>				
			a) <b>Labour</b>		
			Skilled	day	1.00
			Unskilled	day	8.00
			b) <b>Equipment</b>		
			Doko , Thunse etc. @ 3 % of Labour cost		
	B		<b>Roadway Excavation in all types of Soil by Mechanical Means .</b>		
			<b>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.</b> <i>Unit = cum (For 360 cum)</i>		
			a) <b>Labour</b>		
			Skilled	day	1.00
			Unskilled	day	3.00
			b) <b>Equipment</b>		
			Hydraulic excavator	hour	6.00
	II A		<b>Roadway Excavation in Ordinary Rock</b>		
			<b>Roadway Excavation in ordinary rock by Manual Means .</b>		
			<b>Roadway Excavation in ordinary rock as per Drawing and Technical specification, including all lift and lead as per Drawing and instruction of the Engineer.</b> <i>Unit = cum (For 60 cum)</i>		
			a) <b>Labour</b>		
			Skilled	day	3.00
			Unskilled	day	50.00
			b) <b>Equipment</b>		
			Doko , Thunse etc. @ 3 % of Labour cost		
	B		<b>Roadway Excavation in ordinary rock by Mechanical Means .</b>		

NORMS FOR RATE ANALYSIS

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

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
	A		<p><b>Roadway Excavation in hard rock with rock breakers, including breaking rock, lifts and lead for disposal as per Drawing and Technical Specifications</b>  <b>Mechanical method, lead upto 30 m</b>  <i>Unit = cum (For 16 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 1.00                      Unskilled day 10.00</p> <p>b) <b>Equipment</b>                      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><b>Roadway Excavation in hard rock manually chiseling including breaking rock, lifts and lead for disposal as per Drawing and Technical Specifications ,</b>  <i>Unit = cum (For 16 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 2.00                      Unskilled day 58.00                      Blacksmith day 1.00</p> <p>b) <b>Equipment</b>                      Crow bar and other T &amp; 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><b>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</b>  <i>Unit = cum (For 16 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 2.00                      Unskilled day 16.00</p> <p>b) <b>Material</b>                      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) <b>Equipment</b>                      Crow bar and other T &amp; P @ 3 % of Labour</p>		
	V		<p><b>Excavation in Marshy Soil</b>  <b>Roadway Excavation in marshy soil as per Drawing and Technical Specifications</b>  <i>Unit = cum (For 300 cum)</i></p> <p>a) <b>Labour</b></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>b) Equipment</b>		
		Hydraulic excavator	hour	6.00
		Tipper	hour	18.00
		<b>Remarks for Activities of 9.1 :</b>		
		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 <b>in case of use of Blasting ( explosive) material add Cost for security personal for handling and storage of explosive</b>		
		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	<b>Removal of Unserviceable Soil with Disposal upto 1000 meters</b> <b>Removal of unserviceable soil including excavation, loading and disposal upto 1000 meters lead</b>  <i>Unit = cum (For 360 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	4.00
		<b>b) Equipment</b>		
		Excavator	hour	6.00
		Tipper	hour	18.00
	<b>Remarks</b>	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	<b>Trimming/ Rock Excavation Slopes</b>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity
			<p><b>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.</b>  <i>Unit = sqm [For 400 sqm( 120 cum considering 300 mm deep excavation on rock face)]</i></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 22.00</p> <p><b>b) Material</b>                      Gelatin kg 42.00                      Electric Detonators nos. 672.00</p> <p><b>c) Equipment</b>                      Air compressor hour 6.00                      Jack hammer /Rock drill hour 30.00                      Dozer hour 6.00                      Loader hour 6.00</p>		
			<p><b>Remarks</b></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><b>Excavation for Structures Foundation</b>  <b>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.</b>  <b>Ordinary soil</b>  <b>Manual Means</b>  <i>Unit = cum (For 10 cum)</i>  <b>Depth upto 3 m</b></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 8.00</p>		
	I A (i)		<p><b>Remarks</b></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><b>Depth 3 m to 6 m</b></p> <p>a) <b>Labour</b></p> <p>Skilled</p> <p>Unskilled</p>	<p>day</p> <p>day</p>	<p>1.00</p> <p>12.00</p>
	<b>Remarks</b>	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><b>Depth above 6 m</b></p> <p>a) <b>Labour</b></p> <p>Skilled</p> <p>Unskilled</p>	<p>day</p> <p>day</p>	<p>2.00</p> <p>18.00</p>
	<b>Remarks</b>	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>B</b>	<b>Mechanical Means</b>		
	(i)	<p><b>Depth upto 3 m</b></p> <p><i>Unit = cum (for 240 cum)</i></p> <p>a) <b>Labour</b></p> <p>Skilled</p> <p>Unskilled</p> <p>b) <b>Equipment</b></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>
	<b>Remarks</b>	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><b>Depth 3 m to 6 m</b></p> <p><i>Unit = cum (For 210 cum)</i></p> <p>a) <b>Labour</b></p> <p>Skilled</p> <p>Unskilled</p> <p>b) <b>Equipment</b></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>
	<b>Remarks</b>	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><b>Depth above 6 m</b>  <i>Unit = cum (For 180 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 2.00                      Unskilled day 4.00</p> <p>b) <b>Equipment</b>                      Hydraulic excavator hour 6.00</p>		
	Remarks	<p>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><b>Ordinary Rock (not requiring blasting)</b>  <b>Manual Means</b>  <b>Depth upto 3 m</b>  <i>Unit = cum (For 10 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 1.00                      Unskilled day 10.00</p>		
	Remarks	<p>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><b>Mechanical Means</b>  <i>Unit = cum (For 90 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 1.00                      Unskilled day 3.00</p> <p>b) <b>Equipment</b>                      Hydraulic excavator hour 6.00</p>		
	Remarks	<p>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><b>Hard Rock ( requiring blasting )</b>  <b>Manual Means</b>  <i>Unit = cum (For 10 cum)</i></p> <p>a) <b>Labour</b>                      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>b) Material</b> Gelatin kg 3.50 Detonator electric nos 14.00 fuse wire m 20.00 <b>c) Equipment</b> Air Compressor hour 1.00 Jack hammer /Rock drill hour 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		<b>Hard Rock ( blasting prohibited )</b>		
		<i>Unit = cum (For 10 cum)</i>		
A		<b>Mechanical Means</b>		
		<b>a) Labour</b>		
		Skilled day 1.00		
		Unskilled day 10.00		
		<b>b) Equipment</b>		
		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		<b>Marshy Soil</b>		
		<i>Unit = cum (For 10 cum)</i>		
		<b>Depth upto 3 m</b>		
A		<b>Manual means</b>		
		<b>a) Labour</b>		
		Skilled day 1.00		
		Unskilled day 15.00		
		<b>b) Equipment</b>		
		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		<b>Mechanical Means</b>		
		<b>a) Labour</b>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
		Skilled	day	0.08
		Unskilled	day	4.00
		<b>b) Equipment</b>		
		Hydraulic excavator	hour	0.30
		Tipper	hour	1.00
	<b>Remarks</b>	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		
	<b>VI</b>	<b>Back Filling in Marshy Foundation Pits</b> <i>Unit : Cum (For 18 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	12.00
		<b>b) Equipment</b>		
		Tractor-trolley for transportation	hour	6.00
<b>9.5</b>	<b>905</b>	<b>Stripping and Storing Top Soil</b> <b>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.</b> <i>Unit = cum (For 300 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	10.00
		<b>b) Equipment</b>		
		Dozer	hour	6.00
<b>9.6</b>	<b>909</b>	<b>Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields.</b> <b>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.</b> <i>Unit = cum (For 150 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	15.00
		<b>b) Equipment</b>		
		Dozer	hour	6.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of works / Resources	Unit	Quantity
9.7	909, 910	<p><b>Preparation and Surface Treatment of Formation.</b></p> <p><b>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.</b>  <i>Unit = sqm ( For 3500 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled day 1.00                      Unskilled day 10.00</p> <p>b) <b>Equipment</b>                      Roller hour 6.00</p> <p>c) <b>Material</b>                      Cost of water KL 18.00</p>		
9.8	909, 910	<p><b>Construction of Embankment with Material obtained from Borrow pits</b>  <b>Providing, laying, spreading and compacting embankment with borrow material as per Drawing and Technical Specifications.</b>  <i>Unit = cum (For 300 cum)</i></p> <p>a) <b>Labour</b>                      Skilled day 1.00                      Unskilled day 4.00</p> <p>b) <b>Material</b>                      Cost of water KL 72.00                      Borrowpit material cum 360.00</p> <p>c) <b>Equipment</b>                      Hydraulic Excavator hour 6.00                      Tractor with rotavator hour 12.00                      Dozer hour 3.00                      Motor grader hour 3.00</p> <p>Vibratory roller hour 6.00</p>		
	<b>Remarks</b>	<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	<p><b>Construction of Embankment with Material Deposited from Roadway Cutting</b></p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS.	Description of works / Resources	Unit	Quantity	
9.10	A		<b>Providing, laying, spreading and compacting embankment with roadway cutting material and compact to the required density as per Drawing and Technical Specifications.( Manually)</b> <i>Unit = cum (For 100 cum)</i>			
			<b>a) Labour</b>			
			Skilled	day	2.00	
			Unskilled	day	50.00	
			<b>b) Material</b>			
	Cost of water	KL	24.00			
	<b>c) Equipment</b>					
	Vibratory roller	hour	6.00			
	B			<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)</b> <i>Unit = cum (For 300 cum)</i>		
				<b>a) Labour</b>		
Skilled				day	1.00	
Unskilled				day	10.00	
<b>b) Material</b>						
Cost of water	KL	72.00				
<b>c) Equipment</b>						
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.			
			<b>Construction of Rock fill Embankment</b> 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>			
			<b>a) Labour</b>			

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>b) Material</b>			
			Cost of water	KL	12.00	
			<b>c) Equipment</b>			
			Dozer	hour	6.00	
			Vibratory road roller	hour	6.00	
			<b>Remarks</b>	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		
			<b>Providing suitable material and Back filling behind abutment, wing wall and return wall complete as per Drawing and Technical Specifications.</b>			
			<i>Unit = cum (for 10 cum)</i>			
			<b>Granular Material</b>			
			<b>a) Labour</b>			
			Skilled	day	0.20	
			Unskilled	day	5.00	
			<b>b) Material</b>			
Granular Material	cum	11.00				
Cost of water	KL	1.00				
<b>c) Equipment</b>						
Plate compactor/power rammer	hour	2.50				
<b>B</b>						
<b>Sandy Material</b>						
<b>a) Labour</b>						
Skilled	day	0.20				
Unskilled	day	5.00				
<b>b) Material</b>						
Sand	cum	12.00				
Cost of water	KL	1.00				
<b>c) Equipment</b>						
Plate compactor/power rammer	hour	2.50				
<b>C</b>						
<b>Locally available Material including compaction by tamping rod ( without watering)</b>						
<b>a) Labour</b>						
Skilled	day	0.20				
Unskilled	day	5.00				
<b>b) Material</b>						
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 <b>c) Equipment</b> Tamping 3 % of Labour cost	KL	1.00
	<b>D</b>		<b>Locally available Material, with out watering and compaction by tamping rod</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Locally available Material <b>c) Equipment</b> Tamping 3 % of Labour cost	day day cum	0.20 4.00 12.00
		<b>Remarks</b>	Cost of earthwork excavation shall be added only in case of the material obtained from excavation is not sufficient for backfilling.		
<b>9.12</b>		<b>909, 910</b>	<b>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.</b> <i>Unit = cum (For 10 cum.)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Filter media Cost of water	day day cum KL	1.00 10.00 12.00 1.00
<b>9.13</b>		<b>908</b>	<b>Providing and filling sand in Foundation Trenches as per Drawing &amp; Technical Specification</b> <i>Unit = cum (For 1 cum)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Scarifying Existing road Surface to a Depth of 50 mm by Manual Means</b> 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> a) <b>Labour</b> Skilled Unskilled b) <b>Equipment</b> Tractor-trolley / Truck	day day hour	1.00 15.00 6.00
	B		<b>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.</b> <i>Unit = sqm (For 600 sqm, Lead upto 30 m)</i> a) <b>Labour</b> Skilled Unskilled	day day	1.00 12.00
	<b>Remarks</b>		In case Material is not to be reused at site, transportation cost catered above for disposal may be added.		
10.2		1003	<b>Scarifying Existing road Surface to a depth of 50 mm by Mechanical Means</b>		
10.2	A		<b>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.</b> <i>Unit = sqm (For 600 sqm, lead upto 30 m)</i> a) <b>Labour</b> Skilled Unskilled b) <b>Equipment</b> Tractor with ripper	day day hour	1.00 6.00 6.00
	B		<b>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.</b> <i>Unit = sqm (For 3000 sqm)</i> a) <b>Labour</b> Skilled Unskilled b) <b>Equipment</b> Tractor with ripper Loader Tipper	day day hour hour hour	1.00 6.00 6.00 6.00 6.00
	<b>Remarks</b>		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><b>Construction of Subgrade and Earthen Shoulders with approved Material ( capping layer)</b>                      Providing and laying sub-grade and earthen shoulders with approved Material obtained from borrow pits with all lifts &amp; leads as per Drawing and Technical Specifications.  <i>Unit = cum (For 600 cum)</i></p> <p>a) <b>Labour</b>                      Skilled                      Unskilled</p> <p>b) <b>Material</b>                      Cost of water                      capping layer material</p> <p>c) <b>Equipment</b>                      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><b>Compacting Original Ground</b>  <b>Compacting original ground supporting sub-grade</b>  <b>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.</b>  <i>Unit = cum (For 600 cum)</i></p> <p>a) <b>Labour</b>                      Skilled                      Unskilled</p> <p>b) <b>Material</b>                      Cost of water</p> <p>c) <b>Equipment</b>                      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><b>Compacting original ground supporting embankment</b>  <b>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.</b>  <i>Unit = cum (For 600 cum)</i></p> <p>a) <b>Labour</b>                      Skilled                      Unskilled</p> <p>b) <b>Material</b>                      Cost of water</p> <p>c) <b>Equipment</b>                      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><b>Lime Stabilization for Improving Sub-grade</b></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>			
			<b>By Mechanical Means</b>			
			<b>a) Labour</b>			
			Skilled	day	2.00	
			Unskilled	day	12.00	
			<b>b) Material</b>			
			Lime	tonne	15.75	
			Cost of water	KL	72.00	
			<b>c) Equipment</b>			
			Tractor with ripper and rotator	hour	12.00	
	Motor Grader	hour	6.00			
	Vibratory roller	hour	6.00			
	B			<b>By Manual Means</b> <i>Unit = cum (For 150 cum (263 tones))</i>		
				<b>a) Labour</b>		
				Skilled	day	3.00
				Unskilled	day	50.00
				<b>b) Material</b>		
				Lime	tonne	8.00
				Cost of water	KL	36.00
				<b>c) Equipment</b>		
Vibratory roller				hour	6.00	
			<b>Cement Stabilization / Ecological Road pavement</b>			
			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>			
			<b>a) Labour</b>			
			Engineer	day	1.00	
			Skilled	day	2.00	
			Unskilled	day	30.00	
			<b>b) Material</b>			
			Cement	tonne	12.00	
			sand	cum	32.00	
			Cost of water	KL	12.00	
			<b>c) Equipment</b>			
			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.		
		<b>Polymer based Stabilization</b>		
		<b>Providing , laying and spreading Polymer based stabilizer, mixing, grading and compacting to form a layer of sub grade as per Drawing and Technical Specifications.</b>		
		<i>Unit = cum [For 200 cum ]</i>		
		<b>a) Labour</b>		
		Engineer	day	1.00
		Skilled	day	2.00
		Unskilled	day	10.00
		<b>b) Material</b>		
		Polymer based Admixture	Lit	32.00
Cost of water	KL	20.00		
10.8		<b>c) Equipment</b>		
		Tractor with ripper and rotator	hour	6.00
		Motor Grader	hour	6.00
		Smooth wheel Roller	hour	6.00
		<b>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.</b>		
10.9		<i>Unit = cum [For 5 cum]</i>		
		<b>a) Labour</b>		
		Skilled	day	6.00
		Unskilled	day	12.00
		<b>b) Material</b>		
Stone	cum	6.00		
10.9		<b>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.</b>		
		<i>Unit = sqm [For 5 sqm]</i>		
		<b>a) Labour</b>		
		Skilled	day	0.10
		Unskilled	day	2.00
<b>b) Material</b>				
Stone	cum	0.60		

**SECTION - 1100 OVERALL REQUIREMENT**

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			<p><b>No separate payment Cost included in related Activities</b></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><b>Providing and laying Granular Sub-Base Material By Mechanical means</b>  <b>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.</b></p> <p><i>Unit = cum (For 300 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 2.00                      Unskilled day 12.00</p> <p><b>b) Material</b>                      Sub-base Material S1 type or S2 type cum 384.00                      Cost of water KL 18.00</p> <p><b>c) Equipment</b>                      Motor Grader hour 6.00                      Vibratory roller hour 12.00                      Tractor /Loader hour 12.00</p>		
	Remarks		Select any one of the type of sub base Material as per design		
	B		<p><b>By manual Means</b>  <b>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.</b></p> <p><i>Unit = cum (For 200 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 2.00                      Unskilled day 60.00</p> <p><b>b) Material</b>                      Sub-base Material S1 type or S2 type cum 256.00                      Cost of water KL 23.00</p> <p><b>c) Equipment</b>                      Vibratory roller hour 6.00</p>		
	Remarks		Select any one of the type of sub base Material as per design		
12.2		1202	<p><b>Cement Treated Soil Sub Base/ Base</b>  <b>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.</b></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><b>For 4 per cent quantity of cement by weight of soil</b></p> <p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 15.00</p> <p><b>b) Material</b>                      soil/ borrowpit material cum 384.00                      Cement tonne 21.00                      Cost of water KL 72.00</p> <p><b>c) Equipment</b>                      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><b>Cement Treated Crushed Rock having grading requirement as per specification for Sub base/ Base</b></p> <p><b>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.</b></p> <p><i>Unit = cum [For 300 cum (600 tones)</i></p>		
12.4	907	<p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 15.00</p> <p><b>b) Equipment</b>                      Motor Grader hour 6.00                      Vibratory roller hour 6.00                      Tractor / Loader hour 12.00</p> <p><b>c) Material</b>                      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><b>Remarks</b></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><b>Making 50 mm x 50 mm Furrows</b>  <b>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 .</b></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> <b>25 mm deep furrow cutting</b>		
			<b>a) Labour</b>		
			Skilled	day	1.00
			Unskilled	day	8.00
			<b>b) Equipment</b>		
			Tractor-trolley	hour	6.00
			<b>Inverted Choke</b>		
			<b>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.</b>		
			<i>Unit = cum (For 600 cum)</i>		
			<b>a) Labour</b>		
Skilled	day	3.00			
Unskilled	day	21.00			
<b>b) Material</b>					
Screening / coarse sand	cum	720.00			
Cost of water	KL	108.00			
<b>c) Equipment</b>					
Motor Grader	hour	6.00			
Vibratory roller	hour	6.00			
12.6	A	1203	<b>Water Bound Macadam</b>		
			<b>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.</b>		
			<b>By Manual Means</b>		
			<i>Unit = cum (For 360 cum)</i>		
			<b>a) Labour</b>		
			Skilled	day	10.00
			Unskilled	day	375.00
			<b>b) Material</b>		
			Aggregate (Grading as per specification)	cum	435.60
			<b>Stone Screening</b>		
13.2 mm	cum	57.60			
<b>OR</b>					
11.2 mm for grading-II	cum	86.40			
Cost of water	KL	144.00			
<b>c) Equipment</b>					
Vibratory roller	hour	12.00			
<b>OR</b>					

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><b>By Mechanical Means:</b>  <i>Unit = cum (For 360 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 15.00</p> <p><b>b) Material</b>                      Aggregate (Grading as per specification)</p> <p><b>Stone Screening</b>                      13.2 mm for grading-I cum 57.60</p> <p><b>OR</b>                      11.2 mm for grading-II cum 86.40                      Cost of water KL 144.00</p> <p><b>c) Equipment</b>                      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><b>Crusher Run Macadam Base and sub-base</b>  <b>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.</b>  <i>Unit = cum (For 360 cum)</i></p> <p><b>By Mix in Place Method</b></p> <p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 14.00</p> <p><b>c) Material</b>                      Aggregate at site</p> <p><b>i) For 53 mm maximum size</b>                      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><b>Or</b>  <b>ii) For 45 mm maximum size</b>                      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
12.8	Remarks 1205	22.4 mm to 5.6 mm	cum	237.60
		Below 5.6 mm	cum	213.48
		Cost of water	KL	36.00
		<b>b) Equipment</b>		
		Motor grader	hour	6.00
		Vibratory roller	hour	6.00
		Any one size / grading of the aggregate grading shall select.		
		<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
Unskilled	day	9.00		
<b>b) Material</b>				
Cost of water	KL	6.00		
<b>c) Equipment</b>				
Plate compactor	hour	9.00		
12.9	1205	<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	6.00
		<b>b) Material</b>		
		Soil/ borrowpit material	cum	27.00
		Cost of water	KL	6.00
		<b>c) Equipment</b>		
		Plate Compactor	hour	9.00



NORMS FOR RATE ANALYSIS

S No	Ref. to SS.	Description of Activity / Resource	Unit	Quantity
	<b>Remarks</b>	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><b>Construction of Shoulders</b></p> <p><b>A. Earthen Shoulders</b> The rate as applicable for sub-grade construction may be adopted.</p> <p><b>B. Hard Shoulders</b> Rate as applicable for sub-base and or base may be adopted as per approved design.</p> <p><b>C. Paved shoulders</b> The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.</p>		
12.11	1205	<p><b>Footpaths and Separators</b></p> <p><b>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.</b> <i>Unit = sqm (For 300 sqm)</i></p> <p><b>a) Labour</b></p> <p>Skilled day 8.00 Unskilled day 45.00</p> <p><b>b) Material</b></p> <p><b>i) For Granular sub base Material</b></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><b>ii) For cement concrete grade M 15, ( 7.5 cum)</b></p> <p>Aggregate 12 mm cum 6.75 Sand cum 3.38 Cement tonne 1.88</p> <p><b>iii) For cement plaster 1:3</b></p> <p>Sand cum 3.84 Cement tonne 1.83</p> <p><b>iv) Pre-cast cement concrete tiles</b> Tiles size 300 x 300 mm and 25 mm thick nos 3300.00</p> <p><b>v) pipes for drainage</b> 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
			<b>c) Equipment</b>		
			Vibratory road roller	hour	1.25
			Concrete mixer	hour	9.00
			<b>Telford base (block pitching)</b>		
			<b>Providing laying, spreading watering, levelling and compaction of Telford base ( Block pitching) as per Drawing and Technical Specifications.</b>		
			<i>Unit = cum (For 50 cum)</i>		
			<b>a) Labour</b>		
			Skill	day	60.00
			Unskilled	day	120.00
12.13	A	1207	<b>b) Material</b>		
			Block stone	cum	55.00
			dust	cum	16.00
			Cost of water	KL	12.00
			<b>c) Equipment</b>		
			Vibratory road roller	hour	6.00
			<b>Dry Bound Macadam</b>		
			<b>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.</b>		
			<b>By Manual Means</b>		
			<i>Unit = cum (For 180 cum)</i>		
(i)			<b>a) Labour</b>		
			Skilled	day	3.00
			Unskilled	day	180.00
			<b>b) Material</b>		
			<b>Grading-I Aggregate</b>		
			Grading-I 63 mm to 45 mm /Grading-II 53 mm to 22.4 mm	cum	217.80
			<b>Stone Screening</b>		
			Crushable type such as Moorum or Gravel for grading I &II	cum	105.59
			<b>Binding Material</b>		
			Binding Material	cum	14.40
Cost of water	KL	72.00			
(ii)			<b>Grading-II Aggregate</b>		

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
		<b>Stone Screening</b>		
		Crushable type such as Moorum or Gravel for grading I & II	cum	52.80
		<b>Binding Material</b>		
		Binding Material	cum	14.40
		Cost of water	KL	72.00
		<b>c) Equipment</b>		
		Vibratory roller or	hour	6.00
		Smooth 3 wheeled steel roller	hour	12.00
		<b>Wet Mix Macadam</b>		
		<b>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.</b>		
		<b>Base course with B1 material</b>		
		<i>Unit = cum [For 225 cum (495 tones)]</i>		
		<b>a) Labour</b>		
		Skilled	day	3.00
		Unskilled	day	10.00
		<b>b) Material</b>		
		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		
<b>c) Equipment</b>				
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>B</b>				
<b>Base course with B2 material</b>				
<i>Unit = cum [For 225 cum (495 tones)]</i>				
<b>a) Labour</b>				
Skilled	day	3.00		
Unskilled	day	10.00		
<b>b) Material</b>				
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
		<b>c) Equipment</b> 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
	<b>C</b>	<b>Sub Base course with S1 material</b> <i>Unit = cum [For 225 cum (495 tones)]</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 45 mm to 22.4 mm 22.4 mm to 2.36 mm 2.36 mm to 75 micron Cost of water <b>c) Equipment</b> Wet mix plant / other similar equipment Electric generator Paver finisher Vibratory roller or Smooth 3 wheeled steel roller	day day cum cum cum KL hour hour hour hour hour	3.00 15.00 89.10 118.80 89.10 18.00 9.00 6.00 6.00 6.00 12.00
	<b>D</b>	<b>Sub Base course with S2 material</b> <i>Unit = cum [For 225 cum (495 tones)]</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 45 mm to 22.4 mm 22.4 mm to 2.36 mm 2.36 mm to 75 micron Cost of water <b>c) Equipment</b> Wet mix plant / other similar equipment Electric generator Paver finisher Vibratory roller or Smooth 3 wheeled steel roller	day day cum cum cum KL hour hour hour hour hour	3.00 15.00 89.10 118.80 89.10 18.00 9.00 6.00 6.00 6.00 12.00
	<b>Remarks</b>	1. Though vibratory roller is required only for 3 hour but it should be at site for 6 hours 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..		

