GOVT OF ASSAM

PUBLIC WORKS ROADS DEPARTMENT

SCHEDULE OF RATES FOR RURAL ROADS FOR ALL DIVISIONS UNDER PWRD, ASSAM 2017-2018

Published by:
Commissioner & Special Secretary
Public Works Roads Department, Assam
Dispur, Guwahati - 6

FOREWORD

Government of India as well as the State Government has given specific importance for development of Rural Roads in India. Indian Road Congress on behalf of Ministry of Rural Development, Govt. of India has published “Specifications for Rural Roads & Cross Drainage Works” and “Standard Data book for Analysis of Rates for Rural Roads” with a consideration for development and standardization of specifications & rates all over the country.

On the basis of the “Standard Data book for Analysis of Rates for Rural Roads”, the Schedule of Rates for Rural Roads for all Divisions under Public Works Department, Assam was first published in the year 2005-06. As per guidelines for preparation of rates using MORD’s Standard data book, the Schedule of Rates is required to be updated every year considering the market variation of the basic rates of labour, materials and machineries.

Accordingly this Schedule of Rates for Rural Roads has been updated for the year 2017-18 considering the increase in the market rates for labour as well as cost of different materials like cement, steel, Bitumen, Aggregate etc.

The Schedule of Rates for Rural Roads is as per “Specification for Rural Roads 2004” published by IRC is applicable for Rural road works funded by agencies like World Bank, ADB etc in addition to PMGSY works, as these funding agencies insisted upon the department to follow the referred Data Book in preparing the DPR for their projects.

As per current revision of the specifications of Data Book in 2014 some new items has also been incorporated in this edition along with Long-span Bridges as per MORTH Guidelines.

This schedule is modeled as a schedule for finished item rates, the rates for the basic materials, obtained from various GOVT. Agency, have been adopted for computation. This S.O.R. shall come into force w.e.f. 27-02-2018.

Utmost efforts have also been made to collect various up-to-date market inputs from different sources, compile and study elaborately in the light of current price index and to incorporate the same in the present schedule of rates. However, rates involving the commodities like cement, Bitumen, Steel and competent authority as and when deem necessary may review.

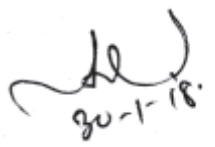
Every endeavor has been made to make the edition of SOR free from errors. In spite of that if any error/omission is noticed the same may kindly be brought to the notice of the undersigned for appropriate rectification.

I am sure the edition of the SOR in its present from would prove to be very useful to all practicing Rural Roads Engineers.

The Commissioner & Spl. Secretary to the Govt. of Assam
Public Works Roads Department, Assam
Dispur Secretariat, Guwahati – 781006

CERTIFICATE

Certified that the Schedule of Rates for Rural Roads for all divisions under Public Works Roads Department (PWRD), Assam for the year 2018-2019 has been prepared on the basis of Standard Data Book for Analysis of Rates for Rural Roads published by Indian Road Congress on behalf of the National Rural Development Agency, Ministry of Rural Development (MORD), Govt. of India, New Delhi.



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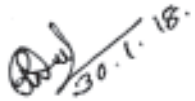

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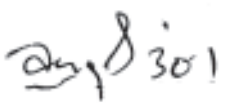

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PREAMBLE

Chapter	Description
1	Carriage of Materials
2	Site Clearance and Setting Out
3	Earthwork Erosion Control and Drainage
4	Sub Bases, Bases (Non-Bituminous) and Shoulders
5	Bases and Surface Courses (Bituminous)
6	Cement Concrete Pavement
7	Causeway and Submersible Bridges
8	Hill Road
9	Pipe Culverts
10	Traffic Signs, Markings & Other Road Appurtenances
11	Foundation
12	Substructure
13	Superstructure
14	Protection works
15	Maintenance of Roads

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

The basic approach for the preparation of Standard Data Book for Rural Roads is indicated as under:

1 Description of items: The description of items is given briefly and linked with the relevant Clauses of the Ministry of Rural Development's (MORD) Specifications wherever feasible, which may be referred for detailed description, provisions and interpretation

2 Use of Machinery

2.1. The Standard Data Book is based on the assumption that Rural Roads in our country are to be constructed with intermediate technology, i.e., manual means with medium input of machinery, wherever required to ensure the required quality of work.

2.2. For rolling, use of static roller has been generally considered. However, use of vibratory pneumatic tyre roller has been considered wherever required as per provisions of MORD Specifications.

3 Working Conditions

3.1. Rates have been analysed for average working conditions prevailing in the country.

3.2. Average achievable outputs of machines and labour have been considered taking into account the job and management factors

3.3. However, the output of machineries and labour reduces substantially in hilly areas as the altitude increases. Therefore, for hilly areas reduced outputs have been considered as indicated in the preamble of Chapter 8.

4 Overheads and contractors' profit :The overheads and contractors' profit is considered @12.5% (per cent) for items of road works and 20% (per cent) for items of bridge works.

4.1 The overheads are considered as per provision of Data Book considering additional percentage as indicated in the Data Book for prevailing rate of tax in the state,This is assumed to include interalia th following elements.

i. Site accomodation,setting up plant,accessroad,water supply,electricity and general site arrangements.

ii. Site office infrastructure.

iii. Expenditure on:
Corporate office of the Contractor
Site supervision by the Contractor
Preparation of "as built" drawings

iv. Mobilization/demobilization of sources.

v. Labour camps with minimum amenities, required as per labour laws.

vi Setting up of laboratories for quality control,field and laboratory testing for control of quality of various items of and documentation of test result as per requrement of MORD specifications.

vii Minor tools and plants(T&P) including needle vibrator requred for concrete work.

viii Survey instruments and the task of setting out of works including verification of line and dimensions (but excluding construction of bench marks and reference pillars which are separate items under setting out).

ix Taking of trial pits and bore holes

x Watch and ward

xi Arrangement for traffic and traffic management during construction

xii Expenditure on safe guarding environment during construction.

xiii Sundries

xiv Financing expenditure of the contractor.

xv Work insurance/compensation.

5 GST, Labour Welfare Cess, Swatch Bharat etc.

i. GST is not considered in the Analysis of Rates. GST applicable is to be provided separately in the Estimates.

ii. **Assam building and other construction workers welfare cess is not considered in the Analysis of Rates and to be provided separately in the Estimates.**

iii. **Swatch Bharat cess is not considered in the Analysis of Rates and to be provided separately in the Estimates.**

6 General:

6.1. The section and clause numbers refer to the MORD specifications for Rural roads 2004.

6.2. Additional assumptions made for analysing different items have been indicated in respective Chapters in the form of preamble and notes/footnotes wherever required.

6.3. For some of the items, certain size/specifications have been assumed. If size/specifications other than the same are adopted, corresponding modifications may be made in the inputs of analysis.

6.4 The sources of all materials and samples of materials are required to be approved by the Engineer before start of such work.

6.5 For reinforcing steel both HYSD and TMT bars conforminf to IS:1786 have been considered.

6.6 For pipe culverts both NP3 and NP4 pipes have been considered.

6.7 **A premium of 10% may be considered in the estimates only in emergency works within city area and whereever required only after being duly certified byrespective S.E. Concerned.**

6.8 **As per latest revised version of MoRD specification for rural Roads Specific importance to some new items like cold mix,Semi dense Biituminous concrete,soil stabilization in subgrade and Base,use of locally available marginal materials,Industrial wastes,provisions of proper road signs and other traffic control devices,Geosynthetics,Jute geo textiles alongwith construction of long span Bridges has been given and incorporated in this edition as per version of MORTH.**

6.9 Quality control of work shall be governed by the relevent MORD specifications.

6.10 A premium in percentage over the S.O.R. 2015-16 as indicated below may be allowed over the rates of this S.O.R.for preparation of estimates of work to be executed in the following

areas to cater for the probable extra cost involved due to the remotness of these places from the marketing centres of key construction materials,difficulties in transportation of materials and dearth of skilled labourers.