**SECTION - 1300 BITUMINOUS SURFACE AND BASE COURSE**

S No		Ref. to SS	Description	Unit	Quantity
13.1	A	1302 1302	<p><b>Prime Coat</b>  <b>Prime Coat, with MC 30 / 70 by Mechanical Means</b>  <b>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 .</b>  <i>Unit = lit (For 5000 lit)</i></p> <p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 50.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      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><b>Prime Coat, with MC 30 / 70 by Bitumen , by manual means</b>  <b>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 .</b>  <i>Unit = lit (For 1000 lit)</i></p> <p><b>a) Labour</b>                      Skilled day 3.00                      Unskilled day 100.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      Tractor                      Bitumen sprayer                      Boiler                      Generator</p>	hour hour hour hour	6.00 6.00 8.00 8.00
	<b>Remarks</b>		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		
	<b>C</b>	<b>1302</b>	<p><b>Prime Coat, with Emulsion by Mechanical Means</b></p> <p><b>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 .</b>  <i>Unit = lit (For 5000 lit)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Bitumen emulsion                      Cost of water</p> <p><b>c) Equipment</b>                      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
	<b>D</b>		<p><b>Prime Coat with emulsion, for manual works</b>  <b>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.</b>  <i>Unit = lit (For 1000 lit)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Bitumen emulsion                      Cost of water</p> <p><b>c) Equipment</b>                      Tractor trolley                      Emulsion sprayer</p>	day day tonne KL hour hour	3.00 80.00 1.10 10.00 6.00 6.00
<b>13.2</b>	<b>A</b>	<b>1302</b>	<p><b>Tack Coat</b></p> <p><b>Tack coat with Bitumen By Mechanical Means</b>  <b>Providing and applying tack coat with hot Bitumen at specified rate on the prepared non-bituminous surfaces including cleaning as per Technical Speciation .</b>  <i>Unit = lit. (For 5000 lit)</i></p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			<p>a) <b>Labour</b>                      Skilled                      Unskilled</p> <p>b) <b>Material</b>                      Bitumen (paving grade)</p> <p>c) <b>Equipment</b>                      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>B</b>		<p><b>Tack coat with Bitumen by Manual Means</b>  <b>Providing and applying tack coat with hot Bitumen at the specified rate the prepared surfaces including cleaning as per Technical Speciation .</b></p> <p><i>Unit = lit. (For 1000 lit)</i></p> <p>a) <b>Labour</b>                      Skilled                      Unskilled</p> <p>b) <b>Material</b>                      Bitumen (paving grade)</p> <p>c) <b>Equipment</b>                      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>
	<b>Remarks</b>		<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>		
	<b>C</b>	<b>1302</b>	<p><b>Tack coat with Emulsion By Mechanical Means</b>  <b>Providing and applying tack coat with Bitumen emulsion at specified rate on the prepared non-bituminous surfaces including cleaning as per Technical Speciation .</b></p> <p><i>Unit = lit (For 5000 lit)</i></p> <p>a) <b>Labour</b>                      Foreman                      Unskilled</p> <p>b) <b>Material</b>                      Bitumen emulsion</p> <p>c) <b>Equipment</b></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		
			<b>Tack coat with Emulsion By Manual Means</b>				
			<b>Providing and applying tack coat with Bitumen emulsion at the specified rate the prepared surfaces including cleaning as per Technical Speciation .</b>				
			<i>Unit = lit (For 1000 lit)</i>				
			<b>a) Labour</b>				
			Skilled			day	2.00
			Unskilled			day	20.00
			<b>b) Material</b>				
			Bitumen emulsion			tonne	1.10
			Cost of water			KL	1.00
			<b>c) Equipment</b>				
			Boiler			hour	6.00
			Hand sprayer			hour	6.00
			<b>Bituminous Macadam</b>				
			<b>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.</b>				
			<i>Unit = cum [For 102.5 cum (225 tonne)</i>				
			<b>a) Labour</b>				
			Skilled			day	7.00
			Unskilled			day	14.00
			<b>b) Material</b>				
			<b>i) Bitumen</b>			tonne	7.43
<b>*Grading I ( 40 mm nominal size )</b>							
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			
<b>or</b>							
<b>Grading II(19 mm nominal size)</b>							
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							
<b>c) Equipment</b>							
Batch mix HEMP			hour	6.00			





NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
13.5	1308	<b>b) Material</b>		
		Bitumen	tonne	22.70
		Coarse aggregate (63- 2.8 mm)	cum	405.00
		Key aggregates ( 26.5 - 2.8 mm)	cum	81.00
		<b>c) Equipment</b>		
		Chips Spreader ( with truck)	hour	6.00
		Bitumen distributor	hour	6.00
		Vibratory roller	hour	12.00
		<b>Dense Graded Bituminous Macadam</b>		
		<b>Providing and laying dense bituminous macadam using crushed aggregates of specified grading, premixed with bituminous binder and filler as per Drawing and Technical Specifications.</b>		
		<i>Unit = cum [For 97.5 cum (225 tonne)]</i>		
		<b>a) Labour</b>		
		Unskilled	day	16.00
		Skilled	day	5.00
		<b>b) Material</b>		
		<b>Bitumen</b>	tonne	9.56
		<b>Aggregate</b>		
		<b>Grading - I 40 mm (Nominal Size)</b>		
		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
<b>or</b>				
<b>Grading - II 19 mm (Nominal Size)</b>				
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				
<b>c) Equipment</b>				
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>		
		<b>Bituminous Concrete / Asphalt Concrete</b>		
		<b>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</b>		
		<i>Unit = cum [For 95.5 cum (225 tonne)]</i>		
		<b>a) Labour</b>		
		Unskilled	day	15.00
		Skilled	day	5.00
		<b>b) Material</b>		
		<b>i) Bitumen</b>	tonne	12.94
		<b>ii) Aggregate</b>		
		<b>* Grading - I-19 mm (Nominal Size)</b>		
		20 - 10 mm	cum	49.48
		10 - 5 mm	cum	32.52
5 mm and below	cum	56.55		
Filler	tonne	2.83		
<b>or</b>				
<b>Grading - II-13 mm (Nominal Size)</b>				
13.2 - 10 mm	cum	42.41		
10 - 5 mm	cum	35.34		
5 mm and below	cum	60.79		
Filler	tonne	2.83		
<b>*Any one of the alternative may be adopted as per approved design</b>				
<b>c) Equipment</b>				
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
	<b>Remarks</b>		<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>		
13.7		1303	<p><b>Surface Dressing</b>  <b>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.</b>  <b>MECHANICAL MEANS</b>  <i>Unit = sqm (For 6000 sqm)</i>  <b>:-19 mm nominal chipping size</b></p>		
	Case - I	A	<p><b>a) Labour</b>  Unskilled day 12.00  Skilled day 3.00</p> <p><b>b) Material</b>  Chips, 19 mm nominal size cum 102.00</p> <p><b>c) Equipment</b>  Chip spreader hour 6.00  Roller (pneumatic) hour 12.00</p>		
	Case - II		<p><b>13 mm nominal size chipping</b>  <i>Unit = sqm (For 7500 sqm)</i>  <b>a) Labour</b></p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			Unskilled	day	12.00
			Skilled	day	3.00
			<b>b) Material</b>		
			Crushed stone chipping, 13 mm nominal size	cum	87.00
			<b>c) Equipment</b>		
			Chip spreader	hour	6.00
			Roller (pneumatic)	hour	12.00
		<b>Case - III</b>	<b>10 mm nominal size chipping</b> <i>Unit = sqm (For 9000 sqm)</i>		
			<b>a) Labour</b>		
			Unskilled	day	12.00
			Skilled	day	3.00
			<b>b) Material</b>		
			Crushed stone chipping, 10 mm nominal size	cum	80.30
			<b>c) Equipment</b>		
			Chip spreader	hour	6.00
			Roller (pneumatic)	hour	12.00
		<b>Case - IV</b>	<b>6.0 mm nominal size chipping</b> <i>Unit = sqm (For 9000 sqm)</i>		
			<b>a) Labour</b>		
			Unskilled	day	12.00
			Skilled	day	3.00
			<b>b) Material</b>		
			Crushed stone chippings 6 mm nominal size	cum	48.20
			<b>c) Equipment</b>		
			chip spreader	hour	6.00
			Roller (pneumatic)	hour	12.00
		<b>Remarks</b>	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>B</b>	1303	<b>MANUAL MEANS</b> <i>Unit = sqm (For 600 sqm)</i> <b>:-19 mm nominal chipping size</b>		
			<b>a) Labour</b>		
			Unskilled	day	12.00
			Skilled	day	3.00
			<b>b) Material</b>		
			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	<b>c) Equipment</b> Roller (pneumatic) Add: 0.5 percent of Labour for T&P	hour	6.00	
		<b>13 mm nominal size chipping</b> <i>Unit = sqm (For 900 sqm)</i>			
		<b>a) Labour</b> Unskilled	day	12.00	
		Skilled	day	3.00	
		<b>b) Material</b> Crushed stone chipping, 13 mm nominal size	cum	10.40	
		<b>c) Equipment</b> Roller (pneumatic) Add: 0.5 per cent of (a) Labour for T&P	hour	2.25	
	Case - III	<b>10 mm nominal size chipping</b> <i>Unit = sqm ( For 1000 sqm)</i>			
		<b>a) Labour</b> Unskilled	day	12.00	
		Skilled	day	3.00	
		<b>b) Material</b> Crushed stone chipping, 10 mm nominal size	cum	8.90	
		<b>c) Equipment</b> 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 <b>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</b> <i>Unit = cum (For 30 cum)</i>	<b>a) Labour</b> Skilled	day	0.50	
Unskilled		day	24.00		
<b>b) Material</b> Bitumen		tonne	0.48		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
13.9	Remarks	1311	<b>c) Equipment</b> Bitumen boiler Mixture machine	hour hour	6.00 6.00
			<b>A</b> Above rate is for Pre-coating only ( excluding cost of Chips)  <b>20 mm thick Open-Graded Premix Carpet using Bituminous (Paving bitumen / Modified bitumen) Binder</b> 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 . By Manual Means <i>Unit = sqm [For 500 sqm (10 cum)]</i> <b>a) Labour</b> Unskilled Skilled <b>b) Material</b> Paving bitumen or other as per Design Crushed stone chipping, 13.2 mm to 5.6 mm <b>c) Equipment</b> Mixer Bitumen boiler oil fired Roller (Smooth wheeled)	day day tonne cum hour hour hour	21.00 8.00 0.73 13.50 4.00 4.00 2.00
	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		
			<b>B</b>  <b>By Mechanical Means</b> <b>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 .</b> <i>Unit = sqm [ For 4000 sqm (80 cum)</i> <b>(i) Mechanical method using Hot Mix Plant</b> <b>a) Labour</b> Unskilled Skilled <b>b) Material</b> Bitumen Crushed stone chipping, 13.2 mm to 5.6 mm <b>c) Equipment</b> Hot mixed plant	day day tonne cum hour	16.00 5.00 5.84 108.00 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
	<b>Remarks</b>		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)		<b>Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b> <i>Unit = sqm [For 900 sqm (24.3 cum)]</i>		
			<b>a) Labour</b>		
			Unskilled	day	18.00
			Skilled	day	3.00
			<b>b) Material</b>		
			Cationic Bitumen Emulsion	tonne	1.94
			Crushed stone aggregates 13.2 mm to 5.6 mm	cum	24.30
			<b>c) Equipment</b>		
			Concrete mixer	hour	6.00
			Smooth wheeled steel roller	hour	6.00
13.10		1310	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b> <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>		
			<b>a) Labour</b>		
			Unskilled	day	16.00
			Skilled	day	6.00
			<b>b) Material</b>		
			<b>Type - A</b>		
			* Bitumen	tonne	22.50
			Stone crushed aggregates 11.2 mm to 0.09	cum	276.75
			<b>or</b>		
			<b>Type - B</b>		
			Bitumen	tonne	19.48
			Stone crushed aggregates 13.2 mm to 0.09 mm	cum	276.75
			<b>c) Equipment</b>		
			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	Remarks	1310	<b>Seal Surfacing</b> <b>Providing and laying seal coat sealing the voids in a bituminous surface as per Drawing and Technical Specifications.</b> <i>Unit = sqm [For 7858 sqm (47.16 cum)]</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Bitumen Crushed stone chipping <b>c) Equipment</b> HMP Generator Paver finisher Roller	day day tonne cum hour hour hour hour	1.00 6.00 5.34 47.16 3.00 3.00 6.00 6.00
13.12	(i)	1310	<b>Slurry Seal</b> <b>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.</b>  <b>5 mm thickness</b> <i>Unit = sqm [For 16000 sqm (80 cum) density of 2.2 tonne per cum, weight of mix = 176 tonne]</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Binder Fine aggregate 4.75 mm Filler Cost of water <b>c) Equipment</b>	day day tonne cum tonne KL	1.00 8.00 19.36 102.08 3.52 12.00

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	
		<b>3 mm thickness</b>			
		<i>Unit = sqm [For 20000 sqm (60 cum)]</i>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	7.00	
		<b>b) Material</b>			
		Binder	tonne	17.16	
		Fine aggregate 3 mm and below	cum	74.80	
		Filler	tonne	2.64	
		Cost of water	KL	12.00	
	<b>c) Equipment</b>				
	Mechanical broom	hour	6.00		
	Air compressor	hour	6.00		
	Mobile slurry seal equipment	hour	6.00		
	(iii)	<b>1.5 mm thickness</b>			
		<i>Unit = sqm [For 24000 sqm (36 cum)]</i>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	7.00	
		<b>b) Material</b>			
		Binder	tonne	12.67	
		Fine aggregate 2.36 mm	cum	43.30	
Filler		tonne	1.58		
Cost of water		KL	12.00		
<b>c) Equipment</b>					
Mechanical broom		hour	6.00		
Air compressor	hour	6.00			
Mobile slurry seal equipment	hour	6.00			
	<b>Remarks</b>	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately			
	<b>1310</b>	<b>Fog Spray</b> <b>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.</b> <i>Unit = sqm (For 10500 sqm)</i> <b>a) Labour</b>			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
13.14		1313	Skilled	day	1.00
			Unskilled	day	4.00
			<b>b) Material</b>		
			Bitumen emulsion	tonne	7.88
			<b>c) Equipment</b>		
			Mechanical broom	hour	6.00
			Air compressor	hour	6.00
			Bitumen emulsion pressure distributor	tonne	6.00
			<b>Remarks</b>		In case it is decided by the engineer to blind the fog spray, the following may be added
			<b>a) Labour</b>		
			Skilled	day	1.00
			Unskilled	day	6.00
			<b>b) Material</b>		
			Crushed stone grit 3 mm	cum	26.25
			Bitumen emulsion	tonne	0.79
			<b>Bituminous Cold Mix ( Including Gravel Emulsion)</b>		
			<b>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.</b>		
			<i>Unit = cum [For 205 cum (450 tonne)]</i>		
			<b>(i) Using bitumen emulsion and 9.5 mm or 13.2 mm size aggregate</b>		
			<b>a) Labour</b>		
			Unskilled	day	16.00
			Skilled	day	6.00
			<b>b) Material</b>		
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			
<b>c) Equipment</b>					
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			
<b>(ii) Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate</b>					
<b>a) Labour</b>					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description	Unit	Quantity
			Unskilled	day	16.00
			Skilled	day	6.00
			<b>b) Material</b>		
			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
			<b>c) Equipment</b>		
			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)		<b>Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate</b>		
			<b>a) Labour</b>		
			Unskilled	day	16.00
			Skilled	day	6.00
			<b>b) Material</b>		
			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
			<b>c) Equipment</b>		
			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)		<b>Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate</b>		
			<b>a) Labour</b>		
			Unskilled	day	16.00
			Skilled	day	6.00
			<b>b) Material</b>		
			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
			<b>c) Equipment</b>		
			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	
		<b>Remarks</b>			
		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.			
		<b>Sand Asphalt Base Course</b>			
		<b>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.</b>			
		<i>Unit = cum[ for 205 cum ( 450 tonne)]</i>			
		<b>a) Labour</b>			
		Unskilled	day	16.00	
		Skilled	day	6.00	
		<b>b) Material</b>			
		Bitumen	tonne	22.50	
		Filler (lime)	tonne	9.00	
		Sand of size 4.75 to 0.075 mm	cum	288.62	
		<b>c) Equipment</b>			
		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	
		<b>Remarks</b>			
		1. Tack coat will be measured and paid separately as specified in item no 13.2			
13.16	1300	<b>Anti- Stripping agent</b>			
		<b>Providing and mixing of Anti stripping agent as per Design/ direction of Engineer</b>			

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description	Unit	Quantity
13.17	1300	<i>Unit = Kg (For 200 kg)</i>		
		<b>a) Labour</b>		
		Skilled	day	0.01
		Unskilled	day	1.00
13.18	1300	<b>b) Material</b>		
		Additive material	kg	210.00
		<b>c) Equipment</b>		
		Add 3 percent of Labour component for T&P		
13.19	1315	<b>Bitumen Cutter</b>		
		<b>Providing and mixing of Bitumen cutter as per design / direction of Engineer</b>		
		<i>Unit = lit. (For 200 lit)</i>		
		<b>a) Labour</b>		
13.18	1300	Skilled	day	0.01
		Unskilled	day	1.00
		<b>b) Material</b>		
		Kerosene/ Diesel cutter	Lit	210.00
13.19	1315	<b>c) Equipment</b>		
		Add 3 percent of Labour component for T&P		
		<b>Modified Binder</b>		
		<b>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.</b>		
13.19	1315	<i>Unit = tonne</i>		
		<b>a) Material</b>		
		Modified binder	tonne	1.00
		<b>Otta seal</b>		
13.19	1315	<b>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.</b>		
		<i>Unit = sqm [ For 4200 sqm]</i>		
		<b>a) Labour</b>		
		Unskilled	day	18.00
13.19	1315	Skilled	day	2.00
		<b>b) Material</b>		
		Bitumen	tonne	6.43
		Crushed stone chipping, 0-16 mm size	cum	67.20
13.19	1315	<b>c) Equipment</b>		
		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	
			<b>Remarks:</b>			
			(ii)	<b>Coarse sand seal</b> As specified in Item no 13.11.		
			(i)	<b>Recipe Cold Mix</b> <b>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.</b> <i>Unit = cum [For 205 cum (450 tonne)]</i> <b>75 mm thickness</b>		
				<b>a) Labour</b>		
				Unskilled	day	12.00
				Skilled	day	6.00
				<b>b) Material</b>		
				Bitumen emulsion	tonne	20.25
				Crushed stone aggregates 40 mm nominal size	cum	297.00
				Cost of water	KL	6.00
				<b>c) Equipment</b>		
				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)	<b>40 mm thickness</b>					
	<b>a) Labour</b>					
	Unskilled	day	12.00			
	Skilled	day	6.00			
	<b>b) Material</b>					
	Bitumen emulsion	tonne	31.50			
	Crushed stone aggregates 14 mm nominal size	cum	287.00			
	Cost of water	KL	6.00			
	<b>c) Equipment</b>					
	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
			<b>25 mm thickness</b>		
			<b>a) Labour</b>		
			Unskilled	day	12.00
			Skilled	day	6.00
			<b>b) Material</b>		
			Bitumen emulsion	tonne	38.25
			Crushed stone aggregates 6 mm nominal size	cum	270.00
			Cost of water	KL	6.00
			<b>c) Equipment</b>		
			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
	<b>Remark</b>		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	<b>Mastic Asphalt</b> <b>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.</b> <i>Unit = sqm [For 140 sqm (8 tonne)(3.48 cum) assuming a density of 2.3 tonne/cum.]</i>		
			<b>a) Labour</b>		
			Unskilled	day	40.00
			Skilled	day	4.00
			<b>b) Material</b>		
			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		
			<b>i) Bitumen @ 10.2 % by weight of mix</b>	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
		<b>c) Equipment</b>		
		Mechanical broom	hour	1.00
		Air compressor	hour	1.00
		Mastic cooker	hour	6.00
		Bitumen boiler	hour	6.00
		Tractor	hour	1.00
	<b>Remarks</b>	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><b>Precast Cement Concrete M 20 Kerb</b>  <b>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.</b>  <i>Unit = meter (For 400 meter)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      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
	<b>Remarks</b>		Foundation concrete or sand gravel to be measured and paid separately as required from respective clause of specification.		
14.2	A	1401	<p><b>Cast in Situ Cement Concrete or natural stone block for footpath</b>  <b>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.</b>  <i>Unit = Sqm (For 10 Sqm)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      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
	<b>Remarks</b>		Foundation concrete or sand gravel to be measured and paid separately as required from respective clause of specification.		
	B		<p><b>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.</b>  <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	<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	3.00
		<b>b) Material</b>		
		50 mm thick natural stone slab	sqm	11.00
		sand	cum	0.13
		Cement	tonne	0.07
		Cost of water	KL	0.02
		<b>Cast in Situ Cement Concrete Kerb</b>		
		<b>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.</b>		
		<i>Unit = meter [For 360 meter ( 24.21 cum concrete, = 12.6 cum, M 10= 11.61 cum)]</i>		
		<b>a) Labour</b>		
		Skilled	day	6.00
		Unskilled	day	60.00
<b>b) Material</b>				
Crushed stone aggregate 20 mm	cum	21.80		
Coarse sand	cum	10.90		
Cement	tonne	7.53		
Cost of water	KL	30.00		
<b>c) Equipment</b>				
Kerb casting machine	hour	8.00		
Concrete mixer	hour	8.00		
14.4	1401	<b>Cast in Situ Cement Concrete M 20 Kerb with Channel</b>		
		<b>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.</b>		
		<i>Unit = meter [For 300 meter length (= 17.48, =23.18 cum)]</i>		
		<b>a) Labour</b>		
		Skilled	day	6.00
		Unskilled	day	70.00
		<b>b) Material</b>		
		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
			<b>c) Equipment</b>		
			Kerb casting machine	hour	18.00
			Concrete mixer	hour	18.00
			Water tanker	hour	18.00
			<b>Brick work for footpath</b>		
	<b>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.</b>				
	<i>Unit = sqm (For 10 sqm)</i>				
	<b>a) Labour</b>				
	Skilled	day	1.00		
	Unskilled	day	3.00		
	<b>b) Material</b>				
	Brick	nos	725.00		
Coarse sand	cum	0.70			
B			<b>Providing and laying flat brick over 60 mm thick sand bed in footpath including excavation sand bedding all complete as per specification.</b>		
			<i>Unit = sqm (For 20 sqm)</i>		
			<b>a) Labour</b>		
			Skilled	day	1.50
			Unskilled	day	4.00
			<b>b) Material</b>		
			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><b>TRAFFIC SIGN</b></p> <p><b>Non Reflective Traffic Signs</b></p> <p><b>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.</b></p> <p><b>Unit = no. (For 4 traffic sign)</b></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><b>(a) Labour (For fixing at site)</b></p> <p>Skilled</p> <p>Unskilled</p> <p><b>b) Material</b></p> <p><b>Support of traffic sign</b></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><b>(c) Equipment</b></p> <p>Tractor with trolley</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.		
		<b>Retro-Reflectorized Traffic Signs</b>		
		<b>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.</b>		
		<i>Unit = no. (For 10 traffic sign)</i>		
		<b>i) Excavation for foundation</b>	cum	0.54
		<b>ii) Cement concrete M 10 grade</b>	cum	0.27
		<b>iii) Painting angle iron post two coats</b>	sqm	8.78
		<b>a) Labour (For fixing at site)</b>		
		Skilled	day	1.00
		Unskilled	day	3.00
		<b>b) Material</b>		
		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		
<b>c) Equipment</b>				
Tractor-trolley	hour	3.00		
<b>Remarks</b>		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
15.4	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><b>Painting Two Coats on Concrete Surfaces</b>  <b>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.</b>  <i>Unit = sqm (For 10 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled /Painter                      Unskilled</p> <p>b) <b>Material</b>                      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><b>Painting on Steel Surfaces</b>  <b>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.</b>  <i>Unit = sqm (For 20 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled/ Painter                      Unskilled</p> <p>b) <b>Material</b>                      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><b>Painting on Wood Surfaces</b>  <b>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.</b>  <i>Unit = sqm (for 15 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled / Painter                      Unskilled</p> <p>b) <b>Material</b>                      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.		
		<b>Painting Lines, Dashes, Arrows etc. on Roads in Two Coats</b>		
		<b>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.</b>		
		<b>Over 10 cm in width</b>		
		<i>Unit = sqm (For 10 sqm)</i>		
		<b>a) Labour</b>		
		Skilled/ Painter	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
		Road marking Paint as per NS 408/ IS :164	liter	1.48
(i)	(ii)	<b>Up to 10 cm in width</b>		
		<i>Unit = sqm (For 10 sqm)</i>		
		<b>a) Labour</b>		
		Skilled / Painter	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
Road marking paint	liter	1.48		
15.8	1503	<b>Painting Lines, Dashes, Arrows etc. on Roads in Two Coats on Old Work</b>		
		<b>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.</b>		
		<b>Over 10 cm in width</b>		
		<i>Unit = sqm(For 10 sqm)</i>		
		<b>a) Labour</b>		
		Skilled / Painter	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
Road marking paint	liter	0.90		
(i)	(ii)	<b>Up to 10 cm in width</b>		
		<i>Unit = sqm(For 101 sqm)</i>		
		<b>a) Labour</b>		
		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>b) Material</b>		
		Road marking Paint	liter	0.90
		<b>i</b>		
		<b>Road Marking with Hot Applied Thermoplastic Compound with Reflectorizing Glass Beads on Bituminous Surface</b>		
		<b>On smooth surface (similar to Asphalt concrete and rigid pavement)</b>		
		<b>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.</b>		
		<b>Unit = sqm (For 400 sqm)</b>		
		<b>a) Labour</b>		
		Skilled / Painter	day	2.00
		Unskilled	day	4.00
		<b>b) Equipment</b>		
		Road marking machine ( boiler + Applicator + Template)	hour	10.00
		Tractor-trolley	hour	10.00
<b>c) Material</b>				
Hot applied thermoplastic compound	liter	930.00		
Reflectorizing glass beads	kg	100.00		
<b>Remarks</b>		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.		
		<b>ii</b>		
		<b>On rough surface ( similar to surface dressing)</b>		
		<b>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.</b>		
		<b>Unit = sqm (For 300 sqm)</b>		
		<b>a) Labour</b>		
		Skilled / Painter	day	2.00
		Unskilled	day	4.00
		<b>b) Equipment</b>		
		Road marking machine ( boiler + Applicator + Template)	hour	10.00
		Tractor-trolley	hour	10.00
		<b>c) Material</b>		
		Hot applied thermoplastic compound	liter	1200.00
		Reflectorizing glass beads	kg	150.00
<b>Remarks</b>		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)		
			<b>a) Labour</b>		
			Skilled	day	1.00
			Unskilled	day	2.00
			<b>b) Material</b>		
			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			<b>Solar power studs</b> Add 10 per cent of cost of Material for fixing and installation		
iii			<b>Cats eye</b> Add 10 per cent of cost of Material for fixing and installation		
15.11	(i)	1506	<b>Kilometer Stone</b>		
			Providing and Fixing Reinforced cement concrete M 15 grade kilometer Post including painting and printing as per Standard Drawing-2070 and Technical Specifications. position		
			<b>Five kilometer Post (precast)</b> <i>Unit = no. (For 6 Nos.)</i>		
			<b>a) i. M-15 grade of concrete</b>	cum	1.20
			<b>a) ii M-10 grade of concrete</b>	cum	1.20
			<b>b) Steel reinforcement</b>	kg	63.60
			<b>c) Excavation in soil for foundation</b>	cum	1.20
			<b>d) Painting two coats on concrete surface</b>	sqm	10.20
			<b>e) Lettering on km post</b>	cm-letter	1800.00
			<b>Transportation and fixing at site</b>		
<b>f) Labour</b>					

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled	day	1.00
		Unskilled	day	6.00
		<b>g) Equipment</b>		
		Tractor-trolley	hour	3.00
	<b>Remarks</b>	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.		
	<b>(ii)</b>	<b>One kilometer post (precast)</b>		
		<i>Unit = no.(For 14 Nos.)</i>		
		<b>a) i. M-15 grade of concrete</b>	cum	1.40
		<b>a) ii M-10 grade of concrete</b>	cum	2.38
		<b>b) Steel reinforcement as per standard drawing</b>	kg	82.88
		<b>c) Excavation in soil for foundation</b>	cum	2.38
		<b>d) Painting two coats on concrete surface</b>	sqm	11.90
		<b>e) Lettering on km post</b>	cm - letter	1680.00
		<b>Transportation and fixing at site</b>		
		<b>f) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	7.00
		<b>g) Equipment</b>		
		Tractor-trolley	hour	3.00
	<b>Remarks</b>	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.		
<b>15.12</b>	<b>1507</b>	<b>Road Delineators Post</b>		
		<b>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.</b>		
		<i>Unit = no. (For 30 Nos.)</i>		
		<b>a) M-15 grade of concrete</b>	cum	1.01
		<b>b) Steel reinforcement as per standard drawing ( 4 Nos 8 mm dia and 11 Nos 6 mm dia stirrups)</b>	kg	112.80
		<b>c) Excavation in soil for foundation</b>	cum	0.47
		<b>d) Painting two coats on concrete surface</b>	sqm	14.40
		<b>Transportation and fixing</b>		
		<b>e) Labour</b>		
		Skilled (Mason)	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Unskilled	day	7.00
		<b>f) Equipment</b>		
		Tractor-trolley	hour	3.00
		1. The rate for excavation, cement concrete , reinforcement., painting and lettering may be taken from respective Chapters.		
	<b>Remarks</b>	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	<b>Reinforced Cement Concrete Crash Barrier</b> <b>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.</b>  <i>Unit = meter (For 10 m)</i> Taking output = 10 m		
	(i)	<b>a) M 20 grade concrete</b> <b>M 20 grade concrete</b>	cum	3.00
		<b>b) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	2.00
		<b>c) Material</b>		
		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	<b>Metal Beam Crash Barrier</b>		
	A	<b>Type - A, "W" : Metal Beam Crash Barrier</b> <b>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.</b> <i>Unit = meter (For 40 m. length)</i>		
		<b>a) Labour</b>		
		Skilled (Blacksmith)	day	1.00
		Unskilled	day	10.00
		<b>b) Material</b>		
		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 <b>M 20 grade concrete</b> E/W excavation for post Add 25 per cent of the cost of Material for fabrication, nuts, bolts and washers etc.) <b>c) Equipment</b> Tractor-trolley	kg kg cum cum  hour	695.52 127.51 0.99 0.99  3.00
	<b>Remarks</b>	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>B Type - B, "THRIE" : Metal Beam Crash Barrier</b> <b>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.</b> <i>Unit = meter (For 40 m. length)</i> <b>a) Labour</b> Skilled(Blacksmith) Unskilled <b>b) Material</b> 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 , <b>M 20 grade concrete</b> E/W excavation for post Add 25 per cent of the cost of Material for fabrication, nuts, bolts and washers etc.) <b>c) Equipment</b> 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
	<b>Remarks</b>	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.		
	<b>C</b>	<b>Flexible Crash Barrier, Wire Rope Safety Barrier</b>		

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><b>a) Labour</b> Unskilled day 4.00 Skilled (Blacksmith) day 2.00</p> <p><b>b) Material</b> 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><b>M 20 grade concrete</b> 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><b>c) Painting</b> Applying 2 coats of painting on exposed surface sqm 16.50</p> <p><b>d) Equipment</b> 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>		
15.15	A	2800/1500		
	B			
		<p><b>Anti-Glare Devices in Median</b></p> <p><b>Plantation</b> 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</p> <p><b>Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vans</b></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><b>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.</b></p> <p><i>Unit = meter (For 10 m.)</i></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 2.00</p> <p><b>b) Material</b>                      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><b>c) Painting</b>                      Applying 2 coats of painting on exposed surface sqm 18.30</p>		
	<b>Remarks</b>	<p>The items of excavation and cement concrete as per approved design to be measured and paid separately</p> <p><b>Anti-glare screen with rectangular vane of MS sheet</b></p> <p><b>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.</b></p> <p><i>Unit = meter (For 15 m.)</i></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 2.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      Tractor-trolley hour 3.00</p> <p><b>d) Painting</b>                      Applying 2 coats of painting sqm 8.50</p>		
	<b>C</b>			



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><b>Street Lighting</b>                      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><b>a) Labour</b>                      Unskilled day 1.00                      Skilled (Electrician) day 1.00</p> <p><b>b) Material</b>                      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><b>c) Painting</b>  <b>For Fixing in Median</b>                      Providing two coats of aluminum paint over steel circular hollow pipe with overhang on both sides sqm 5.75  <b>For fixing in Footpath</b>                      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><b>Rumble Strips</b>  <b>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.</b>                      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 &amp; 15 respectively for the quantities calculated from approved drawings</p>		
15.18	1506	<p><b>Lettering new Letter and Figures of any Shade</b></p>		



**SECTION 1600 - PILING FOR STRUCTURES**

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
16.1	A	1612	<b>PILE FOUNDATION</b>			
			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.			
			<b>Pile diameter-500 mm</b> <i>Unit = meter (For 5 m depth.)</i>			
			<b>a) Labour</b>			
	Skilled	day	1.00			
	Unskilled	day	7.00			
	<b>b) Materials</b>					
	Bentonite	kg	75.00			
	<b>c) Equipment ( for boring and construction )</b>					
	piling rig ( with all accessories)	hour	2.50			
	Crane	hour	2.50			
	Bentonite pump	hour	2.50			
	B	1612	1612	<b>Pile diameter-600 mm</b> <i>Unit = meter (For 5 m depth.)</i>		
				<b>a) Labour</b>		
				Skilled	day	1.00
				Unskilled	day	10.00
<b>b) Materials</b>						
Bentonite	kg	100.00				
<b>c) Equipment( for boring and construction )</b>						
piling rig ( with all accessories)	hour	3.00				
Crane	hour	3.00				
Bentonite pump	hour	3.00				
C	1612	1612	<b>Pile diameter-750 mm</b> <i>Unit = meter (For 5 m depth.)</i>			
			<b>a) Labour</b>			
			Skilled	day	2.00	
			Unskilled	day	15.00	
<b>b) Materials</b>						
Bentonite	kg	150.00				
<b>c) Equipment( for boring and construction )</b>						
Piling rig ( with all accessories)	hour	4.50				
Crane	hour	4.50				
Bentonite pump	hour	4.50				
D	1612	1612	<b>Pile diameter-1000 mm</b> <i>Unit = meter (For 5 m depth.)</i>			
			<b>a) Labour</b>			
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>b) Materials</b>		
		Bentonite	kg	220.00
		<b>c) Equipment( for boring and construction )</b>		
		piling rig ( with all accessories)	hour	6.00
		Crane	hour	6.00
		Bentonite pump	hour	6.00
		<b>Pile diameter-1200 mm</b>		
		<i>Unit = meter (For 5 m depth.)</i>		
		<b>a) Labour</b>		
		Skilled	day	3.00
		Unskilled	day	25.00
		<b>b) Materials</b>		
		Bentonite	kg	320.00
<b>c) Equipment( for boring and construction )</b>				
piling rig ( with all accessories)	hour	7.50		
Crane	hour	7.50		
Bentonite pump	hour	7.50		
	<b>Remarks:</b>	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.		
		<b>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 .</b>		
		<b>Pile diameter-300 mm</b>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<i>Unit = meter (For 5 m depth.)</i>		
		<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	15.00
		<b>b) Materials</b>		
		Bentonite	kg	25.00
		<b>c) Equipment ( for boring and construction )</b>		
		piling rig ( with all accessories)	hour	3.00
		Crane	hour	3.00
		Bentonite pump	hour	3.00
<b>B</b>		<b>Pile diameter-500 mm</b>		
		<i>Unit = meter (For 5 m depth.)</i>		
		<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	20.00
		<b>b) Materials</b>		
		Bentonite	kg	50.00
		<b>c) Equipment ( for boring and construction )</b>		
		Piling rig ( with all accessories)	hour	4.00
		Crane	hour	4.00
		Bentonite pump	hour	4.00
<b>C</b>		<b>Pile diameter-600 mm</b>		
		<i>Unit = meter (For 5 m depth.)</i>		
		<b>a) Labour</b>		
		Skilled	day	3.00
		Unskilled	day	30.00
		<b>b) Materials</b>		
		Bentonite	kg	100.00
		<b>c) Equipment( for boring and construction )</b>		
		Piling rig ( with all accessories)	hour	5.00
		Crane	hour	5.00
		Bentonite pump	hour	5.00
<b>D</b>		<b>Pile diameter-750 mm</b>		
		<i>Unit = meter (For 5 m depth.)</i>		
		<b>a) Labour</b>		
		Skilled	day	3.00
		Unskilled	day	30.00
		<b>b) Materials</b>		
		Bentonite	kg	50.00
		<b>c) Equipment( for boring and construction )</b>		
		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
		<b>Pile diameter-1000 mm</b> <i>Unit = meter (For 5 m depth.)</i>		
		<b>a) Labour</b>		
		Skilled	day	5.00
		Unskilled	day	50.00
		<b>b) Materials</b>		
		Bentonite	kg	75.00
		<b>c) Equipment( for boring and construction )</b>		
		Piling rig ( with all accessories)	hour	9.00
		Crane	hour	9.00
Bentonite pump	hour	9.00		
	<b>Remarks:</b>	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.		
		<b>Providing, driving and installing precast RCC. pile of specified size and quality complete as per drawing and &amp; Technical Specification</b> <b>Pile diameter -300 mm</b> <i>Unit = Running meter (For 25 m.)</i>		
		<b>a) Labour</b>		
		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>b) Materials</b>		
		RCC Grade M 35 or other as per Design	cum	1.94
		Reinforcement (as per design or 2.5 % of concrete)	kg	378.86
		<b>Materials Pile shoes</b>		
		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)		
		<b>c) Equipment</b>		
		Piling rig (with all accessories)	hour	6.00
		Crane	hour	3.00
		<b>Pile diameter -500 mm</b>		
		<i>Unit = Running meter (For 20 m.)</i>		
		C		<b>a) Labour</b>
Skilled	day			1.00
Unskilled	day			5.00
<b>b) Materials</b>				
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
<b>Materials Pile shoes</b>				
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)				
<b>c) Equipment</b>				
Piling rig (with all accessories)	hour			6.00
Crane	hour	3.00		
<b>Pile diameter - 600 mm</b>				
<i>Unit = Running meter (For 10 m.)</i>				
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	5.00
		<b>b) Materials</b>		
		RCC Grade M 35 or other as per Design	cum	3.11
		Reinforcement (as per design or 2.5 % of concrete)	kg	606.18
		<b>Materials Pile shoes</b>		
		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





**SECTION 1700 - WELL FOUNDATIONS**

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
17.1	A	1700	<p><b>Providing and Constructing of temporary Island for well sinking as per Drawing and instruction of the Engineer.</b>  <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><b>a) Labour</b>                      Skilled day 0.40                      Unskilled day 22.00</p> <p><b>b) Material</b>                      Earth (compacted) cum 251.20                      Sand bags Nos 750.00</p> <p><b>c) Equipment</b>                      Crane hour 20.00                      Consumables @ 2.5 per cent of equipment cost</p>		
			<p><b>Remarks:</b> 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><b>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.</b>  <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><b>a) Labour</b>                      Skilled day 0.36                      Unskilled day 9.00</p> <p><b>b) Material</b>                      Earth cum 450.00                      Sand bags Nos 300.00</p> <p><b>c) Equipment</b>                      Loader hour 24.00                      Tipper hour 24.00</p>		
17.2		1700	<p><b>Providing and Laying Cutting Edge of Mild Steel for Well</b>  <i>Unit = tonne (For 1 tonne)</i></p> <p><b>a) Labour</b>  <b>(for cutting, bending, making holes, joining, welding and erecting in position)</b>                      Skilled (Fitter + Black smith + Welder) day 21.00                      Unskilled day 21.00</p> <p><b>b) Material</b>                      Structural steel tonne 1.05                      Nuts &amp; 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	<b>Providing and laying Plain/Reinforced Cement Concrete excluding reinforcement in Well Foundation all complete as per Drawing and Technical Specifications.</b> <i>Unit = cum (For 1 cum)</i>			
	A	1703	<b>Well curb</b>			
	(i)		<b>RCC M 20 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 C.</b> <b>d) formwork @ 20 per cent of the cost of concrete</b>			
	(ii)		<b>RCC M 25 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 E.</b> <b>d) formwork @ 20 per cent of the cost of concrete</b>			
	(iii)		<b>RCC M 30 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 G.</b> <b>d) formwork @ 20 per cent of the cost of concrete</b>			
	<b>Remarks:</b>		If curb concrete is carried out within steel liner, cost of formwork shall be excluded.			
	B		1704	<b>Well Steining</b>		
	(i)			<b>PCC M 20 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 B.</b> <b>d) formwork @ 10 per cent of the cost of concrete</b>		
	(ii)			<b>RCC M 20 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 C.</b> <b>d) formwork @ 10 per cent of the cost of concrete</b>		
	(iii)			<b>RCC M 25 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 E.</b> <b>d) formwork @ 10 per cent of the cost of concrete</b>		
	(iv)	<b>RCC M 30 Grade</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item no 20.2 G.</b> <b>d) formwork @ 10 per cent of the cost of concrete</b>				
	C	1706		<b>Bottom Plug</b> 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 <b>PCC Grade M 20</b> <i>Unit = cum (For 15 cum)</i> <b>a) Labour</b> Skilled (Mason ) Unskilled <b>b) Material</b> Cement Coarse sand 40 mm Aggregate 20 mm Aggregate 10 mm Aggregate Admixture <b>c) Equipment</b> Concrete mixer Generator Crane  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..	day day tonne cum cum cum cum Kg hour hour hour	3.00 20.00 5.55 6.75 5.40 5.40 2.70 18.60 6.00 6.00 6.00
	(ii)	<b>PCC Grade M 25</b> <i>Unit = cum (For 15 cum)</i> <b>a) Labour</b> Skilled (Mason ) Unskilled <b>b) Material</b> Cement Coarse sand 40 mm Aggregate 20 mm Aggregate 10 mm Aggregate Admixture <b>c) Equipment</b> Concrete mixer Generator Crane  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..	day day tonne cum cum cum cum Kg hour hour hour	3.00 20.00 5.99 6.75 5.40 5.40 2.70 21.60 6.00 6.00 6.00
D	(i)	<b>Intermediate plug</b> <b>Grade M 20 PCC</b> 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)	<b>Grade M 25 PCC</b> Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc. (i.e.. 3 % of Labour cost)		
	E (i)	<b>Top plug</b> <b>Grade M 15 PCC</b> Same as Item PCC in open foundation excluding formwork		
	F (i)	<b>Well cap</b> <b>RCC Grade M 20</b> <i>Unit = cum (For 15 cum)</i> <b>a) Labour</b> Skilled (Mason) Unskilled <b>b) Material</b> Cement Coarse sand 20 mm Aggregate 10 mm Aggregate <b>c) Equipment</b> Concrete mixer Generator <b>d) Form Work @ 4 per cent of ( a+b+c)</b>	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)	<b>RCC Grade M 25</b> <i>Unit = cum (For 15 cum)</i> <b>a) Labour</b> Skilled (Mason ) Unskilled <b>b) Material</b> Cement Coarse sand 20 mm Aggregate 10 mm Aggregate <b>c) Equipment</b> Concrete mixer Generator <b>d) Form Work @ 3.75 per cent of ( a+b+c)</b>	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)	<b>RCC Grade M 30</b> <i>Unit = cum (For 15 cum)</i> <b>b) Labour</b> 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)	<b>a) Material</b> Cement Coarse sand 20 mm Aggregate 10 mm Aggregate <b>c) Equipment</b> Concrete mixer Generator <b>d) Form Work @ 3. 50 per cent of ( a+b+c)</b>	tonne cum cum cum hour hour	6.10 6.75 8.10 5.40 6.00 6.00		
		<b>RCC Grade M 35</b> <i>Unit = cum (For 15 cum)</i> <b>a) Labour</b> Skilled (Mason) Unskilled <b>b) Material</b> Cement Coarse sand 20 mm Aggregate 10 mm Aggregate <b>c) Equipment</b> Concrete mixer Generator <b>d) Form Work @ 3. 0 per cent of ( a+b+c)</b>	day day tonne cum cum cum hour hour	3.00 20.00 6.33 6.75 8.10 5.40 6.00 6.00		
		<b>1705 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.</b>  <i>Unit = meter. (For 1 m.)</i> <b>Diameter of well - 6 m.</b> <b>Sandy Soil</b> <b>Depth below bed level upto 3.0 M</b> <b>a) Labour</b> Skilled (Sinker ) semi-skilled (Sinking helper) <b>b) Equipment</b> crane with grab bucket Consumables in sinking @10 per cent of (b)	day day hour	1.50 2.00 6.00		
		<b>(ii) Beyond 3 m upto 10 m depth</b> <b>a) Labour</b> Skilled (Sinker) semi-skilled (Sinking helper) <b>b) Equipment</b> crane with grab bucket	day day hour	2.00 3.00 6.00		
		A				
		(i)				

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		<b>Beyond 10 m upto 20 m</b> Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
(iv) a		<b>Beyond 20 m upto 30 m</b> 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		<b>Clayey Soil ( 6 m dia. Well )</b> <i>Unit = meter. (For 1 m.)</i>		
(i)		<b>Depth below bed level upto 3.0 m</b>		
		<b>a) Labour</b>		
		Skilled (Sinker )	day	2.00
		Semi-skilled (Sinking helper)	day	3.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(ii)		<b>Beyond 3 m upto 10 m depth</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper )	day	5.00
		<b>b) Equipment</b>		
		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		<b>Beyond 10 m upto 20 m</b> 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		<b>Beyond 20 m upto 30 m</b> 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		<b>Soft Rock (6 m dia well )</b> <i>Unit = meter. (For 1 m.)</i>		
		<b>a) Labour</b>		
		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>b) Equipment</b>		
		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		
		<b>Hard Rock (6 m dia well )</b>		
		<i>Unit = meter ( For 1 m)</i>		
		<b>a) Labour</b>		
	Driller	day	4.00	
	Blaster	day	1.00	
	Unskilled	day	12.00	
	Skilled	day	5.00	
	<b>b) Material</b>			
	Gelatin 80 per cent	Kg	4.00	
	Electric Detonators	nos	18.00	
	<b>c) Equipment</b>			
	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).				
<b>Remarks:</b>		<b>Depth of sinking is reckoned from bed level.</b>		
		<b>Add cost related to security personnel for handling of explosive</b>		
		<b>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.</b>		
		<i>Unit = meter (For 1 m.)</i>		
		<b>Diameter of well - 7 m.</b>		
		<b>Sandy Soil</b>		
		<b>Depth below bed level upto 3.0 M</b>		
A	1705	<b>a) Labour</b>		
(i)		Skilled (Sinkers )	day	2.00
		Semi-skilled (Sinking helper)	day	3.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	6.00
		Consumables in sinking @10 per cent of (b)		
(ii)		<b>Beyond 3 m upto 10 m depth</b>		
		<b>a) Labour</b>		
		Skilled (Sinkers)	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>b) Equipment</b> crane with grab bucket Consumables in sinking @10 per cent of (b)	hour	6.00
(iii)	a	<b>Beyond 10 m upto 20 m</b> Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
(iv)	a	<b>Beyond 20 m upto 30 m</b> 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	<b>Beyond 30 m upto 40 m</b> 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	<b>Clayey Soil ( 7 m dia. Well )</b> <i>Unit = meter (For 1 m)</i>		
(I)		<b>Depth below bed level upto 3.0 M</b>		
	a)	<b>Labour</b> Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper )	day	3.00
	b)	<b>Equipment</b> crane with grab bucket Consumables in sinking @ 10 per cent of (b)	hour	6.00
(ii)		<b>Beyond 3 m upto 10 m depth</b>		
	a)	<b>Labour</b> Skilled (Sinker)	day	2.50
		Semi-skilled (Sinking helper )	day	4.00
	b)	<b>Equipment</b> 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	<b>Beyond 10 m upto 20 m</b> 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)		<b>Beyond 20 m upto 30 m</b>		



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)		<b>Beyond 30 m upto 40 m</b>		
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		<b>Soft Rock ( 7 m dia well )</b> <i>Unit = meter. (For 1 m.)</i> <b>Depth in soft rock strata upto 3 m</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	5.00
		Semi-skilled (Sinking helper )	day	10.00
		Diver	day	1.00
		<b>b) Equipment</b>		
		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		<b>Hard Rock ( 7 m dia well )</b> <i>Unit = meter (For 1 m.)</i> <b>Depth in Hard rock strata up to 3 m</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	6.00
		Driller	day	2.00
		Blaster	day	0.25
		Unskilled	day	18.00
		Diver	day	10.50
		<b>b) Material</b>		
		Gelatin	Kg	7.00
		Electric Detonators	nos	30.00
		<b>c) Equipment</b>		
		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).		
	<b>Remarks:</b>	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		
			<b>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.</b>		
			<i>Unit = meter (For 1 m.)</i>		
			<b>Diameter of well - 8 m.</b>		
			<b>Sandy Soil</b>		
			<b>Depth below bed level upto 3.0 M</b>		
			<b>a) Labour</b>		
			Skilled (Sinker)	day	2.00
			Semi-skilled (Sinking helper )	day	3.00
			<b>b) Equipment</b>		
			crane with grab bucket	hour	6.00
			Consumables in sinking @10 per cent of (b)		
			<b>(ii)</b>		
<b>Beyond 3 m upto 10 m depth</b>					
<b>a) Labour</b>					
Skilled (Sinker)	day	3.00			
Semi-skilled (Sinking helper )	day	4.00			
<b>b) Equipment</b>					
crane with grab bucket	hour	6.00			
Consumables in sinking @10 per cent of (b)					
<b>(iii)</b>					
<b>a</b>					
<b>Beyond 10 m upto 20 m</b>					
Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
<b>(iv)</b>					
<b>a</b>					
<b>Beyond 20 m upto 30 m</b>					
Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
<b>b</b>					
Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.					
<b>(v)</b>					
<b>a</b>					
<b>Beyond 30 m upto 40 m</b>					
Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
<b>b</b>					
Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.					
<b>B</b>					
<b>(i)</b>					
<b>Clayey Soil ( 8 m dia. Well )</b>					
<i>Unit = meter (For 1 m.)</i>					
<b>Depth from bed level upto 3.0 M</b>					
<b>a) Labour</b>					
Skilled (Sinker)	day	3.00			
Semi-skilled (Sinking helper )	day	4.00			
<b>b) Equipment</b>					

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)		<b>Beyond 3 m upto 10 m depth</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper )	day	6.00
		<b>b) Equipment</b>		
		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)		<b>Beyond 10 m upto 20 m</b>		
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)		<b>Beyond 20 m upto 30 m</b>		
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)		<b>Beyond upto 40 m</b>		
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		<b>Soft Rock ( 8 m dia well )</b> <i>Unit = meter (For 1 m.)</i> <b>Depth in soft rock strata upto 3 m</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	5.00
		Semi-skilled (Sinking helper )	day	12.00
		Diver	day	1.00
		<b>b) Equipment</b>		
		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		<b>Hard Rock ( dia well )</b>		