Sl No.	District/Sub-division	Premium in %	Remarks
1.	Dhemaji District	5%	**1. These premiums are applicable for preparation of Estimates only. 2.These premiums are not meant for tendering and billing purposes.**
2.	Karbialong District	10%	
3.	Dima Hasao.	10%	
4.	Majuli Sub-Division	10%	
5.	Sadia Sub division	10%	

7 Basic Inputs

7.1. The Standard Data Book is based on the requirements of basic inputs of materials, labour and machineries for various items.

7.2. The labour wages are as per rate fixed by the state government.The rates of material are asper the prevailing market rate.

7.3. The basic rates of materials, such as, stone boulders, stone for masonry, stone ballast (hand broken/machine broken), crushed aggregate, stone dust, moorum, gravel, lime, manure, sludge, quarry sweep, kankar, bricks, brick ballast, crushed slag, etc. at quarry/crusher sites shall be fixed by the respective states for various zones from time to time.

8 Plants and Equipment:

8.1. Keeping in view the job and managerial factors and the age factor of machines, the output of plant and equipment is taken approximately 70 per cent of the rated capacity given by manufacturer under ideal conditions.

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

8.3. Certain equipment, like, road rollers, are required to be available at site for complete period of the shift, though from the consideration of their output, they may be required only for 3 to 4 hours. This is necessitated to match with the output of other associate machine like HMP,Paver,etc.In such cases the hire chargees of Road rollers have been multipied with a factor of 0.65 to account for the idle period whereever considered appropriate.

8.4. Though electrically operated equipment, like, concrete mixers and vibrators have been provided, diesel operated equipment can be used where electricity is not available.

8.5. Wherever electric generator has not been provided to run a plant or equipment, it is assumed that it is fitted with a diesel engine

8.6. For small jobs where loading and unloading is required to be done manually, tractor-trolley has been considered for carriage instead of tipper.

8.7. Output of plant &equipment considered for the compacted quantities.

8.8. A water tank of 6 KL capacity which is commonly used at construction sites has been considered.

8.9. The usage charges for machines include ownership charges, cost of repair and maintenance including replacement of tyres and running and operating charges which includes crew, fuel and lubricants.

9 Labour:

9.1 One mate has been provided for 25 labours for all items of works.

9.2 The labour wages should be as per rates fixed by state Government.

10 Materials:

10.1. Quantities of materials considered in the rate analysis are approximate for the purpose of estimation and include normal wastages. Actual consumption would depend on mix design.

10.2. The rates of material include basic cost at locations of stone crushers/ factory/ rail head and cost of its carriage to the site of work/plant including loading, unloading and stacking.

10.3. The supply of materials will be taken either at the location of mixing plant or at the work site as per requirement of use.

10.4. Contractor will make his own arrangements for borrowing earth from private land. For borrowing Earth from Govt. land Forest Royality is to be paid by the contractor.

10.5. Credit for Dismantled Material: The dismantled materials should be examined and a realistic assessment made for credit for such materials, which can be utilized for works or auctioned

10.6. The basic rates include all octroi charges, toll tax, sale tax, VAT, municipal taxes,Forest royalityand other local taxes, etc.including loading and unloading.

11 Items of Culverts:

Items in Chapters 11, 12 & 13 on Foundation, Substructure and Superstructure cover both minor bridge works as well as slab culverts as per Chapter 1200 of MORD Specifications. Items of pipe culverts are, however, covered separately in Chapter 9.

12 Concrete Items:

12.1. For concrete work,the grades of concrete covered by the Data Book in accordance with MORD specification are

I) PCC M-15 grade to M-25 for structures (For lean concrete under foundation M-10 can be used).

ii) RCC grade M-20, M-25 and M-30 for structures

iii) Design mix concrete – M-25 and M-30 and M40 for concrete pavement

12.2. The rates accounts for input of material by weight and use of ordinary mixer

12.3. Use of vibrator for all concreting work has been included in the items.

12.4. Ten per cent extra cement may be provided for concreteing under water, where require.

12.5. Quantities of cement in various grades of cement concrete are to be as per nominal mix/

design mix. Grade of cement may also be adopted as per mix design.

12.6. Quantities of cement in various grades of cement concrete for structures have been taken as per IRC:21:2000 & IRC:78:2000.

12.7. Steel reinforcement for cement concrete work is required to be provided separately. The rate for the same has been analysed separately.

12.8. As per the MORD Specifications, the type of superstructure envisaged for rural roads are RCC slabs and box culverts not exceeding 15 m span as well brick/stone masonry arches and composite girder type of superstructure. RCC arches provided for in IRC:SP:

13 Measurement and Rates

13.1 Measurement of various items and their units shall be defined in the respective clauses of MORD specifaction.

13.2 The rates of various items of work shall include all sub items defined in the respective clauses of MORD specifications.

specifications.

14 Privileged Document

The Schedule of Rates is for Department use ONLY. It should not be produced in any court of law as reference/Authority and to that extent it is a privileged document.

PART-A

ROAD WORKS

CHAPTER-1
LOADING, UNLOADING,CARRIAGE,CRUSHING OF MATERIALS AND SETTING OUT

Preamble:

1 The rates of loading and unloading of various items include stacking.

2 The rates for loading and unloading has been given both by manual and mechanical means. Means of loading/unloading appropriate to the work and site is to be adopted

3 The rates for haulage of materials has been provided in terms of tonne-kilo metre (tkm) for ease of adoption depending upon the lead in km and load in tonnes.

4 The cost of carriage will vary depending upon the riding surface of the road.Provision has accordingly been made considering surfaced roads,subsurface gravel roadsand katcha tracks.

5 Rates for carriage of materials is exclusive of the loading ,unloading and stacking and this has to be added as applicable.

6 Carriage of materials if done by boats shall be paid at the same rates as given for carriage of materials by road.

Chapter 1
LOADING, UNLOADING, CARRIAGE CRUSHING OF MATERIALS AND SETTING OUT

Item No.	Description	Unit	Rate
1.1	Loading and Unloading of Lime, Aggregate, Stone Boulder, Brick Aggregate, Kankar, Building Rubbish, Crushed Slag, Stone for Masonry Work by Manual Means		
	i Loading of Lime, Aggregate, Stone Boulder, Brick Aggregate, Kankar, Building Rubbish, Crushed Slag, Stone for Masonry Work by manual means including a lead upto 30 m	cum	110.80
	ii Loading of Earth, Sand, Moorum, Manure, Flyash by manual means including a lead upto 30 m	cum	55.40
	iii Unloading of Lime, Aggregate, Stone Boulder, Brick Aggregate, Kankar, Building Rubbish, Crushed Slag, Stone for Masonry Work by manual means including a lead upto 30 m	cum	55.40
	iv Unloading of Earth,Sand, Moorum,Manure,Fly ash, by manual means including lead upto 30M	cum	34.60
1.2	Loading and Unloading Lime, Aggregate, Stone Boulder, Brick Aggregate, Kankar, Building Rubbish, Crushed Slag, Stone for Masonry Work by Mechanical Means		
	i Loading of Lime, Aggregate, Stone Boulder, Brick Aggregate, Kankar, Building Rubbish, Crushed Slag, Stone for Masonry Work by mechanical means including a lead upto 30 m	cum	63.40
	ii Loading of earth,sand,moorum,manure,fly ash by mechanical means including a lead upto 30 M	cum	33.30
	iii Unloading of Earth, Sand, Lime, Moorum, Aggregate, Stone Boulder, Brick Aggregate, Kankar, Building Rubbish, Manure, Crushed Slag, Flyash, Stone for Masonry Work by mechanical means.	cum	13.90
1.3	Loading, Unloading and Stacking of Bricks by Manual Means		
	i Loading of Bricks by manual means including a lead upto 30 m	1000 Nos.	189.50
	ii Unloading and Stacking of Bricks by manual means including a lead upto 30 m	1000 Nos.	189.50
1.4	Loading and Unloading of Cement by Manual Means		
	i Loading of Cement by manual means including a lead upto 30 m	t	682.40
	ii Unloading of Cement by manual means including a lead upto 30 m	t	136.50