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><b>Depth in hard rock strata upto 3 m</b></p> <p><b>a) Labour</b></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>b) Material</b></p> <p>Gelatin Kg 8.00</p> <p>Electric Detonators Nos 32.00</p> <p><b>c) Equipment</b></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><b>Remarks:</b></p> <p>Depth of sinking is reckoned from bed level.</p> <p>Add cost related to security personnel for handling of explosive</p>		
		<p><b>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.</b></p> <p><i>Unit = meter (For 1 m.)</i></p> <p><b>Diameter of well - 10 m.</b></p> <p><b>Sandy Soil</b></p> <p><b>Depth below bed level upto 3.0 M</b></p> <p><b>a) Labour</b></p> <p>Skilled (Sinkers) day 2.00</p> <p>Semi-skilled (Sinking helper ) day 5.00</p> <p><b>b) Equipment</b></p> <p>crane with grab bucket hour 6.00</p> <p>Consumables in sinking @10 per cent of (b)</p>		
	(i)			
	(ii)	<p><b>Beyond 3 m upto 10 m depth</b></p> <p><b>a) Labour</b></p> <p>Skilled (Sinkers) day 3.00</p> <p>Semi-skilled (Sinking helper ) day 6.00</p> <p><b>b) Equipment</b></p> <p>crane with grab bucket hour 6.00</p> <p>Consumables in sinking @10 per cent of (b)</p>		
	(iii)	<p><b>Beyond 10 m upto 20 m</b></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		<b>Beyond 20 m upto 30 m</b> 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		<b>Beyond 30 m upto 40 m</b> 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		<b>Clayey Soil ( dia. Well )</b> <i>Unit = meter (For 1 m.)</i>		
(i)		<b>Depth below bed level upto 3.0 M</b>		
a)		<b>Labour</b>		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper )	day	6.00
b)		<b>Equipment</b>		
		crane with grab bucket	hour	6.00
		Consumables in sinking @ 10 per cent of (b)		
(ii)		<b>Beyond 3 m upto 10 m depth</b>		
a)		<b>Labour</b>		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper )	day	6.00
b)		<b>Equipment</b>		
		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		<b>Beyond 10 m upto 20 m</b> 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		<b>Beyond 20 m upto 30 m</b> 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		<b>Beyond 30 m upto 40 m</b> 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
		Skilled (Sinker)	day	2.00
		Semi-skilled (Sinking helper )	day	4.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	6.00
		Consumables in sinking @10 per cent of (b)		
	(ii)	<b>Beyond 3 m upto 10 m depth</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	3.00
		Semi-skilled (Sinking helper )	day	6.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	12.00
		Consumables in sinking @10 per cent of (b)		
	(iii)	<b>Beyond 10 m upto 20 m</b>		
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	(iv)	<b>Beyond 20 m upto 30 m</b>		
	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>B</b>	<b>Clayey Soil (12 m dia. Well )</b>		
		<i>Unit = meter (For 0.25 m.)</i>		
	(i)	<b>Depth below bed level upto 3.0 M</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper )	day	8.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
	(ii)	<b>Beyond 3 m upto 10 m depth</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	6.00
		Semi-skilled (Sinking helper )	day	9.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	12.00
		Air compressor with pneumatic chisel	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
	(iii)	<b>Beyond 10 m upto 20 m</b>		
	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)		<b>Beyond 20 m upto 30 m</b>			
	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 ).			
	<b>Remarks:</b>		Depth of sinking is reckoned from bed level. Add cost related to security personnel for handling of explosive			
			<b>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.)</b>			
	A		<b>Sandy Soil</b>			
	(i)		<b>Depth from bed level upto 3.0 m</b>			
			<b>a) Labour</b>			
			Skilled (Sinker)	day	2.00	
			Semi-skilled (Sinking helper )	day	4.00	
			<b>b) Equipment</b>			
			crane with grab bucket	hour	6.00	
			Consumables in sinking @10 per cent of (b)			
(ii)	<b>Beyond 3 m upto 10 m depth</b>					
	<b>a) Labour</b>					
	Skilled (Sinker)	day	3.00			
	Semi-skilled (Sinking helper )	day	6.00			
	<b>b) Equipment</b>					
	crane with grab bucket	hour	6.00			
	Consumables in sinking @10 per cent of (b)					
(iii)	<b>Beyond 10 m upto 20 m</b>					
a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
(iv)	<b>Beyond 20 m upto 30 m</b>					
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)	<b>Beyond 30 m upto 40 m</b>					
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		<b>Clayey Soil (Twin D Type Well )</b> <i>Unit = meter (For 1 m.)</i> <i>Taking output = 1 meter</i>		
		<b>(i) Depth below bed level upto 3.0 m</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper )	day	10.00
		<b>b) Equipment</b>		
		crane with grab bucket	hour	12.00
		Consumables in sinking @ 10 per cent of (b)		
		<b>(ii) Beyond 3 m upto 10 m depth</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	4.00
		Semi-skilled (Sinking helper )	day	12.00
<b>b) Equipment</b>				
crane with grab bucket	hour	12.00		
Air compressor with pneumatic chisel	hour	12.00		
Consumables in sinking @ 10 per cent of (b)				
<b>(iii) Beyond 10 m upto 20 m</b>				
<b>a</b>	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter			
<b>b</b>	Add for dewatering @ 5 per cent of cost, if required.			
<b>(iv) Beyond 20 m upto 30 m</b>				
<b>a</b>	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter			
<b>b</b>	Add 5 per cent of cost for dewatering on the cost, if required			
<b>c</b>	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			
C		<b>Soft Rock (Twin D Type Well )</b> <i>Unit = meter (For 1 m.)</i> <i>Taking output = 1 m</i>		
		<b>Depth in soft rock strata upto 20 m</b>		
		<b>a) Labour</b>		
		Skilled (Sinker)	day	6.00
		Semi-skilled (Sinking helper )	day	18.00
		Diver	day	2.00
		<b>b) Equipment</b>		
		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><b>Providing and Filling sand in Wells complete as per Drawing and Technical Specifications.</b>  <i>Unit = cum (For 10 cum)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Sand (assuming 20 per cent voids )</p>	<p>day                      day                      cum</p>	<p>1.00                      4.00                      12.00</p>
17.11	1703	<p><b>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.</b>  <i>Unit = tonne (For 1 tonne)</i></p> <p><b>a) Labour</b>                      Skilled (Fitter+Blacksmith +Welder)                      Unskilled                      Electrodes, cutting gas and other consumables @ 5 per cent on cost (a) above.</p> <p><b>b) Material</b>                      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><b>Providing , Preparing and Installing form work including necessary supports and removing after completion for foundation and footings. (Class F1 Finish)</b></p> <p><b>Using timber (soft wood )</b>  <b>Unit =sqm (For 10 sqm)</b></p> <p><b>a) Labour</b>                      Skilled day 1.5                      Unskilled day 2</p> <p><b>b) Material</b>                      Planks 38 mm thick. cum 0.42                      struts, ballies, etc. cum 0.18                      Nails, spikes, etc. kg 1</p>		
			b	<p><b>Using steel</b>  <b>Unit =sqm (For 10 sqm)</b></p> <p><b>a) Labour</b>                      Skilled day 1.5                      Unskilled day 2.5</p> <p><b>b) Material</b>                      MS sheet 14 gauge &amp; angle stiffners kg 530                      MS pipes dia. 40 mm m 36                      Clamps nos 21                      Nuts &amp; bolts 6 mm dia. ( @approx. 2 kg per 100 nos) nos 178</p>	
		<b>Remarks:</b>	1 Planks 38 mm thick 8 times usage. 2 struts, ballies, etc. 12 times usage 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		
18.2	a	1804, 1805	<p><b>Providing , Preparing and Installing form work including necessary supports and removing after completion for walls. (Class F2 Finish), vertical plain surface</b></p> <p><b>Using timber (soft wood )</b>  <b>Unit =sqm (For 10 sqm)</b></p> <p><b>Height upto 3 m</b></p> <p><b>a) Labour</b>                      Skilled day 2.2                      Unskilled day 2.2</p> <p><b>b) Material</b>                      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	<b>Height above 3 m to 6 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Height above 6 m to 9 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Height above 9 m</b> Increase the rate by 10 % for every additional meter height to the rate for previous height		
	b	<b>Using steel</b> <b>Unit = sqm (For 10 sqm)</b>		
	i	<b>Height upto</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Height above 3 m to 6 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Height above 6 m to 9 m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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	<b>Height above 9 m</b> Increase the rate by 10 % for every additional meter height to the rate for previous height		
		<b>Remarks:</b>		
		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 <b>Providing , Preparing and Installing form work including necessary supports and removing after completion for walls. Class F2 Finish</b>		
	a	<b>Vertical curve surface</b> <b>Using timber</b> <b>Unit =sqm ( For 10 sqm)</b>		
	i	<b>Height upto 3 m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	3 3 11 0.6 4
ii	<b>Height above 3m to 6 m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	3.5 3.8 11 0.72 5	
iii	<b>Height above 6 m to 9 m</b> a) <b>Labour</b>			

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>b) Material</b>				
		Ply wood 9 mm thick.	sqm	11		
		Timber	cum	0.9		
		Nails, spikes, etc.	kg	6		
		<b>Height above 9 m</b>				
		<b>Increase the rate by 10 % for every additional meter height to the rate for previous height</b>				
		<b>Using steel</b>				
		<b>Unit =sqm (For 10 sqm)</b>				
		<b>Height upto 3 m</b>				
		ii	i	<b>a) Labour</b>		
Skilled	day			2		
Unskilled	day			3		
<b>b) Material</b>						
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		
<b>Height above 3 m to 6 m</b>						
<b>a) Labour</b>						
Skilled	day			2.4		
Unskilled	day			3.8		
<b>b) Material</b>						
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		<b>Height above 6 m to 9 m</b>				
		<b>a) Labour</b>				
		Skilled	day	3		
		Unskilled	day	5.4		
		<b>b) Material</b>				
		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		<b>Height more than above 9 m</b>		
				<b>Increase the rate by 10 % for every additional meter height to the rate for previous height</b>		
				<b>Remarks:</b>		
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				
			<b>Providing , Preparing and Installing form work including necessary supports and removing after completion for columns</b>				
			<b>Class F3 Finish</b>				
			<b>Square / Rectangular surface</b>				
			<b>Using timber</b>				
			<b>Unit =sqm (For 10 sqm)</b>				
			<b>Height upto 3 m</b>				
			<b>a) Labour</b>				
			Skilled			day	2.75
Unskilled			day	2.4			
<b>b) Material</b>							
Ply wood 9 mm thick.			sqm	11			
Timber			cum	0.5			
Nails, spikes, etc.			kg	3			
<b>Height above 3 m to 6 m</b>							
<b>a) Labour</b>							
Skilled			day	3.2			
Unskilled			day	3.2			
<b>b) Material</b>							
Ply wood 9 mm thick.			sqm	11			
Timber			cum	0.6			
Nails, spikes, etc.			kg	4			
<b>Height above 6 m to 9 m</b>							
<b>a) Labour</b>							
Skilled			day	4			
Unskilled			day	4.4			
<b>b) Material</b>							
Ply wood 9 mm thick.			sqm	11			
Timber			cum	0.75			
Nails, spikes, etc.			kg	5			
<b>Height above 9 m</b>							
<b>Increase the rate by 10 % for every additional meter height to the rate for previous height</b>							
<b>Using steel</b>							
<b>Unit =sqm ( For 10 sqm)</b>							
<b>Height upto 3 m</b>							
<b>a) Labour</b>							
Skilled			day	2			
Unskilled			day	2.4			
<b>b) Material</b>							
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			
<b>Height above 3 m to 6 m</b>							

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity		
18.5	1804, 1805	<b>a) Labour</b> Skilled Unskilled <b>b) Material</b> MS sheet 14 gauge & angle stiffners 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		
		<b>Height above 6 m to 9 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> MS sheet 14 gauge & angle stiffners 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		
		<b>Height above 9 m</b> <b>Increase the rate by 10 % for every additional meter height to the rate for previous height</b>				
		<b>Remarks:</b> 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 5 Clamps 50 times usage 6 Nuts & bolts 35 times usage				
		<b>Providing , Preparing and Installing form work including necessary supports and removing after completion for columns</b> <b>Class F3 Finish</b> <b>Circular surface</b> <b>Using timber</b> <b>Unit =sqm (For 10 sqm)</b> <b>Height upto 3 m</b>				
		<b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	3.6 3.3 11 0.75 5		
		<b>Height above 3 m to 6 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Ply wood 9 mm thick. Timber Nails, spikes, etc.	day day sqm cum kg	4.2 4.2 11 1 6.5		
		iii				
		iv				



NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity		
iii		<b>Height above 6 m to 9 m</b>				
		<b>a) Labour</b>				
		Skilled	day	5.2		
		Unskilled	day	5.9		
		<b>b) Material</b>				
		Ply wood 9 mm thick.	sqm	11		
		Timber	cum	1.2		
		Nails, spikes, etc.	kg	8		
		iv		<b>Height above 9 m</b>		
		b		<b>Increase the rate by 10 % for every additional meter height to the rate for previous height</b>		
		i		<b>Using steel</b>		
				<b>Unit =sqm ( for 10 sqm)</b>		
ii		<b>Height upto 3 m</b>				
		<b>a) Labour</b>				
		Skilled	day	2.4		
		Unskilled	day	3.3		
		<b>b) Material</b>				
		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		
		iii		<b>Height above 3 m to 6 m</b>		
				<b>a) Labour</b>		
				Skilled	day	2.9
Unskilled	day			4.2		
<b>b) Material</b>						
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		
iv				<b>Height above 6 m to 9 m</b>		
				<b>a) Labour</b>		
				Skilled	day	3.6
		Unskilled	day	2.9		
		<b>b) Material</b>				
		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		
		Remarks:		<b>Height above 9 m</b>		
				<b>Increase the rate by 10 % for every additional meter height to the rate for previous height</b>		
				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	<b>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)</b>				
		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		<b>Using steel Unit =sqm (For 10 sqm)</b>		
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				<b>Using shuttering Ply Unit =sqm (For 10 sqm)</b>		
				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	<b>Remarks:</b>			
				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						
1804, 1805	<b>Providing , Preparing and Installing form work including necessary supports and removing after completion for slab &amp; beam structure. Class F2 Finish False work not included Using timber Unit =sqm (For 10 sqm)</b>						
a) Labour							
Skilled	day			3			
Unskilled	day			3			
b) Material							
Planks 38 mm thick. & rafters, beam, battens etc.	cum	0.82					

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>b</b>	<b>Using steel</b> <b>Unit =sqm (For 10 sqm)</b>		
		<b>a) Labour</b>			
		Skilled	day	2	
		Unskilled	day	3	
		<b>b) Material</b>			
		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	
		<b>c</b>	<b>Using shuttering Ply</b> <b>Unit =sqm (For 10 sqm)</b>		
		<b>a) Labour</b>			
Skilled	day	2.5			
Unskilled	day	3			
<b>b) Material</b>					
Ply wood 12 mm thick.	sqm	11			
Rafter, strut, battens etc.	cum	0.32			
Nails, spikes, etc.	kg	3			
<b>Remarks:</b>					
	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			
		<b>Providing , Preparing and Installing form work including necessary supports and removing after completion for arch structure.</b>			
		<b>Class F2 Finish</b>			
		<b>False work not included</b>			
	<b>a</b>	<b>Using timber</b> <b>Unit =sqm (For 10 sqm)</b>			
	<b>a) Labour</b>				
	Skilled	day	3.5		
	Unskilled	day	3		
	<b>b) Material</b>				
	Ply wood 12 mm thick.	sqm	11		
	Rafters, beam, battens etc.	cum	0.3		
	Nails, spikes, etc.	kg	4		
	<b>b</b>	<b>Using steel</b> <b>Unit =sqm (For 10 sqm)</b>			
	<b>a) Labour</b>				
	Skilled	day	2.5		
	Unskilled	day	3		
	<b>b) Material</b>				
	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
		<b>Remarks:</b>		
		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		
		<b>Providing , Preparing and Installing form work including necessary supports and removing after completion for precast element.</b>		
		<b>Class F3 Finish</b>		
		<b>Square / Rectangular section</b>		
		<b>Using timber</b>		
<b>Unit =sqm (For 10 sqm)</b>				
<b>a) Labour</b>				
Skilled	day	2.5		
Unskilled	day	2		
<b>b) Material</b>				
Ply wood 9 mm thick.	sqm	11		
Timber	cum	0.2		
Nails, spikes, etc.	kg	2		
<b>b</b>				
<b>Using steel</b>				
<b>Unit =sqm (For 10 sqm)</b>				
<b>a) Labour</b>				
Skilled	day	2		
Unskilled	day	2		
<b>b) Material</b>				
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		
<b>II</b>				
<b>a</b>				
<b>Circular section</b>				
<b>Using timber</b>				
<b>Unit =sqm (For 10 sqm)</b>				
<b>a) Labour</b>				
Skilled	day	3		
Unskilled	day	2.5		
<b>b) Material</b>				
Ply wood 9 mm thick.	sqm	11		
Timber	cum	0.2		
Nails, spikes, etc.	kg	3		
<b>b</b>				
<b>Using steel</b>				
<b>Unit =sqm (For 10 sqm)</b>				
<b>a) Labour</b>				
Skilled	day	2.5		
Unskilled	day	2		
<b>b) Material</b>				
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	<b>Curved precast elements Multiply the rates for straight elements as determined above by 1.25</b>		
	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	<b>Providing and assembling in position falsework for the construction of RCC superstructure and removing after completion including design &amp; drawings as per specification For Slab and Box culverts Using timber Unit = ( 10 sqm of form work)</b>		
	a			
	i)	<b>Height upto 2 m</b>		
		a) <b>Labour</b>		
		Skilled	day	8
		Unskilled	day	8
		b) <b>Material</b>		
		Timber	cum	0.8
		Nails, spikes, etc.	kg	2.5
	ii)	<b>Height above 2 m to 4 m</b>		
		a) <b>Labour</b>		
		Skilled	day	16
		Unskilled	day	18
		b) <b>Material</b>		
		Timber	cum	1.4
		Nails, spikes, etc.	kg	4
	iii)	<b>Height above 4 m to 6 m</b>		
		a) <b>Labour</b>		
		Skilled	day	24
		Unskilled	day	28
		b) <b>Material</b>		
		Timber	cum	1.9
		Nails, spikes, etc.	kg	5.5
	iv)	<b>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>		
	b	<b>Using steel</b>		
		<b>Unit =sqm (For 10 sqm of form work)</b>		
	i)	<b>Height upto 2 m</b>		
		a) <b>Labour</b>		
		Skilled	day	4
		Unskilled	day	6

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
18.11		<b>b) Material</b> MS pipes dia. 40 - 50 mm Clamps Nuts & bolts 6 mm dia. ( @approx. 2 kg per 100 nos)	m nos nos	240 137 178
		<b>ii) Height above 2 m to 4 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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
		<b>iii) Height above 4 m to 6 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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
		<b>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</b>		
		<b>Remarks:</b> 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		
		<b>1803 Providing and assembling in position falsework for the construction of RCC superstructure and removing after completion including design &amp; drawings as per specification, for RCC Beam Bridge</b>		
		<b>a) Using timber</b> <b>Unit =sqm (For 10 sqm of form work)</b>		
		<b>i) Height upto 3 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Timber Nails, spikes, etc.	day day cum kg	14 14 2 6
		<b>ii) Height above 3 m to 6 m</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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)	<b>Height above 6 m to 9 m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> Timber Nails, spikes, etc.	day day  cum kg	40 50  7 21
	iv)	<b>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>		
	b	<b>Using steel</b>		
		<b>Unit =sqm (For 10 sqm of form work)</b>		
	i)	<b>Height upto 3 m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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)	<b>Height above 3 m to 6m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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)	<b>Height above 6 m to 9m</b> a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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)	<b>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>		
	<b>Remarks:</b>	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	<b>Providing and assembling in position falsework for the construction of RCC superstructure and removing after completion including design &amp; drawings as per specification, for RCC Arch Bridge</b>		
	a		<b>Using timber</b>		
			<b>Unit = sqm (For 10 sqm of form work)</b>		
	i)		<b>Height upto 3 m</b>		
			<b>a) Labour</b>		
			Skilled	day	18
			Unskilled	day	16
			<b>b) Material</b>		
			Timber	cum	1.2
			Nails, spikes, etc.	kg	3.5
	ii)		<b>Height above 3m to 6 m</b>		
			<b>a) Labour</b>		
			Skilled	day	36
			Unskilled	day	36
			<b>b) Material</b>		
			Timber	cum	2.4
			Nails, spikes, etc.	kg	7
	iii)		<b>Height above 6 m to 9 m</b>		
			<b>a) Labour</b>		
			Skilled	day	50
			Unskilled	day	57
			<b>b) Material</b>		
			Timber	cum	4.2
			Nails, spikes, etc.	kg	12
	iv)		<b>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>		
	b		<b>Using steel</b>		
			<b>Unit = sqm (For 10 sqm of form work)</b>		
	i)		<b>Height upto 3 m</b>		
			<b>a) Labour</b>		
			Skilled	day	8
			Unskilled	day	12
			<b>b) Material</b>		
			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)		<b>Height above 3 m to 6 m</b>		
			<b>a) Labour</b>		
			Skilled	day	16
			Unskilled	day	25
			<b>b) Material</b>		
			MS pipes dia. 40 mm	m	720
			Clamps	nos	410
			Nuts & bolts 6 mm dia. ( @approx. 2 kg per 100 nos)	nos	178
	iii)		<b>Height above 6 m to 9 m</b>		



NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><b>a) Labour</b>  Skilled  Unskilled</p> <p><b>b) Material</b>  MS pipes dia. 40 mm  Clamps  Nuts &amp; bolts 6 mm dia. ( @approx. 2 kg per 100 nos)</p>	day day m nos nos	25 46 1180 674 178
	iv)	<p><b>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></p>		
	Remarks:	<p>a. Add 3% of total unit rate of false work for the design and drawings</p>		
	1	Timber (struts, ballies, etc.) 8 times usage		
	2	MS sheet 14 gauge & angle stiffeners 40 times usage		
	3	MS pipes 60 times usage		
	4	Clamps 40 times usage		
	Remarks for False Work:	<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.</p> <p>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.</p> <p>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>		

**SECTION 1900 - BEARING AND EXPANSION JOINTS**

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
19.1	1902	<p><b>Supplying, fitting and fixing in position true to line and level cast steel rocker bearing including all accessories as per Drawing and Technical Specifications.</b>  <b>Unit: tonne (For upto 250 tonne capacity bearing)</b></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      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
	<b>Remarks:</b>	Bearing shall have at least 250 tonne capacity, fore more than 250 tonne capacity add per tonne rate .		
19.2	1902	<p><b>Supplying, fitting and fixing in position true to line and level forged steel roller bearing including all accessories as per Drawing and Technical Specifications.</b>  <b>Unit: tonne ( for upto 250 tonne capacity)</b></p> <p><b>a) Labour</b>                      Unskilled                      Skilled</p> <p><b>b) Material</b>                      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
	<b>Remarks:</b>	Bearing shall have at least 250 tonne capacity, fore more than 250 tonne capacity add per tonne rate .		
19.3	1902	<p><b>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 &amp; 9.2 for PTFE) ).</b>  <b>Unit: tonne (For upto 80 tonne capacity bearing)</b></p> <p><b>a) Labour</b>                      Unskilled                      Skilled</p> <p><b>b) Material</b>                      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><b>Supplying, fitting and fixing in position true to line and level elastomeric bearing including all accessories as per Drawing and Technical Specifications.</b></p> <p><b>Unit: cubic centimeter (Considering an elastomeric bearing of size 500 x 400 x 96 mm .)</b></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><b>a) Labour</b></p> <p>Unskilled</p> <p>Skilled</p> <p><b>b) Material</b></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><b>Remarks:</b></p>		
19.5	1902	<p><b>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.</b></p> <p><b>Unit: tonne (Considering a 80 tonne capacity bearing)</b></p> <p><b>a) Labour</b></p> <p>Unskilled</p> <p>Skilled</p> <p><b>b) Material</b></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><b>Remarks:</b></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><b>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.</b></p> <p><i>Unit: tonne (For Considering a 250 tonne capacity bearing )</i></p> <p><b>a) Labour</b> Unskilled Skilled</p> <p><b>b) Material</b> 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
	<b>Remarks:</b>	Bearing shall have at least 250 tonne capacity, fore more than 250 tonne capacity add per tonne rate .		
19.7	1901	<p><b>Buried Joint</b> <b>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.</b> <i>Unit = meter (For 12 m)</i></p> <p><b>a) Labour</b> Unskilled Skilled</p> <p><b>b) Material</b> 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><b>Elastomeric Slab Steel Expansion Joint</b> <b>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</b> <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) <b>Labour</b> Unskilled Skilled</p> <p>b) <b>Material</b> 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><b>Joint has to be installed by the manufacturer/supplier or their authorized representative ensuring compliance to the manufacturer's instructions for installation</b></p>	day day meter	1.00 1.00 12.00
		<p><b>Compression Seal Joint</b> <b>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.</b> <i>Unit = meter (For 12 m)</i></p> <p>a) <b>Labour</b> Unskilled Skilled</p> <p>b) <b>Material</b> 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><b>Remarks:</b> 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. <b>modify weight of angle if designed angle is different than above</b></p>	day day kg meter	1.00 1.00 446.00 12.00
19.10	1901	<p><b>Strip Seal Expansion Joint</b> <b>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.</b> <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) <b>Labour</b> Unskilled Skilled</p> <p>b) <b>Material</b> 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><b>Remarks:</b></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><b>Modular Strip / Box Seal Joint</b> <b>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 .</b> <i>Unit = meter (For 12 m)</i></p> <p>a) <b>Labour</b> Unskilled Skilled</p> <p>b) <b>Material</b> 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><b>Modular Strip / Box Seal Joint</b> <b>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.</b> <i>Unit = Running meter (For 12 m)</i> <i>Taking output = 12 m</i></p> <p>a) <b>Labour</b> Unskilled Skilled</p> <p>b) <b>Material</b></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><b>Remarks:</b></p> <ol style="list-style-type: none"> <li>1. The installation shall be done by the manufacturer or his authorized representative to the satisfaction of the Engineer.</li> <li>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.</li> <li>3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.</li> </ol>	meter	12.00

**SECTION 2000 - CONCRETE FOR STRUCTURES**

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
20.1	2000	<p><b>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.</b>  <i>Unit = cum (For 15 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 2                      Unskilled day 22</p> <p><b>b) Material</b>                      40 mm Aggregate cum 13.5                      coarse Sand cum 6.75                      cement tonne 3.45                      Cost of water KL 2</p> <p><b>c) Equipment</b>                      Concrete mixer hour 6                      Generator hour 6</p>		
	<b>Remarks:</b>	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><b>Providing and laying of Plain/Reinforced Cement Concrete in Foundation complete as per Drawing and Technical Specifications.</b>  <b>PCC Grade M 15</b>  <i>Unit = cum (For 15 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 3                      Unskilled day 30</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      Concrete mixer hour 6                      Generator hour 6</p> <p><b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of Material, Labour and Equipment</b></p>		
	<b>Remarks:</b>	1. In case of manual mixed concrete add 50 % of Labour component and reduce Equipment		
	B	<b>PCC Grade M 20</b>		



NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<b>Unit : cum (For 15 cum)</b>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of Material, Labour and Equipment</b>		
	<b>C</b>	<b>RCC Grade M 20</b>		
		<b>Unit = cum (For 15 cum)</b>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>d) Formwork @ 4 per cent on (a+b+c)</b>		
	<b>D</b>	<b>PCC Grade M 25</b>		
		<b>Unit = cum (For 15 cum)</b>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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		
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>d) Formwork @ 3.75 per cent of (a+b+c)</b>		
		<b>RCC Grade M 25</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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			
<b>c) Equipment</b>				
Concrete mixer	hour	6		
Generator	hour	6		
<b>d) Formwork @ 3.75 per cent of (a+b+c).</b>				
F		<b>PCC Grade M 30</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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	
		<b>c) Equipment</b>		
Concrete mixer	hour	6		
Generator	hour	6		
<b>d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of Material, Labour and Equipment</b>				
G		<b>RCC Grade M30</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled Unskilled <b>b) Material</b> Cement Coarse sand 20 mm Aggregate 10 mm Aggregate Cost of water Admixture @ 0.4 per cent of cement/ as per mix design <b>c) Equipment</b> Concrete mixer Generator <b>d) Formwork @ 3.5 per cent on cost of concrete i.e. cost of Material, Labour and Equipment</b>	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	<b>RCC Grade M 35</b> <i>Unit = cum (For 15 cum)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Cement Coarse sand 20 mm Aggregate 10 mm Aggregate Cost of water Admixture @ 0.4 per cent of cement/ as per mix design <b>c) Equipment</b> Concrete mixer Generator <b>d) Formwork @ 3 per cent on a+b+c</b>	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
		<b>Remarks:</b> 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><b>Providing and laying , fitting and placing un-coated Mild steel / HYSD reinforcement complete in foundation as per drawing and technical specification</b>  <i>Unit = tonne (For 1 MT)</i></p> <p><b>a) Labour</b>                      Skilled / Blacksmith                      Unskilled</p> <p><b>b) Material</b>                      MS bars                      Binding wire</p>	day day tonne Kg	4 9 1.1 8
20.4		2000	<p><b>Providing and laying of Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications</b>  <i>Unit = cum (For 1 cum)</i></p> <p><b>A</b>  <b>PCC Grade M 15</b>  <b>Height upto 5 m</b>  <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (A)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p> <p><b>B</b>  <b>PCC Grade M20</b>  <b>Height upto 5 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (B)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p> <p><b>C</b>  <b>(p)</b>  <b>PCC Grade M 25</b>  <b>Height upto 5 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of item 20.2(D)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p> <p><b>(q)</b>  <b>Height above 5 m to 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (D)</b>  <b>d) formwork</b>                      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><b>(r)</b>  <b>Height above 10 m</b></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (D)</b>  <b>d) formwork</b>                      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)	<p><b>PCC Grade M 30</b>  <b>Height upto 5 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (F)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
(q)		<p><b>Height above 5 m to 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (F)</b>  <b>d) formwork</b>                      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><b>Height above 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (F)</b>  <b>d) formwork</b>                      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)	<p><b>RCC Grade M 20</b>  <b>Height upto 5 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (C)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
(q)		<p><b>Height above 5 m to 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (C)</b>  <b>d) formwork</b>                      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><b>Height above 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (C)</b>  <b>d) formwork</b>                      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><b>RCC Grade M 25</b>  <b>Height upto 5 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (E)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
	(q)	<p><b>Height above 5 m to 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (E)</b>  <b>d) formwork</b>                      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><b>Height above 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (E)</b>  <b>d) formwork</b>                      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><b>RCC Grade M 30</b>  <b>Height upto 5 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (G)</b>  <b>d) formwork</b>                      Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork</p>		
	(q)	<p><b>Height above 5 m to 10 m</b>  <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (G)</b>  <b>d) formwork</b>                      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)	<b>Height above 10 m</b> <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (G) Case</b> <b>d) formwork</b> 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		
	H (p)	<b>RCC Grade M 35</b> <b>Height upto 5 m</b> <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (H)</b> <b>d) formwork</b> Add 10 % of cost of Material, Labour and Equipment (a+b+c) for Formwork		
	(q)	<b>Height above 5 m to 10 m</b> <b>Per Cum Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (H)</b> <b>d) formwork</b> 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		
	(r)	<b>Height above 10 m</b> <b>Basic Cost of Labour, Material &amp; Equipment (a+b+c) of Item 20.2 (H)</b> <b>d) formwork</b> 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		
	<b>Remarks:</b>	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.		
20.5	2014	<b>Providing and laying , fitting and placing HYSD bar reinforcement in sub-structure complete as per Drawing and Technical Specifications</b> <b>Unit= tonne (For 1 tonne)</b> <b>a) Labour for cutting, bending, shifting to site, tying and placing in position</b> Skilled ( Blacksmith)	day	4