Item No.	Description	Unit	Rate
1.5	Loading and Unloading of Structural Steel and Steel Bars by manual means		
	i Loading of Structural Steel, Steel Bars by manual means including a lead upto 30 m	t	145.10
	ii Unloading of Structural Steel, Steel Bars by manual means including a lead upto 30 m	t	145.10
1.6	Loading and Unloading of Bitumen Drums by Manual Means		
	i Loading of Bitumen Drums by manual means including a lead upto 30 m	t	3.60
	ii Unloading of Bitumen Drums by Manual Means including a lead upto 30 m	t	151.00
1.7	Loading and Unloading of Timber by Manual Means		
	i Loading of Timber by manual means including a lead upto 30 m	t	243.90
	ii Unloading of Timber by manual means including a lead upto 30 m	t	243.90
1.8	Loading and Unloading of C.C. Blocks, Kerb, etc.		
	i Loading with care C.C. Blocks, km Stone, 200 m Stone, Boundary Pillar, Kerb, Channel, Bond Stone, etc. by manual means including a lead upto 30 m	cum	359.00
	ii Unloading with care C.C. Blocks, km Stone, 200 m Stone, Boundary Pillar, Kerb, Channel, Bond Stone, etc. by manual means including a lead upto 30 m	cum	359.00
1.9	Loading and Unloading of Hume Pipes		
	i Loading of RCC Hume pipes by mechanical means including a lead upto 30 m		
	A. 1000 / 1200 mm dia Hume pipe	per pipe	78.50
	B. 750 mm dia Hume pipe	per pipe	47.10
	C. 600/450 mm dia Hume pipe	per pipe	33.60
	ii Unloading of RCC Hume pipe by manual means including a lead upto 30 m		
	A. 1000/1200 mm dia RCC Hume pipes	per pipe	447.50
	B. 750 mm dia Hume pipe	per pipe	372.90
	C. 600/450 mm dia Hume pipe	per pipe	279.70

Item No.	Description	Unit	Rate
	iii Unloading of RCC Hume pipes by mechanical means including a lead upto 30 m		
	A. 1000/1200 mm dia Hume pipe	per pipe	53.90
	B. 750 mm dia Hume pipe	per pipe	32.40
	C. 600/450 mm dia Hume pipe	per pipe	23.10
1.10	Haulage excluding Loading & Unloading		
	Haulage of materials by tipper excluding cost of loading, unloading and stacking.		
	Case-I : Surfaced Road	t.km	8.20
		Cum/km	14.90
	Case-II: Unsurfaced Gravel Road	t.km	10.20
		Cum/km	18.50
	Case-III: Katcha Track and Track in River Bed/Nallah Bed and Choe Bed	t.km	16.00
		Cum/km	29.10
1.11	Supply of Quarried stone and hand breaking		
	Supply of quarried stone and hand breaking into coarse aggregate to Grading 1 (90 mm to 45 mm) as per Table 400.8 of Technical Specifications.	cum	1,461.00
	Supply of quarried stone and hand breaking into coarse aggregate to Grading 2 (63 mm to 45 mm) as per Table 400.8 of Technical Specifications.	cum	1,548.00
	Supply of quarried stone and hand breaking into coarse aggregate to Grading 3 (53 mm to 22.4 mm) as per Table 400.8 of Technical Specifications.	cum	1,635.00
1.12	Crushing of Stone Aggregates 100 per cent passing through 53 mm sieve as per Table 500.6 of Technical Specifications.		
	Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 t/h capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates 100 per cent passing through 53 mm sieve as per Table 500.6 of Technical Specifications including the cost of stone.	cum	1,248.60
1.13	Crushing of Stone Aggregates 100 per cent passing through 22.4 mm sieve as per Table 500.6 of Technical Specifications.		

Item No.	Description	Unit	Rate
	Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 t/h capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates 100 per cent passing through 22.4 mm sieve as per Table 500.6 of Technical Specifications including the cost of stone.	cum	1,446.80
1.14	Crushing of Stone Aggregates Nominal Size 13.2 mm as per Table 500.9 of Technical Specifications.		
	Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 t/h capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 13.2 mm nominal size as per Table 500.9 of Technical Specifications including the cost of stone.	cum	1,705.00
1.15	Crushing of Stone Aggregates 9.5 mm Nominal Size as per Table 500.9 of Technical Specifications.		
	Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 t/h capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 9.5 mm nominal size as per Table 500.9 of Technical Specifications including the cost of stone.	cum	1,705.00
1.16	Setting Out		
	Unit=1Km		
	The analysis of rate per km shall account for the following:		
	i Reference benchmark one no.		
	ii Working benchmark 4 nos. per Km and near all drainage structure and bridges.		
	iii Reference pillars/Burjees @ 50 m interval on both sides of formation width.		
	iv The marking of centre line setting out curves and recording of levels,etc. by the surveyor will be incidental to the work and no extra payment shall be made for the same.		
	v Typical benchmark as per Drawing 200.1	each	6911.10
	vi Typical reference pillar as per Drawing 200.2	each	3437.90

Chapter – 2
SITE CLEARANCE

Preamble:

1 Unless otherwise stated, the rates include sorting and disposal of unserviceable material and stacking of serviceable material with all lifts and upto a lead of 1000 m.

2 The rates include Tools & Plants (T&P) and scaffolding required for items of dismantling.

3 Carriage of dismantled materials, bushes, branches of tree, etc. has been catered with a tractor-trolley of 3 tonnes capacity with manual loading and unloading @ 2 trips per hour within a lead of 1000 m. This will be economical for such works as compared with a tipper.

4 Where only grass wild growth is met with, rate of item No.2.1, i.e., clearing grass and removal of rubbish can be applied.

5 The dismantling of structures has been catered both by manual and mechanical means. The Engineer can use his discretion depending upon quantum of work and particular site conditions.

6 Rate analysis for removing of stumps and roots has also been provided separately.

7 Dismantling of Hume pipes has been catered manually as pipes can be easily rolled by men to a suitable stacking place within the right-of-way.

8 For dismantling of structures, which remain submerged in water, the cost may be enhanced by 50 per cent. If site conditions warrant lowering of water level to facilitate dismantling, the cost may be enhanced by additional 25 per cent.

9 Dismantling of utilities, like, water supply lines, electric and telephone lines is required to be done under the supervision of concerned departments with prior information to the user public.

10 In certain items of dismantling, like, pipe culverts, utilities, etc. excavation in earth and dismantling of masonary works is not included in this analysis for which suitable notes have been inserted in respective Chapters. These items are required to be priced separately based on actual quantities at site and nature of work.

11 The dismantled materials should be examined and a realistic assessment and provision should be made after due process for the salvage value for such materials, which can be utilized for works or auctioned.

12 In case where lead for disposal is more than 1000 m, extra cost of carriage is required to be added based on tonne-kilometerage as per Chapter 1.

13 All minor Tools & Plants (T&P) items required for dismantling have been considered to have been included in overhead charges.