NORMS FOR RATE ANALYSIS

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



NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>For formwork and staging add the following:</b>		
(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 20 % of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % of (a+b+c)</b>		
(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 35 % of (a+b+c)</b>		
	<b>B</b>	<b>RCC Grade M 25</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	30
		<b>b) Material</b>		
		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	
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>For formwork and staging add the following:</b>		
(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 20 % of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % of (a+b+c)</b>		
(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 35 % of (a+b+c)</b>		
C		<b>RCC Grade M 30</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	32
		<b>b) Material</b>		
		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	
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>For formwork and staging add the following:</b>		
(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 20 % of (a+b+c)</b>		
(q)		<b>Height above 5m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>Formwork and staging 25 % of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % of (a+b+c)</b>		
(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 35 % of (a+b+c)</b>		
D		<b>RCC/PSC Grade M 35</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	32
		<b>b) Material</b>		
		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	
		<b>c) Equipment</b>		

NORMS FOR RATE ANALYSIS

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

NORMS FOR RATE ANALYSIS

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

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>For formwork and staging add the following:</b>		
(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 20 % per cent of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % per cent of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum		
		<b>d) Formwork and staging 30 % per cent of (a+b+c)</b>		
(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % per cent of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % per cent of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 35 % per cent of (a+b+c)</b>		
<b>G</b>		<b>PSC Grade M-50</b>		
		<i>Unit = cum (For 15 cum)</i>		
		<b>a) Labour</b>		
		Skilled	day	5
		Unskilled	day	30
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		Concrete mixer	hour	6
		Generator	hour	6
		<b>For formwork and staging add the following:</b>		
(i)		<b>For solid slab super-structure, 20-30 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 20 % per cent of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % per cent of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % per cent of (a+b+c)</b>		
(ii)		<b>For T-beam &amp; slab, 25-35 per cent of (a+b+c)</b>		
(p)		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % per cent of (a+b+c)</b>		
(q)		<b>Height above 5 m to 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 30 % per cent of (a+b+c)</b>		
(r)		<b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum		
		<b>d) Formwork and staging 35 % per cent of (a+b+c)</b>		
	<b>Remarks</b>	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><b>Providing and laying , fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications</b>  <b>Unit = tonne (For 1 tonne)</b></p> <p><b>a) Labour for cutting, bending, tying and placing in position</b></p> <p>Skilled (Blacksmith) day 4                      Unskilled day 12</p> <p><b>b) Material</b></p> <p>HYSD bars tonne 1.1                      Binding wire Kg 8</p>		
20.10			<p><b>Providing and laying of PCC M 15 Grade leveling course below approach slab complete as per drawing and Technical specification</b>  <b>Unit = cum (For 1 cum)</b></p> <p><b>Material</b></p> <p>Concrete, Rate as per item No. 20.2 (A) excluding formworks cum 1</p>		
20.11		2014	<p><b>Providing and laying of Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification</b>  <b>Unit = cum (For 1 cum)</b></p> <p><b>a) Material</b></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.</p> <p>HYSD bar reinforcement Rate tonne 0.05</p>		
		<b>Remarks:</b>	The grade of reinforced cement concrete may be adopted as for severe conditions and for moderate conditions.		
20.12		2000	<p><b>Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications</b>  <b>Unit = cum (For 1 cum)</b></p> <p><b>a) Labour</b></p> <p>Skilled day 2                      Unskilled day 2</p> <p><b>b) Material</b></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><b>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.</b>  <i>Unit = tonne ( For 0.377 tonne)</i>                      Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)</p> <p><b>a) Labour</b></p> <p><b>i) For making and fixing cables, anchorages</b>                      Technician day 1.00                      Skilled (Blacksmith) day 2.00                      Unskilled day 5.00</p> <p><b>ii) For pre-stressing</b>                      Technician day 1.00                      Skilled (Pre-stressing operator / Fitter) day 1.00                      Unskilled day 2.00</p> <p><b>iii) For grouting</b>                      Technician day 1.00                      Skilled ( Mason) day 1.00                      Unskilled day 2.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      Stressing jack with pump hour 2.50                      Grouting pump with agitator hour 1.00                      Generator hour 3.50</p>		
	<b>Remarks</b>	Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.		
21.2	2000, 2100	<p><b>Precast - pre-tensioned Girders</b></p> <p><b>Providing, pre-casting, transportation and placing in position precast pre-tensioned concrete girders as per drawing and technical specifications</b>  <i>Unit = cum (For 10 cum)</i>                      Grade of concrete - M 40</p> <p><b>a) Labour</b></p> <p><b>(i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete</b></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
		<b>(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.</b>		
		<i>Taking quantity of HT strand 60 Kg/cum</i>		
		Technician	day	1.00
		Skilled	day	2.00
		Unskilled	day	5.00
		<b>(iii) Erection and dismantling of shuttering</b>		
		<i>Taking shuttering area 10 sqm/cum of concrete</i>		
		Technician	day	1.00
		Skilled	day	10.00
		Unskilled	day	20.00
		<b>(iv) Concreting by Batching plant or concrete mixture and stationary concrete pump</b>		
		Skilled	day	1.00
		Unskilled	day	12.00
		<b>(v) Steam curing and manual curing</b>		
		Skilled	day	1.00
		Unskilled	day	4.00
		<b>(vi) Handling of precast girder, stacking in stockyard and again loading in trailer</b>		
		Skilled	day	1.00
		Unskilled	day	3.00
		<b>(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.</b>		
		Skilled	day	1.00
		Unskilled	day	3.00
		<b>b) Material</b>		
		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		
		<b>c) Equipment</b>		
		<b>i) At casting yard</b>		
		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
		<b>ii) For transportation and placement at site</b>		
		Crane	hour	2.00
		Cost of formwork, steam curing arrangement, pre-tensioning arrangement etc. @ 5 per cent of cost material, Labour and Equipment		
		<b>Providing and fixing Helical pipes in voided concrete slabs as per Drawing and Technical Specifications.</b>		
		<i>Unit = meter (For 10 m)</i>		
		<b>a) Labour</b>		
Technician	day	1.00		
Skilled ( Fitter)	day	1.00		
Unskilled	day	3.00		
<b>b) Material</b>				
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><b>Providing , Fabricating , assembling and erecting structural steel components / elements including nut, bolt, gusset plate, including shop drawings, facilities for inspection &amp; testing and trial assembling all complete as per specification.</b>  <i>Unit = tonne ( For 1 tonne)</i></p> <p><b>RS Joist</b></p> <p><b>a) Labour</b></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>b) Material</b></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><b>c) Equipment</b></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><b>For formwork and staging add the following:</b></p> <p><b>Height upto 5 m</b></p> <p>Basic Cost of Labour, Material &amp; Equipment (a+b+c)</p> <p><b>d) Formwork and staging per cent of (a+b+c)</b></p>		
	(q)		<p><b>Height above 5 m to 10 m</b></p> <p>Basic Cost of Labour, Material &amp; Equipment (a+b+c)</p> <p><b>d) Formwork and staging per cent of (a+b+c)</b></p>		
	(r)		<p><b>Height above 10 m</b></p> <p>Basic Cost of Labour, Material &amp; Equipment (a+b+c) for 15 cum</p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<b>d) Formwork and staging per cent of (a+b+c)</b>		
	<b>Remarks:</b>	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>B</b>	<b>Built up beam, Plate Girder etc.</b>		
		<b>A) Labour</b>		
		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
		<b>a) Material</b>		
		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		
		<b>c) Equipment</b>		
		crane	hour	6.00
		Add 5.0 per cent cost of steel for cutting, drilling, grinding welding et		
	<b>(p)</b>	<b>For formwork and staging add the following:</b>		
		<b>Height upto 5 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c)		
		<b>d) Formwork and staging 25 % of (a+b+c)</b>		
	<b>(q)</b>	<b>Height 5 m to 10 m</b>		

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) <b>d) Formwork and staging 30 % of (a+b+c)</b> <b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c) <b>d) Formwork and staging 35 % of (a+b+c)</b>		
	<b>Remarks:</b>	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	<b>Truss</b> <b>a) Labour</b> 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>b) Material</b> 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
		<b>c) Equipment</b> Crane Add 5.0 per cent cost of steel for cutting, drilling, grinding welding etc.	hour	6.00
	(p)	<b>For formwork and staging add the following:</b> <b>Height upto 5 m</b>		

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) <b>d) Formwork and staging 30 % of (a+b+c)</b>  <b>Height 5 m to 10 m</b>		
	(r)	Basic Cost of Labour, Material & Equipment (a+b+c) <b>d) Formwork and staging 35 % of (a+b+c)</b>  <b>Height above 10 m</b>		
		Basic Cost of Labour, Material & Equipment (a+b+c) for 15 cum <b>d) Formwork and staging 40 % of (a+b+c)</b>		
	<b>Remarks:</b>	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><b>Providing , Fabricating , assembling and erecting Timber super structures including necessary hardware</b>  <b>Unit = cum (For 1 cum)</b>  <b>Beam structure</b>  <b>a) Labour</b>                      i) for Fabricating/ assembling                      Skilled (Carpenter) day 5                      Unskilled day 5                      ii) for Erecting                      Skilled (Carpenter) day 5                      Unskilled day 10  <b>b) Material</b>                      Sal wood cum 1.1                      Add 5.0 per cent cost of timber for hardware / consumables  <b>c) Equipment</b>                      Add 1.0 per cent cost of Timber for cutting, drilling, etc.  <b>For staging add the following:</b>  <b>(p) Height upto 4 m</b>                      Basic Cost of Labour, Material &amp; Equipment (a+b+c)  <b>d) For staging 15 % of (a+b+c)</b>  <b>(q) Height 4 m to 6 m</b>                      Basic Cost of Labour, Material &amp; Equipment (a+b+c)  <b>d) For staging 20 % of (a+b+c)</b>  <b>(r) Height above 6 m</b>                      Basic Cost of Labour, Material &amp; Equipment (a+b+c)  <b>d) For staging 25 % of (a+b+c)</b></p>		
		<b>Remarks:</b>	Cost of Timber has been taken for delivery at site. Hence carriage has not been considered.		
	B		<p><b>Truss structure</b>  <b>a) Labour</b>                      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>b) Material</b>                      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><b>c) Equipment</b>                      Add 1.0 per cent cost of Timber for cutting, drilling, etc.</p> <p><b>For formwork and staging add the following:</b></p> <p><b>(p) Height upto 4 m</b>                      Basic Cost of Labour, Material &amp; Equipment (a+b+c)  <b>d) Formwork and staging 20 % of (a+b+c)</b></p> <p><b>(q) Height 4 m to 6 m</b>                      Basic Cost of Labour, Material &amp; Equipment (a+b+c)  <b>d) Formwork and staging 25 % of (a+b+c)</b></p> <p><b>(r) Height above 6 m</b>                      Basic Cost of Labour, Material &amp; Equipment (a+b+c)  <b>d) Formwork and staging 30 % of (a+b+c)</b></p> <p><b>Remarks:</b> 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	<b>Gabion Structure for Retaining Earth</b> <b>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</b>		
	A		<b>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,</b>		
			<b>Box size 3 X 1 X 1 m ( 16 sqm)</b> Unit = cum (For 3X1X2 nos =6 cum)		
			<b>a) Labour</b>		
			Unskilled	day	7
			Skilled	day	3
			<b>b) Material</b>		
			Mesh wire	kg	70.2
			Selvedge Wire	kg	7.82
			Binding wire	kg	3.62
			Boulder / Stone	cum	6.6
			<b>ii</b>		
			<b>Box size 2 X 1 X 1 m ( 11 sqm)</b> Unit = cum ( For 2 X 1 X 1X 3 nos = 6 cum)		
			<b>a) Labour</b>		
			Unskilled	day	7
			Skilled	day	3
			<b>b) Material</b>		
			Mesh wire	kg	72.45
			Selvedge Wire	kg	8.88
			Binding wire	kg	3.9
			Boulder / Stone	cum	6.6
			<b>iii</b>		
			<b>Box size 1.5 X 1 X 1 m ( 9 sqm )</b> Unit = cum ( For 1.5 X 1 X 1X 4 nos = 6 cum)		
			<b>a) Labour</b>		
			Unskilled	day	8
			Skilled	day	3
			<b>b) Material</b>		
			Mesh wire	kg	79
			Selvedge Wire	kg	10.8
			Binding wire	kg	5
			Boulder / Stone	cum	6.6
			<b>iv</b>		
			<b>Box size 1.0 X 1 X 1 m ( 6 sqm)</b> Unit = cum ( For 1.0 X 1 X 1X 6 nos = 6 cum)		
			<b>a) Labour</b>		
			Unskilled	day	8
			Skilled	day	3
			<b>b) Material</b>		

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	<b>Box size 3.0 X 1 X 0.75 m ( 13.5 sqm)</b> <b>Unit = cum ( For 3.0 X 1 X 0.75 X 2 nos= 4.5 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	6
		Skilled	day	2
		<b>b) Material</b>		
		Mesh wire	kg	59.24
		Selvedge Wire	kg	7.18
		Binding wire	kg	3.34
		Boulder / Stone	cum	4.95
	vi	<b>Box size 2.0 X 1 X 0.75 m ( 9.25 sqm)</b> <b>Unit = cum ( For 2.0 X 1 X 0.75 X 4 nos= 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	8
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	81.16
		Selvedge Wire	kg	10.8
		Binding wire	kg	4.72
		Boulder / Stone	cum	6.6
	vii	<b>Box size 1.0 X 1 X 0.75 m ( 5 sqm m)</b> <b>Unit = cum ( For 1.0 X 1 X 8 nos= 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	8
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	87.76
		Selvedge Wire	kg	14.4
		Binding wire	kg	5.92
		Boulder / Stone	cum	6.6
	viii	<b>Box size 3.0 X 1 X 0.5 m ( 11 sqm)</b> <b>Unit = cum ( For 3.0 X 1 X 0.5 X 4 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	8
		Skilled	day	3
		<b>b) Material</b>		
		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	<b>Box size 2.0 X 1 X 0.5 m ( 7.5 sqm m)</b> <b>Unit = cum ( For 2.0 X 1 X. 0.5 X 6 nos= 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	9
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	98.7
		Selvedge Wire	kg	14.57
		Binding wire	kg	5.1
		Boulder / Stone	cum	6.6
	x	<b>Box size 1 X 1 X 0.5 m (4 sqm)</b> <b>Unit = cum (For x 1 x 0.5 X 12 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	9
		Skilled	day	4
		<b>b) Material</b>		
		Mesh wire	kg	105.36
		Selvedge Wire	kg	19.08
		Binding wire	kg	6.24
		Boulder / Stone	cum	6.6
	xi	<b>Box size 3 X 1 X 0.3 m ( 9 sqm)</b> <b>Unit = cum ( For 3.0 X 1 X 0.3 X 7 nos = 6.3 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	10
		Skilled	day	4
		<b>b) Material</b>		
		Mesh wire	kg	138.25
		Selvedge Wire	kg	21.18
		Binding wire	kg	5.53
		Boulder / Stone	cum	6.93
	Xii	<b>Box size 2 X 1 X 0.3 m ( 6.1 sqm)</b> <b>Unit = cum ( For 2.0 X 1 X 0.3 X 10 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	9
		Skilled	day	3
		<b>b) Material</b>		
		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		<b>Box size 1 X 1 X 0.3 m ( 2.2 sqm)</b> <b>Unit = cum ( For 1.0 X 1 X 0.3 X 20 nos = 6 cum)</b>		
			<b>a) Labour</b>		
			Unskilled	day	9
			Skilled	day	3
			<b>b) Material</b>		
			Mesh wire	kg	96.6
			Selvedge Wire	kg	28.27
			Binding wire	kg	7.2
			Boulder / Stone	cum	6.6
	B	2401	<b>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,</b>		
	i		<b>Box size 3 X 1 X 1 m ( 16 sqm)</b> <b>Unit = cum (For 3.0 X 1 X 1 X 2 nos = 6 cum)</b>		
			<b>a) Labour</b>		
			Unskilled	day	8
			Skilled	day	3
			<b>b) Material</b>		
			Mesh wire	kg	82.6
			Selvedge Wire	kg	7.82
			Binding wire	kg	4.12
			Boulder / Stone	cum	6.6
	ii		<b>Box size 2 X 1 X 1 m ( 11 sqm)</b> <b>Unit = cum (For 2 X 1 X 1 X 3 nos = 6 cum)</b>		
			<b>a) Labour</b>		
			Unskilled	day	8
			Skilled	day	3
			<b>b) Material</b>		
			Mesh wire	kg	85.2
			Selvedge Wire	kg	8.87
			Binding wire	kg	4.38
			Boulder / Stone	cum	6.6
	iii		<b>Box size 1.5 X 1 X 1 m ( 9 sqm)</b> <b>Unit = 1 cum (For 1.5 x 1X 4 nos = 6 cum)</b>		
			<b>a) Labour</b>		
			Unskilled	day	8
			Skilled	day	3
			<b>b) Material</b>		

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	<b>Box size 1 X 1 X 1 m ( 6 sqm)</b> <b>Unit = cum (For 1 x 1X 6 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	8
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	92.94
		Selvedge Wire	kg	12.07
		Binding wire	kg	5.22
		Boulder / Stone	cum	6.6
	v	<b>Box size 3.0 X 1 X 0 .75 m (13.5 sqm)</b> <b>Unit = cum (For 3 x 1 x 0 .75 X 2 nos = 4.5 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	8
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	69.7
		Selvedge Wire	kg	7.18
		Binding wire	kg	3.8
		Boulder / Stone	cum	4.95
	vi	<b>Box size 2.0 X 1 X 0 .75 m ( 9.25 sqm)</b> <b>Unit = cum (For 2 x . = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	8
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	95.52
		Selvedge Wire	kg	10.79
		Binding wire	kg	5.4
		Boulder / Stone	cum	6.6
	vii	<b>Box size 1.0 X 1 X 0 .75 m ( 5 sqm)</b> <b>Unit = cum (For 8 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	9
		Skilled	day	3
		<b>b) Material</b>		
		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	<b>Box size 3.0 X 1 X 0.5 m ( 11 sqm)</b> <b>Unit = For ( 3 X 1 X 0.5 X 4 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	9
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	113.6
		Selvedge Wire	kg	13.11
		Binding wire	kg	5.44
		Boulder / Stone	cum	6.6
	ix	<b>Box size 2.0 X 1 X 0.5 m ( 7.5 sqm)</b> <b>Unit= cum (For 6 nos = 6 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	9
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	116.4
		Selvedge Wire	kg	14.57
		Binding wire	kg	6.18
		Boulder / Stone	cum	6.6
	x	<b>Box size 1 X 1 X 0.5 m ( 4 sqm)</b> <b>Unit = cum ( For x 12 nos = )</b>		
		<b>a) Labour</b>		
		Unskilled	day	10
		Skilled	day	3
		<b>b) Material</b>		
		Mesh wire	kg	123.96
		Selvedge Wire	kg	19.04
		Binding wire	kg	7.56
		Boulder / Stone	cum	6.6
	xi	<b>Box size 3 X 1 X 0.3 m ( 9 sqm)</b> <b>Unit = cum (For x 0.3 X 7 nos = 6.3 cum)</b>		
		<b>a) Labour</b>		
		Unskilled	day	11
		Skilled	day	4
		<b>b) Material</b>		
		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	<b>Box size 2 X 1 X 0 .3 m ( 6.1 sqm)</b> <b>Unit = cum (For x 10 nos = 6 cum)</b> <b>a) Labour</b> Unskilled Skilled <b>b) Material</b> 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	<b>Box size 1 X 1 X 0 .3 m ( 2.2 sqm)</b> <b>Unit = cum (For 20 nos = 6 cum)</b> <b>a) Labour</b> Unskilled Skilled <b>b) Material</b> 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	<b>Providing mechanically woven double twisted crates / mattress including rolling, cutting and with lacing wire and binding wire as per specification.</b>		
	A	<b>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</b>	sqm	1
	B	<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</b>	sqm	1
	C	<b>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</b>	sqm	1
	D	<b>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</b>	sqm	1
	E	<b>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</b>	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
		<b>Remarks:</b>	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
		<b>Remarks:</b>	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	<b>Providing and laying and fixing of Geo-membrane all complete as per specification.</b> <b>Unit = sqm (For 300 sqm)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Geotextile	day day sqm	1 2 360
		Remarks: Geotextile is including 20 % overlap		
24.7	2404	<b>GEOSYNTHETIC AND REINFORCED EARTH</b> <b>Sub-Surface Drain with Geotextiles</b> <b>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.</b> <b>Unit = meter (For 10 m.)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>Narrow Filter Sub-Surface Drain</b> <b>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</b> <b>Unit = meter (For 10 m)</b>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Perforated geosynthetic pipe 150 mm dia                      Geotextile filter fabric                      Add 2 per cent cost of Material for miscellaneous item like synthetic cord</p>	day day meter sqm	2 10 11 12.5
	<b>Remarks:</b>	Surplus excavated Material to be used at site. Hence Separate cost for disposal not added.		
24.9	2410	<p><b>Laying Paving Fabric Beneath a Pavement Overlay</b>                      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.                      Unit = sqm (For 2800 sqm)</p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Paving Fabric                      Paving Bitumen</p> <p><b>c) Equipment</b>                      Road sweeper                      Pneumatic roller                      Bitumen pressure distributor</p>	day day sqm tonne hour hour hour	1 30 2940 2.8 6 6 6
24.10	2400	<p><b>Laying Boulder Apron in Crates of Synthetic Geogrids</b>                      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.                      Unit = cum (For 3.0 cum)</p> <p><b>a) Labour</b>                      skilled                      Unskilled</p> <p><b>b) Material</b>                      Geo grids                      Connectors/ Staples                      Polymer braids                      Stones with minimum size of 200 mm                      Stones spall for filling voids</p>	day day sqm nos. meter cum cum	1 2 21 50 20 3.45 0.45

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
24.11	(i)  A	2405, 2406, 2407	<b>Reinforced Earth Structures</b>		
			<p><b>Assembling, joining and laying of reinforcing elements.</b></p> <p><b>Providing, laying and joining reinforcing elements With reinforcing element of steel / Aluminum strips / polymeric strips.</b> Unit = meter (For 450 m)</p> <p><b>a) Labour</b> Unskilled day 9 Skilled day 3</p> <p><b>b) Material</b> @ 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>		
		<b>Remarks:</b>	Any one of the above alternative may be adopted as per approved design.		
	B		<p><b>Providing, laying and joining reinforcing elements with reinforcing elements of synthetic Geogrids</b> Unit = sqm (For 300 sqm)</p> <p><b>a) Labour</b> Unskilled day 9 Skilled day 4</p> <p><b>b) Material</b> 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
24.12	(ii)	<b>Providing and laying Facing elements of RCC</b> <b>Unit = sqm (For 75 sqm)</b> <b>a) Labour</b> Unskilled Skilled <b>b) Equipment</b> Crane <b>c) Material</b> 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
	A	<b>Remarks:</b> 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. 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. 4. The compacted earth filling to be retained shall form part of embankment. 5. Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.		
	2411	<b>Providing and Installation of soil nailing with semi-flexible 3-D galvanized steel mat for slope protection and erosion control</b> <b>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)</b> <b>Unit = sqm (For 40 sqm)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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

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
	<b>Remarks:</b>	* 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>B 1</b>	<b>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</b>		
	<b>i</b>	<b>In shallow slopes (&lt; 45 degrees slope angle)</b> <b>Unit = sqm (For 150 sqm)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Angular gravel 32-63 mm <b>c) Equipment</b> Dredger crane, loader (0.25-0.5 m <sup>3</sup> ) or bucket conveyer belt	day day cum hour	1 1 7.5 6
	<b>ii</b>	<b>In slopes (&gt;45 degrees slope angle)</b> <b>Unit = sqm (For 120 sqm)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Angular gravel 32-63 mm <b>c) Equipment</b> Dredger crane,/ loader	day day cum hour	1 1 6 6
	<b>B 2</b>	<b>OR</b> <b>Filling the installed 3-D galvanized steel profile with gravel size 32-63 mm, manually</b>		
	<b>i</b>	<b>In shallow slopes (&lt; 45 degrees slope angle)</b> <b>Unit = sqm (For 150 sqm)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Angular gravel 32-63 mm	day day cum	2 6 7.5
	<b>ii</b>	<b>In slopes (&gt;45 degrees slope angle)</b> <b>Unit = sqm (For 120 sqm)</b> <b>a) Labour</b> Skilled	day	2

NORMS FOR RATE ANALYSIS

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

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	<b>D</b>	<b>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.</b>		
	<b>i</b>	<b>Driving T-nails in soft soil using small dia. pre-bored holes without using cement mortar</b>		
	<b>p</b>	<b>For flat surface and shallow slopes &lt; 45°</b> <b>Unit = meter (For 100 m.)</b> <b>Taking output = 100 meter</b>		
		<b>a) Labour</b>		
		Skilled	day	3
		Unskilled	day	3
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		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
	<b>Remarks:</b>	for other size of nail ( 30 mm or 35 mm ) use different value of nail cost.		
	<b>q</b>	<b>In slopes (&gt;45 degrees slope angle)</b> <b>Unit = meter (For 100 m.)</b>		
		<b>a) Labour</b>		
		Skilled	day	4
		Unskilled	day	4
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		



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
	<b>Remarks:</b>	for other size of nail ( 30 mm or 35 mm ) use different value of nail cost.		
	<b>ii</b>	<b>Driving T-nails in rocky soil using bigger dia. pre-bored holes using cement mortar</b>		
	<b>p</b>	<b>For flat surface and shallow slopes &lt; 45°</b> <b>Unit = meter (For 100 m.)</b>		
		<b>a) Labour</b>		
		Skilled	day	6
		Unskilled	day	6
		<b>b) Material</b>		
		Galvanized T-steel profile 25 x 25 x 3 mm	kg	129
		40 X 40 X 5 mm	kg	326
		Cement	kg	250
		<b>c) Equipment</b>		
		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
	<b>q</b>	<b>In slopes (&gt;45 degrees slope angle)</b> <b>Unit = meter (For 100 m.)</b>		
		<b>a) Labour</b>		
		Skilled	day	6
		Unskilled	day	6
		<b>b) Material</b>		
		Galvanized T-steel profile 25 x 25 x 3 mm	kg	129
		40 X 40 X 5 mm	kg	326
		Cement	kg	250
		<b>c) Equipment</b>		
		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	<b>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</b> <b>On soft soils</b> <b>Unit = meter (For 100 m.)</b>		
		<b>a) Labour</b>		
		Skilled	day	4
		Unskilled	day	4
		<b>b) Material</b>		
		28 mm dia GEWI-steel bar	kg	483
	Cement	kg	800	
	<b>c) Equipment</b>			
	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	<b>On rocky soils (4-8 m)</b> <b>Unit = meter (For 100 m.)</b>		
<b>a) Material</b>				
28 mm dia GEWI-steel bar		kg	483	
Cement		kg	600	
<b>b) Labour</b>				
Skilled		day	5	
Unskilled	day	5		
<b>c) Equipment</b>				
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	<b>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 &gt;8 m on slopes</b> <b>On soft soils</b> <b>Unit = meter (For 100 m.)</b>			
	<b>a) Labour</b>			
	Skilled	day	6	
Unskilled	day	6		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			<b>b) Material</b> 28 mm dia GEWI-steel bar Cement	kg kg	483 800
			<b>c) Equipment</b> 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
	ii		<b>On rocky soils</b> <b>Unit = meter (For 100 m.)</b>		
			<b>a) Labour</b> Skilled Unskilled	day day	8 8
			<b>b) Material</b> 28 mm dia GEWI-steel bar Cement	kg kg	483 600
			<b>c) Equipment</b> 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
			OR excavator mounted Boring Lafitte (horizontal drilling machine)	hour	24
24.13		2416	<b>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.</b> <b>Manual Means</b> <b>Unit = cum (For 1 cum)</b>		
	A		<b>a) Labour</b> Skilled Unskilled	day day	1 3
			<b>b) Material</b> Stone Stone Spalls	cum cum	1 0.2
	B		<b>Mechanical means</b> <b>Unit = cum (For 100 cum)</b>		
			<b>a) Labour</b>		

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>b) Material</b>		
		Stone weighing not less than 40 kg	cum	100
		Stone spalls of minimum 25 mm size	cum	20
		<b>c) Equipment</b>		
		Hydraulic excavator	hour	6
		<b>Mechanical means for Bigger boulder</b>		
		<b>Unit = cum (For 100 cum)</b>		
		<b>a) Labour</b>		
		Skilled	day	2
		Unskilled	day	6
		<b>b) Material</b>		
		Stone weighing not less than 200 kg	cum	100
Stone spalls	cum	20		
<b>c) Equipment</b>				
Crane 15 t capacity	hour	12		
24.14	A	<b>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 .</b>		
		<b>Unit = cum (For 1 cum)</b>		
		<b>Manual means</b>		
		<b>a) Labour</b>		
		Skilled	day	1
		Unskilled	day	3
		<b>b) Material</b>		
		Concrete Grade M 15	cum	1.1
		<b>B</b>		
		<b>Mechanical means</b>		
		<b>Unit = cum (For 100 cum)</b>		
		<b>a) Labour</b>		
		Skilled	day	2
		Unskilled	day	4
<b>b) Material</b>				
Concrete Grade M 15	cum	110		
<b>c) Equipment</b>				
Hydraulic excavator	hour	6		
<b>Remarks:</b>		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 <b>Stone/Boulder</b> Unit = cum (For 1 cum) a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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 <b>Manual Means</b> Unit = cum (For 1 cum) a) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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) <b>Labour</b> Skilled Unskilled b) <b>Material</b> Graded stone aggregate of required size	day day cum	1 3 1.2
		<b>Remarks:</b>	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) <b>Labour</b> Skilled Unskilled b) <b>Material</b> 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	<b>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.</b>  <b>Without using Mechanical aid</b> <b>Unit = meter (For 10 m.)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Dowel Bar 20 mm dia or as specified Grouting Materials Grouting material	day	2
				day	15
	B		<b>Using Mechanical Aid</b> <b>Unit = meter (For 40 m.)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Dowel Bar 20 mm dia or as specified Grouting Materials Grouting material <b>c) Equipment</b> Air Compressor with jack hammer/ Portable rock driller	meter	11
				10 % of Dowel bar	
		<b>Remarks:</b>	For other size of Dowel bar rate will be derived on the basis of per meter weight of bar.		
24.19		2413	<b>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</b>  <b>Unit = meter (For 10 m.)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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	<b>c) Equipment</b> 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
			<b>Providing and laying HDPE pipes with perforations including joining series II, HDPE pipe 250 mm dia</b> <b>Unit = meter (For 100 m.)</b> <b>a) Labour</b> Semi Skilled Skilled Unskilled <b>b) Material</b> HDPE pipes 250 mm <b>c) Equipment</b> 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		<b>series II, HDPE pipe 160 mm dia</b> <b>Unit = meter</b> <b>a) Labour</b> Semi Skilled Skilled Unskilled <b>b) Material</b> HDPE pipe <b>c) Equipment</b> 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>Remarks:</b>		
24.21	A I	2421	<b>Providing and laying Plum concrete ( Boulder mixed concrete) as per Drawing and Specifications</b> <b>60% M 15 concrete and 40% boulders/stones</b> <b>using Mechanical Aids</b> <b>Unit = cum (For 10 cum)</b> <b>a) Labour</b> Skilled	day	3

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	30
			<b>b) Material</b>		
			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
			<b>c) Equipment</b>		
			concrete mixer	hour	6
			concrete vibrator	hour	6
	<b>II</b>		<b>Manual means</b>		
			<b>Unit = cum (For 1 cum)</b>		
			<b>a) Labour</b>		
			Skilled	day	1
			Unskilled	day	4
			<b>b) Material</b>		
			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>B</b>		<b>70% M 15 concrete and 30% boulders/stones</b>		
	<b>I</b>		<b>Using Mechanical Aids</b>		
			<b>Unit = cum (For 10 cum)</b>		
			<b>a) Labour</b>		
			Skilled	day	4
			Unskilled	day	30
			<b>b) Material</b>		
			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
			<b>c) Equipment</b>		
			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	<b>Manual means</b>		
		<b>a) Labour</b>		
		Skilled	day	1
		Unskilled	day	4
		<b>b) Material</b>		
		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	<b>Sub-Surface Drains with Perforated Pipe</b>		
		<b>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.</b>		
		<b>Unit = meter (For 10 m.)</b>		
		<b>a) Labour</b>		
		Skilled	day	1
		Unskilled	day	3
		<b>b) Material</b>		
		Perforated pipe of cement concrete, internal dia 100 mm	meter	11
		Crushed stone as per specification	cum	2.4
		<b>Remarks:</b>		
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	<b>Aggregate Sub-Surface Drains</b>		
		<b>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.</b>		
		<b>Unit = meter (For 10 m.)</b>		
		<b>a) Labour</b>		
Skilled	day	1		
Unskilled	day	3		
<b>b) Material</b>				
Crushed stone	cum	1.35		
24.24	2414	<b>Underground Drain at Edge of Pavement</b>		

NORMS FOR RATE ANALYSIS

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>
	<b>Remarks:</b>	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	A	2500	<b>Providing and laying Brick Masonry Work in Cement mortar in Foundation / structure complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>		
			<i>Unit = cum (For 5 cum)</i>		
			<b>Cement sand mortar (1:2)</b>		
			<b>a) Labour</b>		
			Skilled	day	6.00
			Unskilled	day	12.00
			<b>b) Material</b>		
			Bricks Ist class	nos	2800.00
			Cement	tonne	0.80
			Sand	cum	1.12
			Cost of water	KL	0.10
			<b>B</b>		
			<b>Cement sand mortar (1:3)</b>		
			<b>a) Labour</b>		
			Skilled	day	6.00
			Unskilled	day	12.00
<b>b) Material</b>					
Bricks Ist class	nos	2800.00			
Cement	tonne	0.61			
Sand	cum	1.26			
Cost of water	KL	0.10			
<b>C</b>					
<b>Cement sand mortar (1:4)</b>					
<b>a) Labour</b>					
Skilled	day	6.00			
Unskilled	day	12.00			
<b>b) Material</b>					
Bricks Ist class	nos	2800.00			
Cement	tonne	0.48			
Sand	cum	1.35			
Cost of water	KL	0.10			
<b>D</b>					
<b>Cement sand mortar (1:6)</b>					
<b>a) Labour</b>					
Skilled	day	6.00			
Unskilled	day	12.00			
<b>b) Material</b>					
Bricks Ist class	nos	2800.00			
Cement	tonne	0.35			
Sand	cum	1.45			
Cost of water	KL	0.10			
<b>Remarks:</b>			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	<b>Providing and laying Brick masonry work in superstructure/ sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications</b>		
			<b>Cement Mortar 1:2 (1 cement : 2 sand)</b>		
			<i>Unit = cum (for 5 cum)</i>		
			<b>a) Labour</b>		
			Skilled	day	6.00
			Unskilled	day	12.00
			<b>b) Material</b>		
			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	<b>Cement Mortar 1:3 (1 cement : 3 sand)</b>		
			<i>Unit = cum (For 5 cum)</i>		
			<b>b) Labour</b>		
			Skilled	day	7.00
			Unskilled	day	14.00
			<b>b) Material</b>		
			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	<b>Cement Mortar 1:4 (1 cement : 4 sand)</b>			
		<i>Unit = cum (For 5 cum)</i>			
		<b>a) Labour</b>			
		Skilled	day	7.00	
		Unskilled	day	14.00	
		<b>b) Material</b>			
		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	<b>Cement Mortar 1:6 (1 cement : 6 sand)</b>			
		<i>Unit = cum(For 5 cum)</i>			
		<b>a) Labour</b>			
		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>b) Material</b> 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	<b>Providing, and applying Pointing with cement mortar (1:3) on brick work in structure as per Technical Specifications .</b> <i>Unit = sqm (For 100 sqm)</i>		
	Remarks:	Scaffolding is already included in previous items of brick works		
25.4		<b>Providing and applying 12.5 mm thick Plaster with cement mortar on brick work structure as per Technical Specifications</b>		
	A	<b>Cement Mortar 1:2 (1 cement : 2 sand)</b> <i>Unit = sqm (For 10 sqm)</i>		
		<b>a) Labour</b> Skilled Unskilled	day day	10.00 12.00
		<b>b) Material</b> Cement Sand Cost of water	tonne cum KL	0.15 0.32 1.00
	B	<b>Cement Mortar 1:3 (1 cement : 3 sand)</b> <i>Unit = sqm (For 10 sqm)</i>		
		<b>a) Labour</b> Skilled Unskilled	day day	10.00 12.00
		<b>b) Material</b> Cement Sand Cost of water	tonne cum KL	0.72 1.50 0.20
	C	<b>Cement Mortar 1:4 (1 cement : 4 sand)</b>		

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><b>a) Labour</b></p> <p>Skilled</p> <p>Unskilled</p> <p><b>b) Material</b></p> <p>Cement</p> <p>Sand</p> <p>Cost of water</p>	<p>day</p> <p>day</p> <p>tonne</p> <p>cum</p> <p>KL</p>	<p>10.00</p> <p>12.00</p> <p>0.58</p> <p>1.60</p> <p>0.17</p>
		<p><b>Remarks:</b></p> <p>1. Scaffolding is already included in brick works</p> <p>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.</p> <p>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><b>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.</b></p> <p><i>Unit = meter (For 30 m.)</i></p> <p><b>a) Labour</b></p> <p>Skilled</p> <p>Unskilled</p> <p><b>b) Material</b></p> <p>AC pipe 100 mm dia. (including wastage @ 5 per cent )</p> <p>Average length of weep hole is taken as one meter for the purpose of estimating.</p> <p>MS clamp</p> <p>collar for AC pipe (average) taking 10% of above pipe rate</p> <p>Cement</p> <p>Sand</p>	<p>day</p> <p>day</p> <p>meter</p> <p>nos</p> <p>nos</p> <p>tonne</p> <p>cum</p>	<p>1.00</p> <p>1.00</p> <p>31.50</p> <p>30.00</p> <p>10.00</p> <p>0.02</p> <p>0.06</p>
		<p><b>Remarks:</b></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.</p> <p>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	<b>Providing and laying of dry Stone Masonry Work as per Drawing and Technical Specifications.</b> <i>Unit = cum (For 5 cum)</i>		
		<b>a) Labour</b> Skilled	day	4.00
		Unskilled	day	8.00
26.2	2602, 2603,2608	<b>Providing and laying of Random rubble stone Masonry in mud Mortar as per Drawing and Technical Specifications.</b> <i>Unit = cum (For 5 cum)</i>		
		<b>a) Labour</b> Skilled	day	6.00
		Unskilled	day	12.00
		<b>b) Material</b> Stone	cum	5.75
		Mud ( clay)	cum	2.00
26.3	2602, 2603,2607 A	<b>Random Rubble Masonry</b>		
		<b>Providing and laying of Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications.</b> <i>Unit = cum (For 5 cum)</i>		
		<b>a) Labour</b> Skilled	day	7.00
		Unskilled	day	14.00
		<b>b) Material</b> Stone	cum	5.75
		Cement	tonne	0.79
		Sand	cum	1.63
		Cost of water	KL	1.00
		<b>c) Equipment</b> Concrete mixer or other tools 5 % of Labour cost		
		B		<b>Providing and laying of Stone Masonry Work in Cement Mortar 1:4 in Foundation complete as per Drawing and Technical Specifications.</b> <i>Unit = cum (For 5 cum)</i>
<b>a) Labour</b> Skilled	day			7.00
Unskilled	day			14.00
<b>a) Material</b> Stone	cum			5.75

NORMS FOR RATE ANALYSIS

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
			<b>c) Equipment</b>		
			Concrete mixer or other tools 5 % of Labour cost		
			<b>Providing and laying of Stone Masonry Work in Cement Mortar 1:6 in Foundation complete as per Drawing and Technical Specifications.</b>		
			<b>Unit = cum (For 5 cum)</b>		
			<b>a) Labour</b>		
			Skilled	day	7.00
			Unskilled	day	14.00
			<b>b) Material</b>		
			Stone	cum	5.75
			Cement	tonne	0.45
			Sand	cum	2.08
			Cost of water	KL	1.00
			<b>Remarks:</b>		
			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.		
			<b>Providing and laying Stone Masonry work in cement mortar 1:3 in structure complete as per drawing and Technical Specifications</b>		
		2600	<b>Random Rubble Masonry</b>		
			<b>Unit = cum (For 5 cum)</b>		
			<b>a) Labour</b>		
			Skilled	day	7.00
			Unskilled	day	20.00
			<b>b) Material</b>		
			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>Coursed rubble Masonry (first sort )</b>		
			<b>Unit = cum (For 5 cum)</b>		
			<b>a) Labour</b>		
			Skilled	day	8.00
			Unskilled	day	22.00
			<b>b) Material</b>		
			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				
			<b>Remarks:</b>	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.			
			<b>2607</b>	<b>Providing and laying Stone Masonry work in cement mortar 1:4 in structure complete as per Drawing and Technical Specifications</b>			
			<b>Random Rubble Masonry</b> ( coursed/uncoursed ) <b>Unit = cum (For 5 cum)</b>				
			<b>a) Labour</b>				
			Skilled	day	7.00		
			Unskilled	day	20.00		
			<b>b) Material</b>				
			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	<b>Coursed rubble Masonry (first sort )</b> <b>Unit = cum (For 5 cum)</b>				
			<b>a) Labour</b>				
			Skilled	day	8.00		
			Unskilled	day	22.00		
			<b>b) Material</b>				
			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	<b>Providing and lying Stone Masonry work in cement mortar 1:6 in structure complete as per Drawing and Technical Specifications</b>				
			<b>2607</b>	<b>Random Rubble Masonry</b> ( coursed/uncoursed ) <b>Unit = cum (For 5 cum)</b>			
			<b>a) Labour</b>				
			Skilled	day	7.00		
			Unskilled	day	20.00		
			<b>b) Material</b>				
			Stone	cum	5.75		
			Cement	tonne	0.48		
			<b>Remarks:</b>	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 26.5.			

NORMS FOR RATE ANALYSIS

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>B</b>	<b>2606</b>	<b>Coursed rubble Masonry (first sort )</b> <i>Unit = cum (For 5 cum)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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
		<b>Remarks:</b>	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	<b>A</b>	<b>2600</b>	<b>Providing and Pointing with cement mortar on masonry work in structure as per Technical Specifications cement mortar (1:3 )</b> <i>Unit = sqm (For 100 sqm)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Cement Sand Cost of water	day day tonne cum KL	9.00 9.00 0.31 0.63 0.05
	<b>B</b>		<b>cement mortar (1:2 )</b> <i>Unit = sqm (For 100 sqm)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Cement Sand Cost of water	day day tonne cum KL	9.00 9.00 0.40 0.56 0.07
	<b>C</b>		<b>Cement mortar (1:1 )</b> <i>Unit = sqm (For 100 sqm)</i>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      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>
	<b>Remarks:</b>	<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	<b>Removal of existing cement concrete wearing coat including its disposal complete</b>		
			<b>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</b>		
			<b>Unit = Sqm ( For 75 mm thick, 100 sqm)</b>		
			<b>a) Labour</b>		
			Skilled	day	1.00
			Unskilled	day	12.00
	<b>b) Equipment</b>				
	Tractor-trolley.	hour	6.00		
	Drilling machine with bit and accessories	hour	6.00		
	B	2712	<b>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</b>		
			<b>Unit = cum ( For 10 cum)</b>		
			<b>a) Labour</b>		
Skilled			day	6.00	
Unskilled			day	60.00	
<b>b) Equipment</b>					
Tractor-trolley.	hour	36.00			
Drilling machine with bit and accessories	hour	36.00			
C	2712	<b>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.</b>			
		<b>Unit = Sqm ( For 10 sqm)</b>			
		<b>a) Labour</b>			
		Skilled	day	1.00	
		Unskilled	day	10.00	
		<b>b) Equipment</b>			
Drilling machine with bit and accessories	hour	6.00			
Tractor-trolley.	hour	6.00			
27.2		2710	<b>Providing and application of gunite/shortcrete to repare 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 .</b>		
			<b>Unit = Sqm ( For 50 sqm)</b>		
			<b>a) Labour</b>		
			Skilled	day	2.00
			Unskilled	day	20.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.3	A	2710	<b>b) Material</b> 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
			<b>c) Equipment</b> Air Compressor Shotcreteing equipment Concrifete mixture	hour hour hour	6.00 6.00 6.00
	B		<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.</b> <b>Mix 1:3 ( Cement and Coarse sand)</b> <b>Unit = Sqm ( For 30 sqm)</b>		
			<b>a) Labour</b> Skilled <i>Unskilled</i>	day day	2.00 6.00
			<b>b) Material</b> 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
			<b>c) Equipment</b> Compressor with Guniting equipment along with accessories  Shotcreteing equipment	hour  hour	6.00  6.00
			<b>Mix 1:1:2 ( Cement :sand: aggregate)</b> <b>Unit = Sqm ( for 30 sqm, 40 mm thickness)</b>		
			<b>a) Labour</b> Skilled Unskilled	day day	2.00 6.00
			<b>b) Material</b> 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
			<b>c) Equipment</b> Compressor with Guniting equipment along with accessories  Shotcreteing equipment	hour  hour	6.00  6.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.4		2709	<p><b>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</b>  <b>Unit= nos. ( For 1 Number)</b></p> <p><b>a) Labour</b>                      Skilled                      Unskilled                      Add 10 per cent of Labour cost for drilling holes etc.</p> <p><b>b) Material</b>                      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><b>Providing and Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical Specification.</b>  <b>Cement Grout</b>  <b>Unit = kg ( For 50 kg)</b></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Cement                      Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement</p> <p><b>c) Equipment</b>                      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><b>Cement Mortar (1:1) Grouting</b>  <b>Unit = kg ( For 50 kg)</b></p> <p><b>b) Labour</b>                      Skilled                      Unskilled</p> <p><b>a) Material</b>                      Cement                      Sand                      Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement</p> <p><b>c) Equipment</b>                      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><b>Low viscosity epoxy injection resin</b>  <b>Unit = Lit ( For 50 liter)</b></p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
27.6	A	2700	<b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Low viscosity Injection Epoxy Grout Epoxy primer Joint Sealant Compound ( Epoxy Adhesive) <b>c) Equipment</b> 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
			<b>Patching of damaged concrete surface with polymer concrete/ micro concrete and curing compounds</b> <b>Providing and applying polymer concrete and curing compounds on damaged concrete surface as per instructions of manufacturer and approval of the Engineer.</b> <b>Unit = sqm ( for 10 sqm of 35 mm thick)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter <b>c) Equipment</b> Grout pump with agitator and accessories Generator	day day kg hour hour	1.00 3.00 770.00 6.00 6.00
<b>Remarks:</b>			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		<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 &amp; above)With adding 20% local aggregates of 10 mm down) as per instructions of manufacturer and approval of the Engineer.</b> <b>Unit = cum (For 1 cum)</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> 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

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.7	C 2706	Cost of water	KL	1.00
		<b>c) Equipment</b>		
		Concrete mixer	hour	1.00
		Generator	hour	1.00
		<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 &amp; above) as per instructions of manufacturer and approval of the Engineer. Unit = cum (For 1 cum)</b>		
		<b>a) Labour</b>		
		Skilled	day	12.00
		Unskilled	day	18.00
		<b>b) Material</b>		
		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
		<b>c) Equipment</b>		
		Concrete mixer	hour	6.00
Generator	hour	6.00		
27.8	2707	<b>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. Unit = kg ( for 10 kg)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	2.00
		<b>b) Material</b>		
		Epoxy Adhesive	kg	11.00
		<b>c) Equipment</b>		
Epoxy Injection gun	hour	6.00		
Generator	hour	6.00		
27.8	2707	<b>Providing and Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification Unit = sqm ( for 100 sqm, 10 mm thick epoxy)</b>		
		<b>a) Labour</b>		
		Skilled	day	5.00
		Unskilled	day	8.00
		<b>b) Material</b>		
		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		



NORMS FOR RATE ANALYSIS

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.		
		<b>c) Equipment</b>		
		Air Compressor	hour	6.00
		Mortar mixer	hour	6.00
		<b>Remarks:</b>		
		In case of thickness more than 10 mm adjust rate as per thickness of mortar.		
27.9	2710	<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	0.10
		Unskilled	day	0.10
		<b>b) Material</b>		
		Thixotropic repair mortar ( Sprayable)	kg	850.00
		Epoxy bonding agent	kg	8.70
		<b>c) Equipment</b>		
		Air compressor	hour	1.00
		Shotcreteing equipment	hour	1.00
		Generator	hour	6.00
27.10	2700	<b>Providing and applying pre-packed cement based polymer mortar for replacement of spalled concrete Unit = sqm ( For 10 sqm, 25 mm thick)</b>		
		<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	2.00
		<b>b) Material</b>		
		Epoxy bonding agent	kg	8.70
		polymer mortar M-45	kg	550.00
		<b>c) Equipment</b>		
		Compressor	hour	6.00
		<b>Remarks:</b>		
		In case of thickness other than 10 mm adjust rate as per thickness of mortar.		
27.11	2708	<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.12	2711	<b>b) Material</b> Epoxy resin	kg	8.40
		<b>Providing and replacement of Bearings complete as per Technical Specification and direction of the Engineer.</b> <i>Unit = nos. ( For 3 no, span upto 30 m)</i>		
27.13	2711	<b>a) Labour</b> Skilled Unskilled	day day	5.00 12.00
		<b>b) Material</b> Bearing of required type and capacity Wooden packing	no cum	3.00 0.15
27.13	2711	<b>c) Equipment</b> Hydraulic Jack ( 40 tonne capacity)	hour	72.00
		<b>Providing required parts and rectification of Bearings as per Technical Specifications and direction of the Engineer.</b> <i>Unit = nos ( for 3 no of bearing)</i>		
		<b>Remarks:</b> 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.		
		<b>Remarks:</b> 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.		
		<b>a) Labour</b> Skilled Unskilled	day day	5.00 12.00
		<b>b) Material</b> Parts of Bearing of required type and capacity Wooden packing	As per requirement cum	0.15
		<b>c) Equipment</b> 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><b>Providing and replacement of Expansion Joints complete as per drawings, Technical specifications and direction of the Engineer.</b>  <i>Unit = meter ( for 12 meter)</i></p> <p><b>a) Labour</b>                      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>b) Material</b>                      Epoxy @ 0.8 kg/sqm kg 9.6 *                      Concrete ( select as per requirement) cum 2.4 *                      additional reinforcement kg 100*</p> <p><b>C) Replacement of joint</b>                      expansion joint ( Elastomeric Slab Steel Expansion Joint / compression seal/ strip / modular strip. etc.) meter 12.00</p>		
		<p><b>Remarks:</b></p> <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><b>Providing and replacement of Damaged Concrete Railing as per Drawing, Technical Specifications and direction of the Engineer,.</b>  <i>Unit = meter ( For 30 meter)</i></p> <p><b>a) Labour</b>                      Labour for dismantling old railing and disposal of dismantled material.                      Skilled day 1.00                      Unskilled day 12.00</p> <p><b>b) Equipment</b>                      Tractor-trolley for disposal of dismantled material hour 6.00</p>		
		<p><b>Remarks:</b></p> <p>The rate for the provision of new railing may be adopted from the chapter on superstructure.</p>		
27.16	2700	<p><b>Providing and replacement of Crash Barrier as per Drawing, Technical Specifications and instruction of the Engineer.</b>  <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	<b>a) Labour</b> Labour for dismantling old railing and disposal of dismantled material. Skilled Unskilled	day day	1.00 20.00
		<b>b) Equipment</b> Tractor-trolley	hour	6.00
<b>Remarks:</b>		The rate for the construction of new crash barrier shall be adopted from Section 1500.		
27.17	2700	<b>Providing and replacement of Damaged mild steel railing as per Drawing, Technical Specifications and direction of the Engineer.</b> <i>Unit = meter ( For 30 meter)</i>		
		<b>a) Labour</b> Labour for dismantling old railing and disposal of dismantled material. Skilled Unskilled	day day	1.00 12.00
27.17	2700	<b>b) Equipment</b> Tractor-trolley	hour	5.00
		<b>Remarks:</b> The rate for the construction of new mild steel railing shall be adopted from Section 31.		
27.18	2700	<b>Repair of Crash Barrier</b> <b>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.</b> <i>Unit = meter ( For 30 meter)</i>		
		<b>a) Labour</b> Skilled Unskilled	day day	1.00 3.00
27.18	2700	<b>b) Material</b> M-30 grade cement concrete	cum	1.00
		<b>Remarks:</b> 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	<b>Repair of RCC Railing</b> <b>Providing and repair of RCC railing to bring it to the original shape as per Drawing, Technical Specifications and instruction of the Engineer.</b> <i>Unit = meter ( For 30 meter)</i>		
		<b>a) Labour</b> Skilled	day	1.00