Chapter 2
SITE CLEARANCE

Item No.	Description	Unit	Rate
2.1	Clearing Grass and Removal of Rubbish		
	Clearing grass and removal of rubbish up to a distance of 30 m outside the periphery of the area as per Technical Specification Clause 201.		
	By Manual Means	hectare	11,647.20
2.2	Clearing and Grubbing Road Land		
	Clearing and grubbing road land including uprooting wild vegetation, grass, bushes, shrubs, saplings and trees of girth upto 300 mm, removal of stumps of such trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, upto a lead of 1000 m including removal and disposal of top organic soil not exceeding 150 mm in thickness as per Technical Specification Clause 201.		
	i By Manual Means		
	(A) In area of non thorny jungle	hectare	42,648.30
	(B) In area of thorny jungle	hectare	61,247.30
	ii By Mechanical Means		
	(A) In area of non-thorny jungle	hectare	23,724.00
	(B) In area of thorny jungle	hectare	28,954.10
2.3	Cutting of Trees including Cutting of Trunks, Branches and Removal of Stumps		
	Cutting of trees, including cutting of trunks, branches and removal of stumps & roots, refilling, compaction of backfilling and stacking of serviceable material by manual means with all lifts as per Technical Specification Clause 201.		
	A. Lead upto 100 m		
	i Girth above 300 mm to 600 mm	each	206.90
	ii Girth above 600 mm to 900 mm	each	358.70
	iii Girth above 900 mm to 1800 mm	each	711.20
	iv Girth above 1800 mm to 2700 mm	each	1,358.00
	v Girth above 2700 mm to 4500 mm	each	2,789.60
	vi Girth above 4500 mm	each	8,199.70

Item No.	Description	Unit	Rate
	B Lead upto 1000 m		
	i Girth above 300 mm to 600 mm	each	220.70
	ii Girth above 600 mm to 900 mm	each	400.10
	iii Girth above 900 mm to 1800 mm	each	766.40
	iv Girth above 1800 mm to 2700 mm	each	1,440.80
	v Girth above 2700 mm to 4500 mm	each	2,881.60
	vi Girth above 4500 mm	each	8,429.80
2.4	Uprooting and Removing Stumps & Roots		
	Uprooting and removing stumps & roots,compaction of backfilling and staking of servicable material by manual means as per Technical Specification clause 201.		
	A Lead upto 100 m		
	i Girth above 300 mm to 600 mm	each	124.80
	ii Girth above 600 mm to 900 mm	each	197.70
	iii Girth above 900 mm to 1800 mm	each	419.40
	iv Girth above 1800 mm to 2700 mm	each	826.60
	v Girth above 2700 mm to 4500 mm	each	1,665.70
	vi Girth above 4500 mm	each	4,712.80
	B Lead upto 1000 m		
	i Girth above 300 mm to 600 mm	each	128.00
	ii Girth above 600 mm to 900 mm	each	209.20
	iii Girth above 900 mm to 1800 mm	each	433.20
	iv Girth above 1800 mm to 2700 mm	each	845.00
	v Girth above 2700 mm to 4500 mm	each	1,688.70
	vi Girth above 4500 mm	each	4,827.80
2.5	Dismantling of Structures Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever		

Item No.	Description	Unit	Rate
	necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 m as per Technical Specification Clause 202.		
	I By Manual Means		
	(A) Lime Concrete	cum	288.30
	(B) Cement Concrete	cum	365.60
	(C) Reinforced Cement Concrete	cum	978.30
	II By Mechanical Means		
	(A) Cement Concrete	cum	376.90
	(B) Reinforced Cement Concrete	cum	591.20
2.6	Dismantling Brick/Tile Work		
	Dismantling of existing structures like culverts, bridges, retaining walls and other structures comprising of brick masonry, including disposal of unserviceable material and stacking the serviceable material with all lift and lead of 1000 m as per Technical Specification Clause 202.		
	(A) Lime mortar	cum	171.80
	(B) Cement mortar	cum	226.40
	(C) Mud Morter	cum	155.90
	(D) Dry Brick Pitching or Brick Soling	cum	144.20
2.7	Dismantling Stone Masonry as per Technical Specification Clause 202.		
	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of stone masonry, including disposal of unserviceable material and stacking the serviceable material with all lift and lead of 1000 m as per Technical Specification Clause 202.		
	(A) Rubble Stone Masonry in Lime Mortar	cum	220.70
	(B) Rubble Stone Masonry in Cement Mortar	cum	175.00
	(C) Rubble Stone Masonry in Mud Mortar	cum	171.80
	(D) Dry Rubble Masonry	cum	160.20
	(E) Dismantling Stone Pitching / Dry Stone Spalls	cum	159.50
	(F) Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials	cum	197.50

Item No.	Description	Unit	Rate
2.8	Dismantling Wood Work Wrought and Planed Fixed in Frames of Trusses upto a height of 5 m above Plinth Level as per Technical Specification Clause 202.	cum	501.60
2.9	Dismantling Steel Work in all Types of Sections upto a height of 5 m above Plinth Level excluding Cutting of rivet as per Technical Specification Clause 202.		
	(A) Including dismembering	t	1,341.60
	(B) Excluding dismembering	t	947.70
	(C) Extra over Items (A) and (B) for cutting rivets	t	10.70
2.10	**Scraping of bricks dismantled from brick work including stacking as per Technical Specification Clause 202.**	1000 Nos.	1,019.10
2.11	**Scraping of Stone from Dismantled Stone Masonry as per Technical Specification Clause 202.**		
	In Cement or Lime Mortar	cum	409.30
2.12	**Scraping Plaster in Lime or Cement Mortar from Brick / Stone Masonry as per Technical Specification Clause 202.**	sqm	13.10
2.13	**Removing all types of Hume pipes and stacking within a lead of 1000 m including Earthwork and Dismantling of Masonry Works as per Technical Specification Clause 202.**		
	(A) Upto 600 mm dia Hume pipe	m	151.10
	(B) Above 600 mm to 900 mm dia Hume pipe	m	204.60
	(C) Above 900 mm dia Hume pipe	m	350.20
	Note : 1. The excavation of earth,dismantling of stone masonary work in head walls and protection works is not included which is to be measured and paid seperately.		
	2. Credit for retrives stone from masonary work may be taken as per actual availability.		
2.14	**Dismantling of Flexible Pavements**		
	Dismantling of flexible pavements and disposal of dismantled materials upto a lead of 100 m, stacking serviceable and unserviceable materials separately as per Technical Specification Clause 202		
	I By Manual Means		

Item No.	Description	Unit	Rate
	(A) Bituminous Courses	cum	531.80
	(B) Granular Courses	cum	388.00
	II By Mechanical Means		
	(A) Bituminous Courses	cum	226.50
2.15	Dismantling of Cement Concrete Pavements as per Technical Specification Clause 202.		
	Dismantling of cement concrete pavements by mechanical means using pneumatic tools breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials upto a lead of 1000 m, stacking serviceable and unserviceable materials separately	cum	1,010.40
2.16	Dismantling Guard Rails		
	Dismantling guard rails by manual means and disposal of dismantled material with all lifts and upto a lead of 1000 m, stacking serviceable materials and unserviceable materials separately as per Technical Specification Clause 202.	running m	58.40
2.17	Dismantling Kerb Stones		
	Dismantling kerb stones by manual means and disposal of dismantled material with all lifts and upto a lead of 1000 m as per Technical Specification Clause 202.	running m	11.40
2.18	Dismantling Kerb Stone Channels		
	Dismantling kerb stone channels by manual means and disposal of dismantled material with all lifts and upto a lead of 1000 m as per Technical Specification Clause 202.	running m	17.50
2.19	Dismantling Kilometre Stones		
	Dismantling of kilometre stones including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and backfilling of pit as per Technical Specification Clause 202.		
	(A) 5th km Stone	m	287.40
	(B) Ordinary km Stones	m	180.10
	(C) 200 m Stones	m	35.60
2.20	Dismantling of Fencing		
	Dismantling of barbed wire fencing / wire mesh fencing including posts, foundation concrete, backfilling of pit by manual means	running m	44.70

Item No.	Description	Unit	Rate
	including disposal of dismantled material with all lifts and upto a lead of 1000 m, stacking serviceable material and unserviceable material separately as per Technical Specification Clause 202.		
2.21	Dismantling of CI Water Pipe Line		
	Dismantling of CI water pipe line 600 mm dia including disposal with all lifts and lead upto 1000 m and stacking of serviceable material and unserviceable material separately under supervision of concerned department as per Technical Specification Clause 202.	running m	111.20
2.22	Removal of Cement Concrete Pipe of Sewer Gutter		
	Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and upto a lead of 1000 m and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works as per Technical Specification Clause 202.	running m	188.70
2.23	Removal of Telephone/Electric Poles and Lines		
	Removal of telephone/electric poles with wires including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and upto a lead of 1000 m and stacking the serviceable and unserviceable material separately as per Technical Specification Clause 202.	each	150.90

Chapter – 3
EARTHWORK, EROSION CONTROL AND DRAINAGE

Preamble:

1 The rates have been analysed using mechanical means. Manual means for certain items have also been provided which can be used for areas inaccessible to machines and also for small jobs.