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		Unskilled	day	2.00
		<b>b) Material</b>		
		M-30 grade cement concrete	cum	0.30
		<b>HYSD bar reinforcement</b>	tonne	0.03
		<b>Remarks:</b>		
27.20	2700	<p><b>Repair of Steel Railing</b></p> <p><b>Providing and repair of steel railing to bring it to the original shape as per Drawing, Technical Specifications and direction of the Engineer.</b></p> <p><i>Unit = meter ( For 30 meter)</i></p> <p><b>a) Labour</b></p> <p>Skilled</p> <p>Unskilled</p> <p><b>b) Material</b></p> <p>Mild steel ISMC series</p> <p>Flat iron</p> <p>MS Bolt and nuts</p> <p>Add 5 per cent of cost of material for painting.</p>	<p>day</p> <p>day</p> <p>kg</p> <p>kg</p> <p>kg</p>	<p>1.00</p> <p>2.00</p> <p>87.00</p> <p>30.00</p> <p>30.00</p>
		<b>Remarks:</b>		
27.21	2713	<p><b>Painting of Steel Bridge</b></p> <p><b>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.</b></p> <p><i>Unit = sqm ( for 20 sqm)</i></p> <p><b>a) Labour</b></p> <p>Skilled</p> <p>Unskilled</p> <p><b>b) Material</b></p> <p>sand ( 1.7 mm - 600 micron)</p> <p><b>c) Equipment</b></p> <p>Air compressor</p> <p>Blasting Machine</p>	<p>day</p> <p>day</p> <p>cum</p> <p>hour</p> <p>hour</p>	<p>1.00</p> <p>7.00</p> <p>0.80</p> <p>6.00</p> <p>6.00</p>
27.22	2713	<p><b>Providing and Painting of steel bridges with one coat of primer, one coat of epoxy and 2 coats of acrylic polyurethane as per specification.</b></p> <p><i>Unit = sqm ( for 20 sqm)</i></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><b>a) Labour</b>                      Skilled ( 0.25+0.25+0.25 =1)                      Unskilled (1+1+1+1=4)</p> <p><b>b) Material</b>                      i) Epoxy Red Zinc Oxide Phosphate Primer                      ii) 2 Pack high built epoxy                      iii) 2 Pack high built polyur - ethane ( 2 coat)</p> <p><b>c) Equipment</b>                      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
	<b>Remarks</b>			
27.23	2713	<p><b>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</b>  <i>Unit = sqm ( for 1 sqm)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      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><b>Repair of Joint Grooves with Epoxy Mortar</b>  <b>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.</b>  <i>Unit = meter ( for 10 m)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Epoxy primer                      Epoxy compound with accessories for preparing epoxy mortar</p> <p><b>c) Equipment</b>                      Air compressor</p>	day day kg kg hour	1.50 1.50 2.50 10.00 0.10
27.25	2700	<p><b>Repair of old Joints Sealant</b>  <b>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.</b></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>		
			<b>a) Labour</b>		
			Skilled	day	0.15
			Unskilled	day	1.50
			<b>b) Material</b>		
			Primer	kg	0.25
			Sealant	kg	1.00
			<b>c) Equipment</b>		
			Air compressor	hour	0.10
			<b>Concrete Jacketing</b>		
			<b>Preparation, hacking and cleaning of existing surface for concrete jacketing as per direction of the Engineer.</b>		
			<i>Unit = sqm ( For 100 sqm)</i>		
			<b>a) Labour</b>		
			Skilled	day	3.00
			Unskilled	day	30.00
<b>b) Equipment</b>					
Hacking Machine	hour	6.00			
Generator	hour	6.00			
<b>B</b>					
<b>Drilling Holes on existing concrete surface of 16 mm diameter and 300 mm depth</b>					
Unit = nos. ( for 100 number)					
<b>a) Labour</b>					
Skilled	day	1.00			
<b>b) Equipment</b>					
Jack hammer /Rock drill	hour	6.00			
Generator	hour	6.00			
<b>Remarks</b>					
		For other size ( diameter and depth) of holes adjust rate as per volume basis.			
<b>C</b>					
<b>Providing and fixing Anchor bar</b>					
Unit = kg					
Refer Rate analysis of Reinforcement					
<b>D</b>					
<b>Providing and Filling drill hole with Epoxy Grout</b>					
Refer Rate analysis of Epoxy grout					
<b>E</b>					
<b>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.</b>					
<i>Unit = cum ( For 1 cum)</i>					
<b>a) Labour</b>					
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>b) Material</b>			
		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	
		<b>c) Equipment</b>			
	Concrete mixer	hour	1.00		
	Generator	hour	1.00		
	B	<b>Corrosion Treatment of Rebar's</b>			
		<b>Providing accessories and removal of rust from exposed rebar area as per direction of the Engineer.</b>			
		<i>Unit = sqm ( For 100 sqm)</i>			
		<b>a) Labour</b>			
		Skilled	day	2.00	
		Unskilled	day	30.00	
		Wire brush, chisel, axe etc. , @5 % of Labour cost			
		<b>Providing and Application of Rust Cleaning &amp; passivating agent as per manufacturer' s guidelines and instruction of the Engineer.</b>			
		<i>Unit = sqm ( For 100 sqm)</i>			
		<b>a) Labour</b>			
Skilled	day	1.00			
Unskilled	day	6.00			
<b>b) Material</b>					
Rust clean agent	kg	10.00			
<b>c) Equipment</b>					
Mechanical sprayer , @5 % of Labour cost					
C	<b>Providing and Application of Alkaline, polymeric, elastomeric formulation designed to protect steel from corrosion as per manufacturer' s guidelines and instruction of the Engineer.</b>				
	<i>Unit = sqm ( For 100 sqm)</i>				
	<b>a) Labour</b>				
	Skilled	day	1.00		
	Unskilled	day	6.00		
	<b>b) Material</b>				
	Alkaline, polymeric, elastomeric primer agent	kg	12.50		
Cement	kg	10.00			
<b>c) Equipment</b>					
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><b>Providing and Application of Acrylic Based bond coat for reinforcement as per manufacturer' s guidelines and instruction of the Engineer.</b>  <i>Unit = sqm ( For 100 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled day 2.00                      Unskilled day 8.00</p> <p>b) <b>Material</b>                      Acrylic based bonding agent kg 50.00                      Cement kg 50.00</p> <p>c) <b>Equipment</b>                      Mechanical sprayer @5 % of Labour cost</p>			
	E	<p><b>Providing and Application of Pre-packed polymer modified mortar as per manufacturer' s guidelines and instruction of the Engineer.</b>                      Refer Item no 27.6</p>			
	F	<p><b>Providing and Application of concrete penetrating corrosion inhibitor as per manufacturer' s guidelines and instruction of the Engineer.</b>  <i>Unit = sqm ( For 100 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled day 2.00                      Unskilled day 8.00</p> <p>b) <b>Material</b>                      concrete penetrating corrosion inhibitor kg 25.00</p> <p>c) <b>Equipment</b>                      Mechanical sprayer @5 % of Labour cost</p>			
			<p><b>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.</b>  <i>Unit = sqm ( For 100 sqm)</i></p> <p>a) <b>Labour</b>                      Skilled day 2.00                      Unskilled day 20.00</p> <p>b) <b>Material</b>                      high build micro porous anti carbonation coat kg 50.00</p> <p>c) <b>Equipment</b>                      Mechanical sprayer @5 % of Labour cost</p>		
	27.29	A	<p><b>Fiber Reinforced Polymer works</b>  <b>Providing and Application of Fiber reinforced polymer ( carbon fiber) as per manufacturer' s guidelines and instruction of the Engineer.</b>  <i>Unit = sqm ( For 100 sqm)</i></p> <p>a) <b>Labour</b></p>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
27.30	B	Skilled	day	2.00
		Unskilled	day	8.00
		<b>b) Material</b>		
		Carbon fiber	sqm	110.00
		Epoxy bonding agent	kg	100.00
		<b>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)</b>		
	C	<b>a) Labour</b>		
		Skilled	day	2.00
		Unskilled	day	8.00
		<b>b) Material</b>		
		Carbon laminated sheet	sqm	110.00
		Laminate adhesive agent ( thixotropic)	kg	20.00
2700	<b>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)</b>			
	<b>a) Labour</b>			
	Skilled	day	1.00	
	Unskilled	day	4.00	
	<b>b) Material</b>			
	Two component aliphatic Polyurethane coat	kg	75.00	
27.31	2700	<b>Repair of Gabion wall</b>		
		<b>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)</b>		
		<b>a) Labour</b>		
		Skilled	day	4.00
		Unskilled	day	16.00
		<b>b) Material</b>		
Boulder	cum	12.00		
Binding wire	kg	10.00		
<b>Remarks:</b>		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	<b>Repair of masonry wall / side drain</b> <b>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.</b>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
		<p><i>Unit = cum ( 5 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 10.00                      Unskilled day 20.00</p> <p><b>b) Material</b>                      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><b>Remarks:</b></p>		
27.32	2700	<p><b>Inspection and Re-tightening of Nut bolt and other accessories</b></p> <p><b>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.</b></p> <p><i>Unit = nos ( For 500 nos )</i></p> <p><b>a) Labour</b>                      Skilled day 2.00                      Unskilled day 10.00</p> <p><b>b) Material</b>                      Nut bolt nos (as per requirement)                      Bamboos nos 8.00                      Dori kg 8.00</p> <p><b>c) Equipment</b>                      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><b>Remarks:</b></p>		
		<p><b>Remarks for section 279</b></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	<b>Collection and preparation of seeds</b>		
			<b>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.</b>		
			<i>Unit = Kg (For 1 Kg)</i>		
			<b>a) Labour</b>		
			Unskilled	day	1.50
	<b>b) Material</b>				
	Sealed bag	nos	1.00		
	<b>c) Equipment</b>				
	Add 3 % of Labour cost for Khukuri and other T&P				
	B	2802	<b>Collection of large shrub seeds (e.g. bhujetro from sources within 1 km of the road including seed preparation for storage after drying.</b>		
			<i>Unit = Kg (For 1 Kg)</i>		
			<b>a) Labour</b>		
	Unskilled	day	0.45		
	C	2802	<b>Collection of medium-sized shrub seeds (e.g. Keraukose) from sources within 1 km of the road, including seed preparation for storage after drying.</b>		
			<i>Unit = Kg</i>		
<b>a) Labour</b>					
Unskilled			day	0.75	
<b>b) Material</b>					
Sealed bag	nos	1.00			
D	2802	<b>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.</b>			
		<i>Unit = Kg (For 1 Kg)</i>			
		<b>a) Labour</b>			
		Unskilled	day	0.95	
		<b>b) Material</b>			
Sealed bag	nos	1.00			
<b>c) Equipment</b>					
Add 3 % of Labour cost for Nanglo and other T&P					
E	2802	<b>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.</b>			
		<i>Unit = Kg (For 1 Kg)</i>			
		<b>a) Labour</b>			
Unskilled	day	2.50			
<b>b) Material</b>					

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity			
28.02	A	2803	Sealed bag	nos	1.00			
			<b>c) Equipment</b> Add 3 % of Labour cost for Nanglo and other T&P					
			<b>Collection of grass and hardwood cuttings for vegetative propagation</b> <b>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.</b> <i>Unit = slips ( For 100 slips)</i>					
			<b>a) Labour</b> Unskilled	day	1.50			
			<b>b) Material</b> Adequate supply of appropriate clumps Hessian jute	sqm	5.00			
			<b>c) Equipment</b> Add 3 % of Labour cost for Kodalo and other T&P					
			<b>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.</b> <i>Unit = slips ( For 100 slips)</i>					
			<b>a) Labour</b> Unskilled	day	3.00			
			<b>b) Material</b> Adequate supply of appropriate clumps Hessian jute	sqm	10.00			
			<b>c) Equipment</b> Add 3 % of Labour cost for Kodalo , Khukuri and other T&P					
28.02	B	2803	<b>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.</b> <i>Unit = slips ( For 100 slips)</i>					
			<b>a) Labour</b> Unskilled	day	0.85			
			<b>b) Material</b> Adequate supply of appropriate clumps Hessian jute	sqm	5.00			
			<b>c) Equipment</b> Add 3 % of Labour cost for Khukuri and other T&P					
			28.03	C	2804	<b>Nursery operation and management (bed preparation)</b>		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity
	A	<p><b>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].</b>  <i>Unit = sqm ( For 5 sqm)</i></p> <p><b>a) Labour</b>                      Skilled day 1.50                      Unskilled day 0.85</p> <p><b>b) Material</b>                      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</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for Khanti, Shovel, Pick axe, Screen, mesh and other T&amp;P</p>		
	B	<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.]</b>  <i>Unit = sqm ( For 5 sqm)</i></p> <p><b>a) Labour</b>                      Unskilled day 6.00</p> <p><b>b) Material</b>                      Bamboo poles nos 15.00                      Bricks nos 96.00                      Gravel cum 0.25                      Line String meter 13.00                      Binding wire kg 3.00</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for Khanti, Shovel, Pick axe and other T&amp;P</p>		
	C	<p><b>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.</b>  <i>Unit = sqm ( For 5 sqm)</i></p>		

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.04	D		<p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 1.50</p> <p><b>b) Material</b>                      Gravel cum 0.38                      Forest soil cum 1.46                      Compost cum 0.38                      Washed sand cum 6.00                      Hessian Jute sqm 10.00</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for Shovel, Pick axe and other T&amp;P</p> <p><b>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.</b>  <i>Unit = sqm ( For 5 sqm)</i></p> <p><b>a) Labour</b>                      Skilled day 2.00</p> <p><b>b) Material</b>                      Gravel cum 0.38                      Forest soil cum 1.46                      Compost cum 0.38                      Washed sand cum 6.00                      Hessian Jute sqm 10.00</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for Shovel, Pick axe and other T&amp;P</p>		
	A	2804	<p><b>Nursery operation and management (seed sowing and transplanting; planting hardwood cuttings)</b>  <b>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.</b>  <i>Unit = sqm ( For 5 sqm)</i></p> <p><b>a) Labour</b>                      Unskilled day 0.04</p> <p><b>b) Material</b>                      Seed cum 0.38</p> <p><b>c) Equipment</b>                      Add 3 % of Labour cost for Bowl, Trowel and other T&amp;P</p>		
	B		<p><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]</b>  <i>Unit = nos. (For 1000 nos.)</i></p>		

NORMS FOR RATE ANALYSIS

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



NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
28.05	G	2805	<b>b) Material</b> Hessian Jute	sqm	0.30
			<b>c) Equipment</b> Add 3 % of Labour cost for Khukuri , Shovel and other T&P		
			<b>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.</b> <i>Unit = nos. (For 1000 nos.)</i>		
			<b>a) Labour</b> Unskilled	day	0.60
			<b>b) Material</b> Hard wood cuttings	nos	1000.00
			<b>c) Equipment</b> Add 3 % of Labour cost for Khanti and other T&P		
	A	2805	<b>Preparation of raised Materials for extraction from the nursery</b> <b>Grass culm cutting production from nursery stock: single or double node (e.g. napier)</b> <i>Unit = nos. (For 1000 nos.)</i>		
			<b>a) Labour</b> Unskilled	day	0.70
			<b>b) Material</b> Hessian Jute	sqm	2.70
	B	2805	<b>c) Equipment</b> Add 3 % of Labour cost for Khukuri and other T&P		
			<b>Uprooting and preparing grass slips ready for site planting from nursery seedling.</b> <i>Unit = nos. (For 1000 nos.)</i>		
			<b>a) Labour</b> Unskilled	day	0.63
C	2805	<b>b) Material</b> Hessian Jute	sqm	1.35	
		<b>c) Equipment</b> Add 3 % of Labour cost for Fork, Pick axe Khukuri and other T&P			
		<b>Uprooting and preparing grass slips ready for site planting from nursery grass clumps raised from slips by vegetative propagation.</b> <i>Unit = nos. (For 1000 nos.)</i>			
C	2805	<b>a) Labour</b> Unskilled	day	0.33	
		<b>b) Material</b> Hessian Jute	sqm	4.20	
		<b>c) Equipment</b> 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><b>Compost and mulch production</b></p> <p><b>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.</b>  <i>Unit = cum ( For 1 cum)</i></p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Material</b></p> <p>c) <b>Equipment</b> Add 3 % of Labour cost for Hansia, Doko and other T &amp; P</p>	day	0.12
	B		<p><b>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.</b>  <i>Unit = cum ( For 1 cum)</i></p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Material</b></p> <p>c) <b>Equipment</b> Add 3 % of Labour cost for Hansia, Doko and other T &amp; P</p>	day	0.12
	C		<p><b>Turning compost once per month.</b>  <i>Unit = cum ( For 1 cum)</i></p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Material</b></p> <p>c) <b>Equipment</b> Add 3 % of Labour cost for Shovel and other T &amp; P</p>	day	0.10
28.7	A	2807	<p><b>Direct seedling on site</b></p> <p><b>Broadcasting grass seeds on slopes &lt;40°; seedling rate 25 g per sqm.</b>  <i>Unit = sqm (For 100 sqm )</i></p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Material</b> Seed</p>	day	0.17
	B		<p><b>Broadcasting grass seeds on slopes &lt;40° ;including cover with long mulch, seedling rate 25 g per sqm.</b>  <i>Unit = sqm (For 100 sqm )</i></p> <p>a) <b>Labour</b> Unskilled</p> <p>b) <b>Material</b> 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><b>Broadcasting grass seeds on slopes &lt;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.</b></p> <p><i>Unit = sqm (For 100 sqm )</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Seed Mulch Jute net Live pegs</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Khukuri, Mallet and other T &amp; P</p>	day	6.25
	D		<p><b>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.</b></p> <p><i>Unit = sqm (For 100 sqm )</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Seed</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for MS rod of 50 cm length and other T &amp; P</p>	day	1.00
	A	2807	<p><b>Planting grass on site</b></p> <p><b>Planting single node culm cutting of grass (e.g. napier) on fill slopes&lt;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.</b></p> <p><i>Unit = nos. ( For 100 nos.)</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Grass Cuttings Hessian Jute</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&amp;P</p>	day	0.20
	B		<p><b>Planting single node culm cutting of grass (e.g. napier) on fill slopes&lt;45° Approx. length 15-, including digging planting hole 10- depth using a metal rod or hardwood peg.</b></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><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Grass Cuttings Hessian Jute</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&amp;P</p>	day nos sqm	0.35 100.00 0.27
	C	<p><b>Planting single node culm cutting of grass (e.g. napier) on fill slopes &gt;45° Approx. length 15-, including digging planting hole 10- depth using a metal rod or hardwood peg.</b></p> <p><i>Unit = nos. ( For 100 nos.)</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Grass Cuttings Hessian Jute</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&amp;P</p>	day nos sqm	0.50 100.00 0.27
	D	<p><b>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.</b></p> <p><i>Unit = meter ( For 1 meter)</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Grass slips/ no of drills Cuttings Hessian Jute Line string</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&amp;P</p>	day nos sqm m	0.02 11.00 0.27 1.00
	E	<p><b>Planting rooted grass slips on the slopes &lt;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</b></p> <p><i>Unit = sqm ( For 1 sqm)</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> 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		<b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P			
			<b>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</b> <i>Unit = sqm ( For 1 sqm)</i>			
			<b>a) Labour</b> Unskilled	day	0.30	
			<b>b) Material</b> Grass slips/ no of drills Cuttings	nos	100.00	
			Hessian Jute	sqm	0.27	
			<b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P			
	G			<b>Planting rooted grass slips on the slopes &gt; 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</b> <i>Unit = sqm ( For 1 sqm)</i>		
				<b>a) Labour</b> Unskilled	day	0.40
				<b>b) Material</b> Grass slips/ no of drills Cuttings	nos	100.00
				Hessian Jute	sqm	0.27
				<b>c) Equipment</b> Add 3 % of Labour cost for Ms rod or hard wood peg and other T&P		
				A	2807	
<b>a) Labour</b> Unskilled	day	0.25				
<b>b) Material</b> Seedling	nos	10.00				
Compost	cum	0.05				
Tree guard	nos	10.00				
Green mulch	cum	0.04				
<b>c) Equipment</b> 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><b>Planting containerized tree and shrub seedlings, including pitting, transplanting, composting and mulching, on slopes &lt; 30° Pit size 30 cm diameter x depth mix Compost with soil and back fill into pit to 1/4 of the pit volume</b>  <i>Unit = nos. (For 10 nos.)</i></p> <p><b>a) Labour</b>                      Unskilled</p>	day	0.33
		<p><b>b) Material</b>                      Seedling</p>	nos	10.00
		<p>Compost</p>	cum	0.05
		<p>Green mulch</p>	cum	0.04
		<p><b>c) Equipment</b>                      Add 3 % of Labour cost for Khanti Doko and other T&amp;P</p>		
	C	<p><b>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</b>  <i>Unit = nos. (For 10 nos.)</i></p> <p><b>a) Labour</b>                      Unskilled</p>	day	0.40
		<p><b>b) Material</b>                      Seedling</p>	nos	10.00
		<p>Compost</p>	cum	0.05
		<p>Green mulch</p>	cum	0.04
		<p><b>c) Equipment</b>                      Add 3 % of Labour cost for Khanti Doko and other T&amp;P</p>		
D	<p><b>Planting rooted tree stump cutting and bare root seedlings, including pitting, transplanting, composting and mulching on slopes &lt;30°. Pit size 10 cm diameter x depth. Compost volume 1/4 of volume of the pit mix with original soil.</b>  <i>Unit = nos. (For 10 nos.)</i></p> <p><b>a) Labour</b>                      Unskilled</p>	day	0.17	
	<p><b>b) Material</b>                      Seedling</p>	nos	10.00	
	<p>Compost</p>	cum	0.03	
	<p>Green mulch</p>	cum	0.04	
	<p><b>c) Equipment</b>                      Add 3 % of Labour cost for Khanti Doko and other T&amp;P</p>			

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity	
28.10	E		<b>Planting rooted tree stump cutting and bare root seedlings, including pitting, transplanting, composting and mulching on slopes &lt;math&gt; &lt; 30^{\circ} - 45^{\circ}&lt;/math&gt; Pit size 10 cm diameter x depth. Compost volume 1/4 of volume of the pit mix with original soil.</b> <i>Unit = nos. (For 10 nos)</i>			
			<b>a) Labour</b> Unskilled	day	0.25	
			<b>b) Material</b> Seedling	nos	10.00	
			Compost	cum	0.03	
			Green mulch	cum	0.04	
			<b>c) Equipment</b> Add 3 % of Labour cost for Khanti Doko and other T&P			
	F			<b>Planting rooted tree stump cutting and bare root seedlings, including pitting, transplanting, composting and mulching on slopes &gt; 45° Pit size 10 cm diameter x depth. Compost volume 1/4 of volume of the pit mix with original soil.</b> <i>Unit = nos. (For 10 nos.)</i>		
				<b>a) Labour</b> Unskilled	day	0.33
				<b>b) Material</b> Seedling	nos	10.00
				Compost	cum	0.03
				Green mulch	cum	0.04
				<b>c) Equipment</b> Add 3 % of Labour cost for Khanti Doko and other T&P		
A		2897	<b>Vegetative palisade construction, brush layering and fascines</b> <b>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.</b> <i>Unit = nos. ( For 1000 nos.)</i>			
			<b>a) Labour</b> Unskilled	day	0.85	
B			<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.</b>			

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><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Live peg</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Crowbar and other T&amp;P</p>	day nos	0.17 20.00
	C		<p><b>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.</b></p> <p><i>Unit = meter ( For 1 meter )</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Live peg</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Crowbar and other T&amp;P</p>	day nos	0.12 20.00
	D		<p><b>Site preparation for fascine laying: earth works in excavation of trench to 20 cm depth</b></p> <p><i>Unit = meter ( For 1 meter)</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b></p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Pick Axe, Shovel Crowbar and other T&amp;P</p>	day	0.06
	E		<p><b>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.</b></p> <p><i>Unit = meter ( For 1 meter )</i></p> <p><b>a) Labour</b> Unskilled</p> <p><b>b) Material</b> Hard wood cutting of at least 1 m length</p> <p><b>c) Equipment</b> Add 3 % of Labour cost for Crowbar and other T&amp;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	<b>Jute netting works</b>		
			<b>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</b>		
			<b>Unit = sqm ( For 1 sqm)</b>		
			<b>a) Labour</b> Unskilled	day	0.36
	<b>b) Material</b> Raw Jute	kg	0.25		
	<b>c) Equipment</b> Add 3 % of Labour cost for bamboo 10 no sticks, Khukuri and other T&P				
	B	2808	<b>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.]</b>		
			<b>Unit = sqm (For 1 sqm)</b>		
			<b>a) Labour</b> Unskilled	day	0.15
			<b>b) Material</b> Raw Jute	kg	0.25
	<b>c) Equipment</b> Add 3 % of Labour cost for bamboo 10 no sticks, Khukuri and other T&P				
	C	2808	<b>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.</b>		
<b>Unit = sqm ( For 1 sqm)</b>					
<b>a) Labour</b> Unskilled			day	0.15	
<b>b) Material</b> Woven Jute			sqm	0.25	
Hardwood Cuttings or split bamboo pegs	nos	5.00			
<b>c) Equipment</b> 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) <b>Labour</b> Unskilled	day	0.36		
			b) <b>Material</b> MS rod	m	2.00		
			c) <b>Equipment</b> Add 3 % of Labour cost for Sledge hammer and other T&P				
			<b>Providing and laying of terram paper (geotextile)</b> <i>Unit = meter (For 1 m)</i>				
			a) <b>Labour</b> Unskilled	day	0.36		
			b) <b>Material</b> Terram paper	sqm	1.15		
	A	2810	c) <b>Equipment</b> Add 3 % of Labour cost for Sledge hammer and other T&P				
			<b>Bamboo tree guards</b> <b>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.</b> <i>Unit = meter (For 1 meter)</i>				
			a) <b>Labour</b> Unskilled	day	0.36		
			b) <b>Material</b> Bamboo	meter	2.20		
			c) <b>Equipment</b> Add 3 % of Labour cost for Sledge hammer and other T&P				
			<b>Turfing</b> <b>Grass sodding works including sod cutting , transporting , placing in position and water sprinkling (Lead upto 10 m).</b> <i>Unit = sqm ( For 1 sqm)</i>				
28.14	A	2812	a) <b>Labour</b> Unskilled	day	0.05		
			b) <b>Equipment</b> Add 3 % of Labour cost for Sledge hammer and other T&P				
			<b>Providing and Spreading manure on the grass turf.</b> <i>Unit = sqm ( For 100 sqm)</i>				
	B	2812	a) <b>Labour</b> Unskilled	day	0.04		
			b) <b>Material</b> Chemical manures	kg	7.00		
			c) <b>Equipment</b>				

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		
		<b>Turfing with Sods</b> 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>		
		<b>a) Labour</b>		
		Skilled	day	0.12
		Unskilled	day	3.00
		<b>b) Equipment</b>		
		Tractor-trolley	hour	1.00
		<b>c) Material</b>		
		Farm yard manure	cum	0.18
		Cost of water	KL	12.00
	D	<b>Seeding and Mulching</b> 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>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	10.00
		<b>b) Equipment</b>		
		Tractor-trolley	hour	2.40
		<b>c) Material</b>		
		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	<b>Spreading of Sludge Farm Yard Manure or/and good Earth</b> 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>		
		<b>a) Labour</b>		
		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	<b>Grassing with 'Doobs' Grass</b> 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>		
			<b>In rows 15 cm apart in either direction</b> <b>a) Labour</b> Skilled day 1.00 Unskilled day 10.00 <b>b) Material</b> Doob grass kg 500.00		
	(ii)		<b>In rows 7.5 cm apart in either direction</b> <b>a) Labour</b> Skilled day 2.00 Unskilled day 14.00 <b>b) Equipment</b> Water tanker hour 6.00 <b>c) Material</b> Doob grass kg 1000.00		
			<b>Remarks:</b> 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	<b>Making Lawns including Ploughing and Dragging</b> 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>		
			<b>a) Labour</b> Skilled day 2.00 Unskilled day 15.00 <b>b) Equipment</b> Tractor with tiller hour 6.00 <b>c) Material</b> manure cum 1.80 Fine grass kg 1000.00		
28.18		2811	<b>Maintenance of Lawns or Turfing of Slopes</b> 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	<b>Turfing Lawns with Fine Grassing including Ploughing, Dressing</b> <b>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</b>		
		<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)	<b>Maintenance of Lawns with Fine Grassing for the First Year</b> <b>Regular Maintenance of lawns with fine grassing for the first year including watering etc.</b>		
		<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)	<b>Planting and Maintaining of Permanent Hedges</b> <b>Planting permanent hedges including digging of trenches</b>		
		<b>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</b>		
		<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		
		<b>Maintenance of hedge for one year</b>				
		<i>Unit = meter ( For 100 m)</i>				
		<b>a) Labour</b>				
		Skilled	day	3.00		
		Unskilled	day	30.00		
		<b>b) Material</b>				
		Manure	cum	2.00		
	Pesticide	kg	0.50			
	Cost of water	KL	30.00			
	Hedge plants	nos	68.00			
	(a)	2807	<b>Planting and Maintaining of Flowering Plants and Shrubs</b>			
			<b>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.)</b>			
			<i>Unit = meter ( For 1000 m)</i>			
			<b>a) Labour</b>			
			Skilled	day	2.00	
			Unskilled	day	12.00	
			<b>b) Material</b>			
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	<b>Providing and Maintenance of flowering plants and shrubs in central verge for one year</b>				
		<i>Unit = km ( For one Km)</i>				
		<b>a) Labour</b>				
		Skilled	day	36.00		
		Unskilled	day	365.00		
		<b>b) Material</b>				
		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	<b>Planting of Trees and their Maintenance for one Year</b>				

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><b>Edging with 2nd Class Bricks, Laid Dry Lengthwise</b>  <b>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</b>  <i>Unit = meter ( For 1000 meter)</i></p> <p><b>a) Labour</b>                      Skilled                      Unskilled</p> <p><b>b) Material</b>                      Brick</p>	day day nos	8.00 8.00 5000.00
28.27	2811	<p><b>Making Tree Guard 53 cm dia and 1.3 meter height as per Design from empty bitumen drums</b>  <b>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</b>  <i>Unit = nos. ( For 5 nos tree guard)</i></p> <p><b>a) Labour</b>                      Skilled (Blacksmith)                      Unskilled</p> <p><b>b) Material</b>                      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><b>Making Tree Guard 53 cm dia and 2 meter height as per Design from empty bitumen drums</b>  <b>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</b>  <i>Unit = nos. ( For 5 nos. tree guard)</i></p> <p><b>a) Labour</b>                      Skilled (Blacksmith)                      Unskilled</p> <p><b>b) Material</b>                      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
28.32	2807	<i>Unit = nos. ( For 10 nos.)</i>		
		<b>a) Labour</b>		
		Skilled (Blacksmith/ welder)	day	8.00
		Unskilled	day	8.00
		<b>b) Material</b>		
		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		
		<b>c) Equipment</b>		
		Tractor-trolley	hour	6.00
		<b>d) Painting</b>		
		Painting two coats including priming	sqm	1.50
		<b>Compensatory Afforestation</b>		
		<b>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</b>		
		<i>Unit = sqm ( For 10,000 sqm)</i>		
		<b>a) Labour</b>		
		<b>i) Planting</b>		
		Skilled	day	3.00
		Unskilled	day	25.00
		<b>ii) For Maintenance for one year</b>		
		Skilled	day	5.00
		Unskilled	day	50.00
<b>b) Equipment</b>				
Dozer	hour	12.00		
<b>c) Material</b>				
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		
<b>Remarks:</b>		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	<b>Maintenance</b> <b>Carryout Routine ( regular maintenance) of Black top/ Gravel road in plain area ( Terai) as per Technical Specifications and direction of the Engineer,</b> <b>Unit = Km - day</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> fuel Training ARMP Insurance First aid <b>c) Equipment</b> Tools and plants Maintenance of tools  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.	day day 5 % of Labour cost 1.7 % of Labour cost 1 % of Labour cost 0.3 % of Labour cost 9 % of Labour cost 3 % of Labour cost	0.05 0.20
	B		<b>Carryout Routine ( regular maintenance) of Black top/ Gravel road in Hilly area as per Technical Specifications and direction of the Engineer,</b> <b>Unit = Km - day</b> <b>a) Labour</b> Skilled Unskilled <b>b) Material</b> fuel Training ARMP Insurance First aid <b>c) Equipment</b> Tools and plants Maintenance of tools  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.	day day 5 % of Labour cost 1.7 % of Labour cost 1 % of Labour cost 0.3 % of Labour cost 9 % of Labour cost 3 % of Labour cost	0.05 0.33
			<b>Remarks:</b>  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.		

NORMS FOR RATE ANALYSIS

S No	Ref. to SS	Description of works / Resources	Unit	Quantity																																																		
29.2	2900	<p><b>Guideline for planning of maintenance activities</b></p> <p><b>Carryout Routine ( reactive ) maintenance, Guide lines for working out quantities from year of surfacing as per Technical Specifications and direction of the Engineer.</b></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																																																			
	<b>Remarks:</b>	<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>B</b>	<p><b>Guidelines for calculation of Rating value based on quantity (%) of distress of Highway</b></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>&gt;10</td> <td>5 to 10</td> <td>&lt;5</td> <td>1.00</td> </tr> <tr> <td>Raveling(%)</td> <td>&gt;10</td> <td>1 to 10</td> <td>&lt;1</td> <td>0.75</td> </tr> <tr> <td>Potholes(%)</td> <td>&gt;1</td> <td>0.1 to 1</td> <td>&lt;0.1</td> <td>0.50</td> </tr> <tr> <td>Shoving(%)</td> <td>&gt;1</td> <td>0.1 to 1</td> <td>&lt;0.1</td> <td>1.00</td> </tr> <tr> <td>Patching(%)</td> <td>&gt;10</td> <td>1 to 10</td> <td>&lt;1</td> <td>0.75</td> </tr> <tr> <td>Settlement and Depression(%)</td> <td>&gt;5</td> <td>1 to 5</td> <td>&lt;1</td> <td>0.75</td> </tr> <tr> <td>Rut Depth(mm) using 3 m straingth edge</td> <td>&gt;10</td> <td>5 to 10</td> <td>&lt;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	<b>Guidelines for serviceability indicator of highway</b>			
		<b>Serviceability Indicators for Highways</b>			
	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
	<b>Remarks:</b>	<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><b>Providing required material and carryout Routine ( regular + reactive maintenance) of Black top road as per Technical Specifications.</b>  <i>Unit = 20 km per year ( For 20 km length )</i></p> <p><b>a) Labour</b>                      Skilled day 365.00                      Unskilled day 3285.00</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      Tools and plants maintenance etc. <b>12 % of Labour cost</b>                      Air compressor hour as per                      Hot mix plant hour requireme                      Tipper hour nts                      Smooth wheeled roller hour</p>			
	<b>Remarks:</b>	<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	<b>Restoration of Rain Cuts</b> <b>Providing and restoration of rain cuts in embankment slopes as per specification and direction of the Engineer.</b> <i>Unit = cum ( For 1 cum)</i> <b>a) Labour</b> Skilled Unskilled	day day	0.10 0.75
29.5	2909	<b>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.</b> <b>Manual means</b> <i>Unit = cum ( For 10 cum)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Equipment</b> Plate compactor <b>(c) Materials</b> Compensation for earth Taken from private land	day day hour cum	0.04 6.24 3.00 7.50
		<b>Remarks:</b> 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	<b>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.</b> <b>Mechanical Means including conveyance of earth from other surrounding area with lead</b> <i>Unit = cum ( For 50 cum)</i> <b>a) Labour</b> Skilled Unskilled <b>b) Equipment</b> Excavator Tipper Plate compactor <b>(c) Materials</b> 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
		<b>Remarks:</b> 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
29.10	(i)	2903	<p><b>(c) Materials</b></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><b>Maintenance of bituminous surface road with Emulsion</b></p> <p><b>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.</b></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><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>Unskilled day 20.00</p> <p><b>b) Materials</b></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><b>c) Equipment</b></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><b>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.</b></p> <p><i>Unit = sqm ( For 200 sqm)</i></p> <p><b>a) Labour</b></p> <p>Skilled day 2.00</p>	day	2.00

NORMS FOR RATE ANALYSIS

S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	18.00
			<b>b) Materials</b>		
			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
			<b>c) Equipment</b>		
			Concrete mixer / mixing plant	hour	6.00
			Air compressor	hour	6.00
			Emulsion pressure distributor	hour	6.00
			Smooth wheeled roller	hour	6.00
			Cationic Emulsion may use for prime coat, Tack coat and Premix carpet.		
29.11	A	2903	<b>Filling Pot-holes and Patch Repairs</b> <b>Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20 mm.</b> <b>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.</b> <i>Unit = Sqm ( For 600 sqm / 12 cum or 23.7 tonne)</i>		
			<b>a) Labour</b>		
			Unskilled	day	6.00
			Skilled	day	1.00
			<b>b) Material</b>		
			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
			<b>c) Equipment</b>		
			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	<b>Filling Pot-holes and Patch Repairs with Bituminous concrete, 40 mm.</b> <b>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.</b> <i>Unit = Sqm ( For 400 sqm/ 16 cum or 36.7 tonne)</i>		
			<b>a) Labour</b>		

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>b) Material</b>		
		I) Bitumen	tonne	1.83
		ii) emulsion for tack coat	tonne	0.25
		iii) Aggregates		
		<b>Grading I - 19 mm(Nominal size)</b>		
		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		
		<b>Grading-II 13 mm (Nominal size)</b>		
		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
<b>c) Equipment</b>				
Air compressor	hour	6.00		
Hot mix plant	hour	1.00		
Tipper	hour	6.00		
Smooth wheeled roller	hour	6.00		
	<b>Remarks:</b>	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	<b>Crack Filling</b> <b>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</b> <i>Unit = meter (For 1000 m)</i>		
		<b>a) Labour</b>		
		Skilled	day	1.00
		Unskilled	day	4.00
		<b>b) Material</b>		
		Slow-curing bitumen emulsion	Kg	80.00
		Stone crusher dust	cum	0.05
29.13	2903	<b>Dusting</b> <b>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.</b> <i>Unit = Sqm ( For 3500 sqm)</i>		
		<b>a) Labour</b>		
		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>b) Material</b>					
			Stone crusher dust finer than 3 mm	cum	9.00			
			<b>Slurry Seal</b>					
			<b>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</b>					
			<i>Unit = Sqm ( For 3500 sqm, 40 cum)</i>					
			<b>a) Labour</b>					
			Skilled	day	1.00			
			Unskilled	day	6.00			
			<b>b) Equipment</b>					
			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			
			<b>c) Material</b>					
			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			<b>3 mm thickness</b>		
						<i>Unit = sqm (For 100 sqm, 30 cum)</i>		
<b>a) Labour</b>								
Skilled	day	1.00						
Unskilled	day	8.00						
<b>b) Equipment</b>								
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						
<b>c) Material</b>								
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						
<b>Remarks:</b>	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		<p><b>1.5 mm thickness</b>  <i>Unit = sqm (for 1200 sqm, 18 cum)</i></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 6.00</p> <p><b>b) Equipment</b>                      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</p> <p><b>c) Material</b>                      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</p>		
		<b>Remarks:</b>	1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately		
29.15		2903	<p><b>Fog Spray</b>  <b>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.</b>  <i>Unit = sqm ( For 5000 sqm)</i></p> <p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 5.00</p> <p><b>b) Equipment</b>                      Mechanical broom hour 6.00                      Air compressor hour 6.00                      Bitumen emulsion pressure distributor tonne 6.00</p> <p><b>c) Material</b>                      Emulsion tonne 4.00</p>		
		<b>Remarks:</b>	1. In case it is decided by the engineer to blind the fog spray, the following may be added		
			<p><b>a) Labour</b>                      Skilled day 1.00                      Unskilled day 4.00</p> <p><b>c) Material</b></p>		

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
			<b>Crack Prevention Courses</b>		
			<b>Stress Absorbing Membrane (SAM) crack width less than 6 mm</b>		
			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>		
			<b>a) Labour</b>		
			Skilled	day	1.00
			Unskilled	day	6.00
			<b>b) Equipment</b>		
			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
			<b>c) Material</b>		
			Modified binder	tonne	4.80
			Crushed stone aggregates 5.6 mm size	cum	53.00
	II		<b>Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm</b>		
			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>		
			<b>a) Labour</b>		
			Skilled	day	1.00
			Unskilled	day	6.00
			<b>b) Equipment</b>		
			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
			<b>c) Material</b>		
			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
			<b>Remarks:</b>  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		
	<b>Case - 1</b>		<b>Surface Dressing for maintenance works.</b> <b>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.</b> <i>Unit = sqm ( For 500 sqm)</i> <b>:-19 mm nominal chipping size</b>		
			<b>a) Labour</b> Unskilled Skilled	day day	87.00 11.00
			<b>b) Equipment</b> Bitumen boiler Vibratory roller Add: 0.5 per cent of (a) Labour for T&P	hour hour	6.00 6.00
			<b>c) Material</b> Bitumen Crushed stone chipping 19 mm nominal size	tonne cum	0.60 7.50
	<b>Case - II</b>		<b>Remarks:</b>  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		
			<b>13 mm nominal size chipping</b> <i>Unit = sqm ( For 750 sqm)</i>		
			<b>a) Labour</b> Unskilled Skilled	day day	58.00 10.00
			<b>b) Equipment</b> Bitumen boiler Vibratory roller Add: 0.5 per cent of (a) Labour for T&P	hour hour	6.00 6.00
			<b>c) Material</b> 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
	<b>Remarks:</b>	<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>		
	<b>Case - III</b>	<p><b>9.5 mm nominal size chipping</b></p> <p><i>Unit = sqm ( for 850 sqm)</i></p> <p><b>a) Labour</b></p> <p>Unskilled day 58.00</p> <p>Skilled day 10.00</p> <p><b>b) Equipment</b></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&amp;P .</p> <p><b>c) Material</b></p> <p>Bitumen tonne 0.77</p> <p>Crushed stone chipping, 9.5 mm nominal size cum 6.80</p>		
	<b>Remarks</b>	<p>1. Bitumen may be paving Bitumen, Polymer modified bitumen, Crumb rubber modified bitumen or other types as specified in contract.</p>		
	<b>Case - IV</b>	<p><b>6 mm nominal size chipping</b></p> <p><i>Unit = sqm ( for 850 sqm)</i></p> <p><b>a) Labour</b></p> <p>Unskilled day 58.00</p> <p>Skilled day 10.00</p> <p><b>b) Equipment</b></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&amp;P</p> <p><b>c) Material</b></p> <p>Bitumen tonne 0.64</p> <p>Crushed stone chippings 6 mm nominal size cum 3.40</p>		
	<b>Remarks</b>	<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	<p><b>Hill Side Drain Clearance</b></p> <p><b>Removal of earth from the choked hill side drain and disposing it on the valley side manually</b>  <i>Unit = meter ( For 10 meter)</i></p> <p>Assuming muck causing choking of drain to be 0.2 cum per meter, quantity of earth to be removed for 10 metres = 2 cum</p> <p><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>Unskilled day 1.00</p>		
29.19	A	2900, 900	<p><b>Land Slide Clearance in soil</b></p> <p><b>Clearance of land slides in soil and ordinary rock by machine and disposal of the same on the valley side</b>  <i>Unit = cum ( For 500 cum)</i></p> <p><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>Unskilled day 3.00</p> <p><b>b) Equipment</b></p> <p>Dozer/loader/Excavator hour 6.00</p>		
	B		<p><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.</b>  <i>Unit = cum ( For 300 cum)</i></p> <p><b>a) Labour</b></p> <p>Skilled day 1.00</p> <p>Unskilled day 1.00</p> <p><b>b) Equipment</b></p> <p>Dozer/loader/Excavator hour 6.00</p>		
		<b>Remarks:</b>	<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	
29.22	A	<b>Carryout Routine using Labour based method for Local road as per direction of the Engineer, Unit = Km- Annual District Road , Rural road class "A"</b>			
		Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 12 days per month for class "A" road			
		<b>a)Labour</b>			
		Supervisor	day	2.88	
		Unskilled	day	72.00	
		<b>b) Equipment</b>			
		Tools and plants	9 % of Labour cost		
		Maintenance of tools	3 % of Labour cost		
		B	<b>Village Road , Rural road class "B"</b>		
			Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 6 days per month for class "B" road		
			<b>a)Labour</b>		
			Supervisor	day	1.44
			Unskilled	day	36.00
			<b>b) Equipment</b>		
			Tools and plants	9 % of Labour cost	
			Maintenance of tools	3 % of Labour cost	
C	<b>Main Trail , Rural road Class "C"</b>				
	Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 3 days per month for class "C" road				
	<b>a)Labour</b>				
	Supervisor	day	0.72		
	Unskilled	day	18.00		
	<b>b) Equipment</b>				
	Tools and plants	9 % of Labour cost			
	Maintenance of tools	3 % of Labour cost			
D	<b>Village Trail , Rural road Class "D"</b>				
	Assuming each worker takes charge of routine maintenance of 2 km road stretch and works 1.5 days per month for class "D" road				
	<b>a)Labour</b>				
	Supervisor	day	0.36		
	Unskilled	day	9.00		
	<b>b) Equipment</b>				
	Tools and plants	9 % of Labour cost			
	Maintenance of tools	3 % of Labour cost			
	<b>Remarks :</b>	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	<b>Excavation of pits/trenches for sub-surface Geo-technical investigation in mixed soil and lifting of material all complete (Length &amp; breath depending upon working condition) as per direction of the Engineer.</b> <i>Unit = cum ( For 10 cum)</i> <b>Depth up to 3 m</b>		
	I		<b>a) Labour</b> Skilled Unskilled	day day	1.0 7.0
	II		<b>Depth up to 3 - 4.5 m</b> <i>Unit = cum ( For 10 cum)</i> <b>a) Labour</b> Skilled Unskilled	day day	1.0 9.0
30.2		3000	<b>Mobilisation and Demobilisation of drilling / Boring equipments, accessories, etc for sub-surface Geo-technical investigation as per direction .</b> <i>Unit = km-job ( For upto 50 Km)</i>		
	(i)		<b>BT Surfaced Road</b> Speed with load : 15 km / hour. <b>a) Labour</b> 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>b) Equipments.</b> Truck	day day day day day day hour	2.0 2.0 6.0 6.0 3.0 8.0
	<b>Remarks:</b>		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	<b>Erect dismantle and move boring rig with drilling equipments at each bore hole complete as directed by the Engineer..</b> <b>Unit = nos. ( for 2 nos of movement)</b> <b>a) Labour</b> 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>		
			<b>a) Labour</b>		
			Unskilled	day	4.0
			semi skilled	day	2.0
			Technician	day	1.0
			<b>b) Material</b>		
			Cost of water	KL	1.0
			<b>c) Equipments.</b>		
			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)		
			<b>a) Labour</b>		
			Unskilled	day	3.0
			semi skilled	day	1.0
			Technician	day	0.5
			<b>b) Material</b>		
			Cost of water	KL	2.0
			Drill bit	nos.	0.3
			Core box	meter	5.0
			<b>c) Equipment.</b>		
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
		<b>a) Labour</b> Unskilled semi skilled Technician	day day day	8.0 1.0 1.0
		<b>b) Material</b> Cost of water Drill bit Core box	KL nos. meter	2.0 1.0 5.0
		<b>c) Equipment.</b> 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	<b>Soft Rock</b>		
	(i)	Depth below bed level upto 5.0 m Unit = meter ( For upto 5 meter)		
		<b>a) Labour</b> Unskilled semi skilled Technician	day day day	6.0 1.0 1.0
		<b>b) Material</b> Cost of water Drill bit Core box	KL nos. meter	4.0 1.0 5.0
		<b>c) Equipment.</b> 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		

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



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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
30.9		3000	<p>a) <b>Labour</b>                      Technician                      Unskilled                      b) <b>Equipment</b>                      SPT hammer</p> <p><b>Providing &amp; 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 &amp; 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.</b>  <i>Unit= nos. ( For 10 nos)</i></p> <p>a) <b>Labour</b>  <u>for installation</u>                      Engineer / Technician                      semi skilled                      Unskilled                      for reading                      Engineer / Technician                      semi skilled  <u>for security</u>                      Unskilled                      b) <b>Equipment</b>                      piezometr ( 10 nos 10 m each for 3 month duration)</p>	day day day day day day day day day day day day meter	1.0 4.0 1.0 1.0 3.0 3.0 6.0 12.0 90.0 100.0
	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><b>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.</b>  <i>Unit = meter ( For 2 X 24 m span= 48 m)</i></p> <p>a) <b>Labour</b>                      Skilled day 8.00                      Unskilled day 40.00</p> <p>b) <b>Material</b>                      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>		
	<b>Remarks:</b>	<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><b>Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification</b>  <i>Unit = m (For 2 X 50 m span = 100 m)</i></p> <p>a) <b>Labour</b>                      Skilled day 30.00                      Unskilled day 60.00</p> <p>b) <b>Material:</b>                      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><b>Providing and fixing Drainage Spouts complete as per Drawing and Technical specifications.</b>  <i>Unit = no. ( For 10 no.)</i></p> <p>a) <b>Labour</b>  <u><b>For fabrication</b></u>                      Skilled (Blacksmith, welder etc.) day 1.00                      Unskilled day 2.00  <u><b>For fixing in position</b></u>                      Skilled day 1.00</p>		

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
			Unskilled	day	4.00
			<b>b) Material</b>		
			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.		
			<b>Remarks:</b>		
			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	<b>Filler joint</b> <b>Providing &amp; fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing &amp; Technical Specification.</b> <i>Unit = meter ( For 12 m, 12 m long X 250 mm wide)</i>		
			<b>a) Labour</b>		
			Unskilled	day	1.00
			Skilled	day	1.00
			<b>b) Material</b>		
			Copper plate	kg	55.00
	(ii)		<b>Providing &amp; fixing 20 mm thick compressible fiber board in expansion joint complete as per drawing &amp; Technical Specification.</b> <i>Unit = meter ( For 12 meter)</i>		
			<b>a) Labour</b>		
			Unskilled	day	1.00
			Skilled	day	1.00
			<b>b) Material</b>		
			20 mm thick compressible fiber board	sqm	3.00
	(iii)		<b>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.</b> <i>Unit = meter ( For 12 meter)</i>		
			<b>a) Labour</b>		
			Unskilled	day	1.00
			Skilled	day	1.00
			<b>b) Material</b>		
			Pre-moulded joint filler	sqm	3.60

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S No		Ref. to SS	Description of works / Resources	Unit	Quantity
	(iv)		<p><b>Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 per cent bitumen by weight</b>  <i>Unit = meter ( For 12 meter long X 100 mm wide X 10 mm deep)</i></p> <p><b>a) Labour</b>                      Unskilled                      Skilled</p> <p><b>b) Material</b>                      Sand                      Bitumen</p>	day day cum cum	1.00 1.00 0.012 0.001
	<b>Remarks:</b>		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><b>Asphaltic Plug joint</b>  <b>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.</b>  <i>Unit = meter ( For 12 meter)</i></p> <p><b>a) Labour</b>                      Unskilled                      Skilled</p> <p><b>b) Material</b>                      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><b>c) Equipment</b>                      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
	<b>Remarks:</b>		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.		

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S No	Ref. to SS	Description of works / Resources	Unit	Quantity
31.6	3105	<b>Tubular Steel Railing on Medium Weight Steel Channel ( ISMC series) 100 mm x 50 mm</b> 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>		
		<b>i) Excavation for foundation</b>	cum	12.96
		<b>ii) Foundation concrete M-15</b>	cum	6.48
		<b>iii) Painting of pipe</b>	sqm	47.10
		<b>iv) Painting of channel section</b>	sqm	21.60
		<b>a) Labour (For fixing at site)</b>		
		Unskilled	day	4.00
		Plumber / skilled	day	1.00
		<b>b) Material</b>		
		Steel pipe 50 mm external dia as per IS: 1239	meter	300.00
		Medium weight steel channel (ISMC series) 100 mm x 50 mm, 10.8 metres length @ 9.2 kg per meter	kg	993.60
		Add for drilling holes @ 2 per cent of cost of channels		
<b>c) Equipment</b>				
Tractor-trolley	hour	6.00		
31.7	3105	<b>Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level</b> 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>		
		<b>i) Excavation for foundation</b>	cum	12.96
		<b>ii) Foundation concrete M - 15</b>	cum	6.48
		<b>iii) RCC M - 20</b>	cum	3.20
		<b>iv) Painting of pipe</b>	sqm	47.10
		<b>a) Labour</b>		
		Skilled ( plumber)	day	1.00
		Unskilled	day	6.00
		<b>b) Material</b>		
		Steel pipe 50 mm dia as per IS: 1239	meter	300.00
		<b>c) Equipment</b>		
		Tractor-trolley	hour	6.00