2 In the rate analyses of earthwork, compacted volume of earth has been considered.

3 Cutting of earth by dozer has been proposed where the cut earth can be utilized for filling for embankment within a lead upto 100 m.

4 Where lead for transporting of earth is more than 100 m, excavator and tipper have been provided.

5 The rate caters for disposal of unsuitable soil only upto a distance of 1 km. The cost of transportation beyond the initial lead of 1 km will be paid separately based on tonne-kilometerage.

6 The replacement of unsuitable soil by suitable soil shall be provided separately in the estimate. The rate analysis for removal of unsuitable soil does not provide for replacement by suitable soil.

7 In cases where embankment is constructed with earth taken from roadway, the cost of depositing the earth at the site of embankment is already included in the disposal of excavated earth and, therefore, the input of dozer for spreading earth can be deleted.

8 For narrow and restricted areas, plate compactor has been proposed for compaction to achieve the desired density.

9 In case excavated rock is found suitable for incorporation in works, suitable credit for the available rock shall be given.

10 For excavation of structures refer to Chapter 11 dealing with items of Foundation.

11 The possibility of using the blasted rock fragments for backfilling behind structures or backfilling of foundation pits or filling in medians/separators or use in service road shall be examined before proposing disposal of excavated rock.

12 For inhabited areas, controlled blasting with limited charges of explosives has been provided. This involves smaller drill holes and additional requirement of electric detonators. Provision has been made accordingly.

13 Any work involved for crossing of water courses for irrigation purpose, etc. will be priced under respective items, like, excavation, grubbing, clearing, etc. for which rate analysis have separately been made.

14 Earth excavated from drains can be used in roadway berms. Hence carriage for disposal of same is not provided.

15 In case of rock fill embankment, it is assumed that material is available at site from rock cutting.

16 For widening of existing pavement less than 1.8 m, the rates for all items of this Chapter may be increased by 30 per cent.

Chapter 3
EARTHWORK, EROSION CONTROL AND DRAINAGE

Item No.	Description	Unit	Rate
3.1	Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means		
	a Manual means		
	Scarifying existing granular surface to a depth of 50 mm and disposal of scarified material with a lift upto 3 m and leads upto 1000 m as per Technical Specification Clause 301.4.	sqm	18.50
	b Mechanical means		
	Scarifying existing granular surface to adepth of 50mm and disposal of scarified material with a lift upto 3 m and lead upto 1000m as per Technical specification Clause 301.4	sqm	7.10
3.2	Scarifying Existing Bituminous Surface to a Depth of 150 mm by Mechanical Means		
	Scarifying the existing bituminous road surface to a depth of 150 mm and disposal of scarified material with a lift upto 3 m and lead upto 1000 m as per Technical Specification Clause 301.4.	sqm	6.50
3.3	Construction of Embankment with Material Obtained from Roadway Cutting		
	Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of Tables 300.1 and 300.2 as per Technical Specification Clause 301.5	cum	58.00
3.4	Construction of Embankment with Material Obtained from Borrow Pits		
	Construction of embankment with approved material obtained from borrow pits with a lift upto 1.5 m, transporting to site, spreading, grading to required slope and compacting to meet requirement of Tables 300.1 and 300.2 with a lead upto 1000 m as per Technical Specification Clause 301.5		
	i Private Land	cum	230.60
	ii Govt. Land	cum	230.60
3.5	Excavation in Cutting in Soil by manual means with lead upto 50 m		
	Excavation for roadway in soil using manual means for carrying of cut earth to embankment site with a lift upto 1.5 m and lead upto 50 m as per Technical Specification Clause 302.3 (Manual should be use where machines can not be deployed due to site condition)	cum	109.20
	ii Excavation in Soil with Dozer with lead upto 100 m		

Item No.	Description	Unit	Rate
	Excavation for roadway in soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 m, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross-sections.	cum	54.10
	iii Excavation in Soil using Hydraulic Excavator and Tippers with disposal upto 1000 m		
	Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross-sections, and transporting to the embankment location with a lift upto 1.5 m and lead upto 1000 m as per Technical Specification Clause 302.3	cum	59.90
3.6	Excavation in Marshy Soil		
	Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tippers and disposal with a lift upto 1.5 m and lead upto 1000 m, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross- sections as per Technical Specification Clause 302.3.6.	cum	65.50
3.7	Removal of Unsuitable Soil with Disposal upto 1000 m		
	Removal of unsuitable soil including excavation, loading and disposal upto 1000 m lead but excluding compaction ground supporting embankment subgrade replacement by suitable soil, which shall be paid separately as per Clause 303.5.2 as per Technical Specification Clause 302.3.11	cum	59.90
	Note: This item does not include replacement of unsuitable soil by suitable soil Replacement,Where required, is to be provided and paid seperately under Clause 303.5.2		
3.8	Excavation in ordinary Rock by manual means		
	i Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with a lift upto 1.5 m and lead upto 50 m as per Technical Specification Clause 302.3.5. (Manual means should be use where machines can not be deployed due to site condition)	cum	169.90
	ii Excavation in Ordinary Rock with Dozer with lead upto 100 m		
	Excavation for roadway in ordinary rock by deploying a dozer D-50 including cutting and pushing the cut earth to site of embankment upto a distance of 100 m (average lead 50 m), trimming bottom and side slopes in accordance with the requirements of lines, grades and cross-sections with lift upto 1.5 m.	cum	58.90
	iii Excavation in Ordinary Rock using Hydraulic Excavator and Tippers with disposal upto 1000 m		

Item No.	Description	Unit	Rate
	Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, transporting to embankment site with a lift upto 1.5 m and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross-sections as per Technical Specification Clause 302.3.5	cum	88.30
3.9	Excavation in Hard Rock (requiring blasting) with disposal upto 1000 m		
	i Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross-sections, loading and disposal of cut rock with a lift upto 1.5 m and leads upto 1000 m as per Technical Specification Clause 302.3.5	cum	215.00
	ii Excavation in Hard Rock (blasting prohibited)		
	Excavation for roadway in hard rock (blasting prohibited) with rock breakers including breaking rock, loading in tippers and disposal with a lift upto 1.5 m and lead upto 200 metres, trimming bottom and side slopes in accordance with requirements of lines, grades and cross- sections as per Technical Specification Clause 302.3.5		
	A Manual Means	cum	897.90
	B Mechanical Means	cum	447.00
	iii Excavation in Hard Rock (controlled blasting) with disposal upto 1000 m		
	Excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross-sections, loading and disposal of cut rock with a lift upto 1.5 m and leads upto 1000 m as per Technical Specification Clause 302.3.5	cum	233.30
3.10	Stripping, Storing and Relaying Top Soil from Right-of-Way (R.O.W)	cum	171.00
	Striping,storing and preservatio of top soil by keeping it damp in stock piles and keep wet till it is used by road side at 15 M interval and reapplication on embankment slopes,cut slopes and other areas in localities where the available embankment mate		
3.11	Stripping,Storing and Relaying Top soil from Borrow areas in Agricultural fields.		
	Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and relaying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels to the satisfaction of the farmer/land owner as per Technical Specification Clause 302.3.2.	cum	114.00
3.12	Turfing with Sods		

Item No.	Description	Unit	Rate
	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 as per Technical Specification Clause 309.	sqm	19.80
3.13	Seeding and Mulching		
	Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion @ 0.23 litre per sqm and laying and fixing jute netting, including watering for 3 months all as per Technical Specification Clause 310.	sqm	93.40
3.14	Construction of Subgrade and Earthen Shoulders		
	Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of Table 300.2 with lead upto 1000 m as per Technical Specification Clause 303.1.		
	(i) Private Land	cum	286.30
	(ii) Govt. land	cum	286.00
3.15	Compacting Original Ground		
	(i) Compacting original ground supporting embankment		
	Loosening, Levelling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Tables 300.1 and 300.2 for embankment construction as per Technical Specification Clause 301.4.1.	cum	19.80
	(ii) Compacting original ground supporting subgrade		
	Loosening of the ground upto a level of 300 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of Tables 300.1 and 300.2 for subgrade construction as per Technical Specification Clause 303.5.2.	cum	30.80
3.16	Repairs of damages caused by rain/spillage of water		
	Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with three wheel 80-100 kN static roller, complete as per Technical Specification Clause 301.5.5.1	sqm	1.70
3.17	Presplitting Rock Excavation Slopes		

Item No.	Description	Unit	Rate
	Carrying out excavation in hard rock to achive a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a D-50 dozer, loading in tipper by a front end loader and disposing of the material with a lift upto 1.5 m and lead upto 1000 m as per Technical Specification Clause 304.3	sqm	129.60
3.18	Construction of Embankment with Flyash/Pond ash available from Coal or Lignite Burning Thermal Plants as Waste Material		
	Construction of embankment with flyash conforming to Table 1 of IRC:SP:58 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layer of 200 mm thickness each at OMC, all as specified in IRC:SP:58 and as per approved plans with lead upto 1000 m as per Technical Specification Clause 306.	cum	197.20
3.19	Surface Drains in Soil		
	(i) Construction of unlined surface drains of average cross-sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions. Excavated material to be used in embankment with a lift upto 3m and lead of 50 m (average lead 25 m) as per Technical Specification Clause 307.		
	(A) Manual Means	m	58.20
	(B) Mechanical Means	m	25.70
	(II) Surface Drains in Ordinary Rock		
	Construction of unlined surface drain of average cross-sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and Technical Specification Clause 307. Excavated material to be used in embankment at site.		
	(A) Manual Means	m	87.40
	(B) Mechanical Means	m	33.00
	(III) Surface Drains in Hard Rock		
	Rate per m may be worked out based on quantity of hard rock as per design.		
	For rate of hard rock cutting refer releavant item in this chapter.		
	Note: Where lining of drain is provided,quantity shall be worked out based on approved design and drawing and priced on rate		
3.20	**Chute Drains**		
	A Providing chute drains across embankment slopes in approches of bridges and on horizontal curves as per drawings.		

Item No.	Description	Unit	Rate
	(a) Earthwork in exavation for foundation of structure as per drawings and technical specification clause 307 including setting out construction of shoring and bracing deleterious matter, dressing of sides and bottom and backfilling with approved material	cum	102.00
	(b) Providing and laying plain cement concrete M15 grade	cum	5403.90
	(c) Brick masonry in cement morter 1:5.	cum	6888.20
	(d) Plastering with cement morter 1:4.	cum	1211.70
	(e) Providing P.C.C. M 20 coping on the top of chute walls.	cum	895.10
B	**Providing chute drains across embankment slopes in approches of bridges and on horizontal curves as per drawings.**	m	
	(a) Earthwork in exacavation for foundation of structure as per drawing and technical specifications clause 307 including setting out construction of shoring and bracing deleterious matter, dressing of sides and backfilling with approved material (By manual means)	cum	102.00
	(b) Providing and laying plain cement concrete M 15 Grade	cum	5403.90
	(c) Coursed ruble stone masonary (2 nd sort) in cement morter 1:4	cum	4443.70
	(d) Plastering with cement morter 1:4	cum	1211.70
	(e) Providing P.C.C. M 20 Coping on the top of chute walls	cum	395.10

Chapter – 4
GRANULAR SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

Preamble:

1 For construction of sub-base, two alternatives as under have been provided.

a. Mix in place method

2 Construction of shoulders: - Earthen, Hard and Paved shoulders have been considered, the rates applicable are for subgrade, sub-base and different layers of pavement respectively.

3 In the case of improvement of subgrade with lime stabilization, soil is assumed to be available at the site and has not been provided for. Only lime has been catered. In the case of lime stabilization of sub-base, soil has been provided to form the sub-base

4 While providing for the rate of materials, detailed local enquires should be made and prevailing market rates ascertained from concerned suppliers in the area keeping in view the location of crushing plants and lead involved.

5 The quantities considered in the output are the compacted quantities.

Chapter 4
GRANULAR SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

Item No.	Description	Unit	Rate
4.1	**Granular Sub-base with Well Graded Material (Table 400.1)**		
	(Only for PMGSY work)		
	(A) By Mix in Place Method		
	Construction of granular sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with smooth wheel roller to achieve the desired density, complete as per Technical Specification Clause 401.		
	(I) For Grading I Material	cum	1,544.80
	(ii) For Grading II Material	cum	1,466.00
	(iii) For Grading III Material	cum	1,373.60
4.2	**Gravel/Soil-Aggregate Base (Table 400.2) Grading A**		
	(Only for PMGSY work)		
	i) Gravel/Soil-Aggregate Base (Table 400.2) Grading A		
	Construction of gravel/soil-aggregate base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with wheel 80-100 KN static roller to achieve the desired density, complete as per Technical Specifications Clause 402.	cum	1,608.60
	ii) Gravel/Soil-Aggregate Base (Table 400.2) Grading B		
	Construction of Granular sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotabator at OMC, and compacting with three wheel 80-100 KN static roller capacity to achieve the desired density, complete as per Technical Specification Clause -402.	cum	1,562.80
	iii) Gravel/Soil-Aggregate Base (Table 400.2) Grading C		
	Construction of granular sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with three wheel 80-100 KN static roller capacity to achieve the desired density, complete as per Technical specification Clause 402.	cum	1,509.70
	iv) Gravel/Soil Aggregate Base/Sub-base Nominal Maximum sixe grading 80 mm (Table 2.3 of IRC SP 77-2008)		
	Construction of Gravel/Soil aggregate sub-base / base by providing	cum	1107.20

Item No.	Description	Unit	Rate
	well graded material of nominal size grading 80mm as per Table 2.3 of IRC SP 77-2008, spreading in uniform layers with tractor mount appropriate grading arrangement on prepared surface, mixing by mix in place method at OMC with tractor mount appropriate rotavator attachment and compaction with three wheel 80-100 Kn capacity to achieve complete as per specification contained in para 2.2,3,6,3,7 of IRC SP 77-2008.		
	v) Gravel/Soil Aggregate Base/Sub Base Nominal Maximum sixze Grading 40 mm (Table 2.3 of IRC SP 77-2008.		
	Construction of Gravel/Soil aggregate sub-base/Base by providing well graded material of nominal size grading 40 mm as per Table 2.3 of IRC SP 77-2008, spreading in uniform layers with tractor mount appropriate grading arrangement on prepared surface, mixing by mix in place method at OMC with tractor mount appropriate rotavator attachment and compaction with three wheel 80-100 Kn static roller capacity to achieve the desired density complete as per specification contained in para 2, 2, 3, 6 and 3.7 of IRC SP 77-2008.	cum	1059.40
	vi Gravel/Soil Aggregate Base/Sub-Base Nominal Maximum size grading 20 mm (Table 2.3 of IRC SP 77-2008.		
	Construction of Gravel/Soil aggregate sub-base / Base by providing well graded material of nominal size grading 40 mm as per Table 2.3 of IRC SP-77-2008, spreading in uniform layers with tractor mount appropriate grading arrangement on prepared surface, mixing by mix in place method at OMC with tractor mount appropriate rotavator attachment and compaction with three wheel 80-100 Kn static roller capacity to achieve the desired density complete as per specification contained in para 2,2,3,6 and 3.7 of IRC SP 77-2008.	cum	1017.70
	vii Gravel/Soil aggregate Base/Sub-base Nominal Maximum size Grading 10 mm (Table 2.3 of IRC SP 77-2008		
	Construction of Gravel/Soil Aggregate Base/Surface by providing well graded material of nominal maximum size grading 10mm as per Table 2.3 of IRC SP 77-2008, spreading in uniform layers with tractor mount appropriate grading arrangement on prepared surface, mixing by mix in place method at OMC with tractor mount appropriate rotavator attachment and compaction with three wheel 80-100kn static roller capacity to achieve the desired density complete as per specifications contained in para 2.23, 3.6 and 3.7 of IRC SP 77-2008.	cum	931.50
	viii Gravel/Soil aggregrete Base/Sub-Base Nominal Maximum size Grading 5 mm (Table 2.3 of IRC SP 77-2008		
	Construction of Gravel/Soil aggrgrete Base/Surface by providing well graded material of nominal maximum size grading 5 mm as per Table 2.3 of IRC SP 77-2008, spreading in	cum	889.80

Item No.	Description	Unit	Rate
	uniform layers with tractor mount appropriate grading arrangement opn prepared surface, mixing by mix In Place Method At OMc with tractor mount appropriate rotavator attachment compacted with three wheel 80-100kn static roller capacity to achieve the desired density complete as per para 2.2, 3.6 and 3.7 of IRC SP 77-2008.		
4.3	Gravel/Soil-Aggregregate surface course (table 400.3)		
	(Only for PMGSY work)		
	i Construction of granular sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with three wheel 80-100 kN static roller capacity to achieve the desired density, complete as per Technical Specification Clause 402	cum	1,278.40
4.4	**Lime Stabilisation for Improving Subgrade**		
	Laying and spreading available soil in the subgrade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 2 per cent slaked lime having minimum 70 per cent of contents of CaO, grading with motor grader and compacting with the smooth wheel road roller at OMC to the desired density to form a layer of improved Sub-grade as per Technical Specification Cluase 403.		
	(A) By Manual Means	cum	356.40
	(B) By Mechanical Means	cum	321.40
4.5	Lime Treated Soil for Sub-Base		
	Providing, laying and spreading soil on a prepared sub-grade, pulverising, mixing the spread soil in place with rotavator with 4 per cent slaked lime with minimum content of 70 per cent of CaO, grading with motor grader and compacting with the road roller at OMC to achieve atleast 98 per cent of the max dry density to form a layer of sub-base as per Technical Specification Clause 403.	cum	584.50
4.6	Cement Treated Soil Sub-Base/Base		
	Providing, laying and spreading soil on a prepared sub-grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/ base as per Technical Specification Clause 404.		
	For 4 per cent quantity of cement by weight of soil	cum	628.40

Item No.	Description	Unit	Rate
4.7	**Water Bound Macadam Sub-base/base**		
	(Only for PMGSY work)		
	1) WBM Grading 1		
	Using stone screening Type-A 13.2 mm for Gr.I		
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill-up the interstices of coarse aggregate, watering and compacting to the required density Grading 1 as per Technical Specification Clause 404.		
	(A) By Manual Means	cum	2,580.30
	(B) By Mechanical Means	cum	2,625.50
2)	WBM Grading 2		
	Using stone screening Type-B 11.2 mm for Gr.II		
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with smooth wheel roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening/binding materials to fill-up the interstices of coarse aggregate, watering and compacting to the required density grading 2 as per Technical Specification Clause 405.		
	(A) By Manual Means	cum	2,732.70
	(B) By Mechanical Means	cum	2,455.60
3)	WBM Grading 3		
	Using stone screening Type-B 11.2 mm for Gr.III		
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with smooth wheel roller 80-100 kN in stages to proper grade and camber, applying and brooming, stone screening to fill-up the interstices of coarse aggregate, watering and compacting to the required density Grading 3 as per Technical Specification Clause 405.		
	(A) By Manual Means	cum	2,764.60
	(B) By Mechanical Means	cum	2,581.10
4.8	**Water Bound Macadam with Crushable Screenings**		

Item No.	Description	Unit	Rate
	(Only for PMGSY work)		
	1) WBM Grading 1		
	Using crushable screening such as moorum gravel for Gr.I		
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming, crushable screening to fill-up the interstices of coarse aggregate, watering and compacting to the required density Grading 1 as per Technical Specification Clause 405.		
	A) By Manual Means	cum	2,427.10
	B) By Mechanical Means	cum	2,155.40
2)	**WBM Grading 2**		
	Using crushable screening such as moorum gravel for Gr.II		
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming, crushable screening to fill-up the interstices of coarse aggregate, watering and compacting to the required density Grading 2 as per Technical Specification Clause 405.		
	(A) By Manual Means	cum	2,414.20
	(B) By Mechanical Means	cum	2,233.80
3)	**WBM Grading 3**		
	Using crushable screening such as moorum gravel for Gr.III		
	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming, crushable screening to fill-up the interstices of coarse aggregate, watering and compacting to the required density Grading 3 as per Technical Specification Clause 405.		
	(A) By Manual Means	cum	2,523.00
	(B) By Mechanical Means	cum	2,301.70
4.9	**Wet Mix Macadam**		
	Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mixer (Pug Mill), carriage of mixed material by tipper to site, laying in uniform layers	cum	2,113.70

Item No.	Description	Unit	Rate
	in sub-base/base course on a well prepared sub-base and compacting with smooth wheel roller of 80 to 100kN weight to achieve the desired density including lighting, barricading and maintenance of diversion, etc as per Tables 400.11 & 400.12 and Technical Specification Clause 406. By Mechanical Means with 1 km lead		
4.10	**Construction of Shoulders as per Technical Specification Clause 407.**		
	A Earthen Shoulders		
	The rate as applicable for sub-grade construction may be adopted.		
	B Hard Shoulders		
	Rate as applicable for sub-base and/or base may be adopted as per approved design.		
	C Paved Shoulders		
	The rates may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.		
4.11	**Granular sub-base/base/surface course with local materials (Table 400.13) by mix in place method normal Construction of granular sub-base by providing local material spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at once and compacting with smooth wheel roller to achieve the desired density complete as per Clause 401.4 as per Technical Specification Clause 408.**		
	I Using naturally occuring gravel	cum	630.20
	ii Using Gravel mix soil using	cum	477.50
4.12	**Construction of Water Bound Macadam using locally available material (Table 400.13)**		
	Providing, laying spreading and compacting local material in block or large discrete particles, such as kankar, Laterite, Dhandla etc. as per Table 400.13 to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with three wheel 80-100 kN static roller in stages to proper grade and camber, applying and brooming requisite type of screening /binding materials to fill-up the interstices of laid material watering and compacting to the required density as per Clause 405.3 and Technical Specification Cluase 408.	cum	1,117.00
4.13	**Lime-Flyash Stablised Soil Sub-base** Construction of sub-base using lime-flyash admixture with granular soil, free from organic matter/deleterious material or clayey silts and low plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50 per cent, flyash to conform to		

Item No.	Description	Unit	Rate
	gradation as per Clause 4.3 of IRC:SP:20, lime+flyash content ranging between 10 to 30 per cent, the minimum un-confined compressive strength and CBR value after 28-days curing and 4-days soaking to be 0.75 MPa and 25 per cent respectively, all as specified in IRC:88 including a lead upto 1000 m as per Technical Specification Cluase 409.		
	(A) For earth taken from Private source	cum	522.00
	(B) For earth taken from Govt.Land	cum	522.00
4.14	**Construction of Sub-base/Course Using Crushed Slag as per Table 400.19**		
	Construction of Sub-base by providing crushed slag spreading in uniform layer with motor grader on prepared surface mixing by mix-in-place method with Rotavator @ OMC, and compacting with three wheel 80-100 kN static roller to achieve the desired density complete as per Technical Specifications Cluase 402.4 and 410.3.2	cum	910.00
4.15	**Water Bound Macadam using crushed slag**		
	Providing, laying, spreading and compacting crushed slag to water Bound Macadam specification including spreading in uniform thickness, hand packing rolling with smooth wheel roller 80-100 kN in stages to proper grade and camber, applying and brooming requisite type of screening/binding materials to fill up the interstees of crushed slag watering and compacting to the required density as per Clause 405.3 and Technical Specification Cluase 410.3.2.	cum	1,212.60
4.16	**Cement Bound Granular Material sub-base/base**		
	Providing laying and spreading granulated blast furnace slag on a prepared sub-grade pulverising adding the designed quantitity of cement to the spread granulated blast furnace slag mixing in place with rotavator grading with the mortar grader and compacting with smooth wheel roller 80-100 kN at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/ base as per Technical Specification Clauses 404.3 and 410.4.2.	cum	665.50
4.17	**Crusher Run Macadam Base**		
	Providing crushed run stone aggregate greading conforming to table 400.20 depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a three wheel 80-100 kN static roller as per Technical Specification Clause 411 to form a layer of sub-base/base		
	A) By mix-in-place method		
	i With 53 mm maximum size of aggregates	cum	2,189.10
	ii With 37.5 mm maximum size of aggregates	cum	1,980.20
	(B) By mixing plant method		

Item No.	Description	Unit	Rate
	i With 53 mm maximum size of aggregates	cum	2,413.90
	ii With 37.5 mm maximum size of aggregates	cum	2,054.70
4.18	**Brick Soling**		
	Laying brick soling layer on prepared sub-grade with brick on end edging according to lines, graded and cross-section shown on the drawing filling joints with sand and earth, spreading 25 mm thick layer of earth over brick soling, watering and rolliing the same with three wheel road roller 80-100 kN as per Technical Specification Clause 412	sqm	631.70
4.19	**Stone Set Pavement**		
	Providing and laying stone set pavement on prepared surface with sub-base 100 mm thick compacted Granular Sub-base as per Clause 401.4 and base 75 mm thick compacted water bound macadam grading 2 as per Clause 405.3. The 150 mm thick hammer desired stones are laid in the herring one or stretched bond pattern. The stones are compacted into the bedding sand of 40 mm over the WBM base bounded by edge stone using suitable compacting device. The gaps are filled with fine sand stone dust as per Technical Specification Clause 413.4	sqm	786.70

Chapter – 5
BASES AND SURFACE COURSES (BITUMINOUS)

Preamble:

1 Various alternatives for machines and materials have been provided. The one that suits a particular situation and design may be adopted.

2 The outputs considered for construction equipment are for compacted quantities of relevant items and not for loose quantities.

3 In case of prime coat and tack coat, average quantities of binder indicated in specifications have been taken.

4 Tack coat and prime coat, wherever provided, are required to be measured and paid separately.

5 Cleaning of surface is a part of the item of prime coat and tack coat. As such cleaning of surface has not been provided for bituminous courses as the same is already catered in prime/tack coat. However, for those cases where such coats are not required to be done, cleaning of surface shall be included and paid.

6 Rolling of bituminous courses is required to be done as per Clause 504.3.6 of MORD Specifications. Provision in the analysis has been made accordingly. It has been observed during actual practice at work sites, that the availability of road roller is generally inadequate. As compaction is the key to good construction, this point is being specifically highlighted to ensure that adequate number of road rollers as per provision in the rate analysis are deployed at site.

7 Spreading of bituminous materials shall be done by mechanical means except in areas where a mechanical paver cannot have access.

8 Hot Mazdoor is the one who work for Bitumen heating/spreading or spreading of hot bituminous mix. He will be paid the same wages. However, he will be provided safety kits containing normally gumboots, hand gloves, dark goggles, barnol, country soap, coconut oil, tarring outfits, etc. For this purpose, additional 0.5 per cent sundries have been provided in the analysis of rates in addition to the normal sundries covered by overheads.

9 Where the proposed aggregates fail to pass the stripping value test, an approved adhesion agent shall be added to the binder as per Clause 507.2.4 with the approval of the Engineer and cost of the adhesion agent shall be added under the subhead of materials.

10 The Factor for usage of rollers has been taken as 0.65 in case of Bituminous Macadam only.

11 Rate analysis has been given separately using various types of bitumen, i.e., penetrations grade S90, S65, Polymer Modified Bitumen and Natural Rubber Modified Bitumen to facilitate preparation of Standard Schedule of Rates.

Chapter 5
BASES AND SURFACE COURSES (BITUMINOUS)

Item No.	Description	Unit	Rate
5.1	**Prime Coat**		
	i Low porosity		
	Providing and applying primer coat with bitumen emulsion (SS-1) on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.70-1.0 kg/sqm using mechanical means as per Technical Specification Clause 502	sqm	27.90
	ii Medium porosity		
	Providing and applying primer coat with Bitumen emulsion (SS-1) on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.90- 1.2 kg/sqm using mechanical means as per Technical Specification Clause 502.	sqm	34.20
	iii High porosity		
	Providing and applying primer coat with Bitumen emulsion (SS-1) on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 1.2-1.5 kg/sqm using mechanical means as per Technical Specification Clause 502.	sqm	43.80
5.2	**Tack Coat**		
	i Providing and applying tack coat with Bitumen emulsion (RS-1) using emulsion distributor at the rate of 0.20 to 0.25 kg per sqm on the prepared bituminous surface cleaned with Hydraulic broom as per Technical Specification Clause 503.	sqm	8.60
	ii Providing and applying tack coat with Bitumen emulsion (RS-1) using emulsion distributor at the rate of 0.25 to 0.30 kg per sqm on the prepared dry and hungry bituminous surface cleaned with Hydraulic broom as per Technical Specification Clause 503.	sqm	10.20
	iii Providing and applying tack coat with Bitumen emulsion (RS-1) using emulsion distributor at the rate of 0.25 to 0.30 kg per sqm on the prepared granular surfaces treated with primer & cleaned with Hydraulic broom as per Technical Specification Clause 503.	sqm	10.20
	iv Providing and applying tack coat with Bitumen emulsion (RS-1) using emulsion pressure distributor at the rate of 0.30 to 0.35 kg per sqm on the prepared non-bituminous surfaces (cement concrete pavement) cleaned with Hydraulic broom as per Technical Specification Clause 503.	sqm	11.80
5.3	**Bituminous Macadam**		
	i Providing and laying bituminous macadam with hot mix	cum	7,257.90

Item No.	Description	Unit	Rate
	plant using crushed aggregates of grading as per Table 500.4 premixed with bituminous binder, transported to site upto a lead of 1000 m laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled to achieve the desired compaction as per Technical Specification Clause 504.		
	ii Providing and laying Cold Mix bituminous macadam with Drum mix plant using crushed aggregates of grading as per Table 500.4 premixed with Cold mix binder, transported to site upto a lead of 1000 m laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled to achieve the desired compaction as per Technical Specification (IRC:SP:100-2014).	cum	9,132.70
5.4	**Built-Up Spray Grout**		
	Providing, laying and rolling of built-up spray grout layer over prepared base consisting of a two layer composite construction of crushed coarse aggregates using motor grader for aggregates. Key stone chips spreader may be used with application of bituminous binder after each layer, and with key aggregates placed on top of the second layer to serve as a base, conforming to the line, grades and cross-section specified, the compacted layer thickness being 75 mm as per Technical Specification Clause 505.		
	A By Manual Means		
	i Bitumen (S-90)	sqm	359.50
	ii Bitumen (S-65)	sqm	362.70
	B By Mechanical Means(S90)	sqm	303.10
5.5	**Modified Penetration Macadam**		
	Construction of penetration macadam over prepared base by providing a layer of compacted crushed coarse aggregate using chips spreader with alternate applications of bituminous binder and key aggregates and rolling with a three wheel 80-100 kN static roller to achieve the desired degree of compaction as per Technical Specification Clause 506.		
	A 50 mm thick		
	i Bitumen (S-90)	sqm	220.80
	B 75 mm thick		
	i Bitumen (S-90)	sqm	284.30
	ii Bitumen (S-65)	sqm	286.50
5.6	**Surface Dressing using Bituminous (Penetrations grade / modified bitumen) Binder**		

Item No.	Description	Unit	Rate
	Providing and laying surface dressing as wearing course consisting of a layer of bituminous binder laid on the prepared surface, followed by a cover of crushed stone aggregates of specified size and rolling with three wheel 80-100 kN static roller including cleaning the road surface as per Technical Specification Clause 507.		
	A By Manual Means		
	Case – I: Nominal chipping size 13.2 mm		
	i Bitumen (S-90)	sqm	89.90
	ii Bitumen (S-65)	sqm	91.00
	iii Polymer Modified Bitumen	sqm	83.20
	iv Crumb Rubber Modified Bitumen	sqm	87.20
	Case – II: Nominal chipping size 9.5 mm		
	i Bitumen (S-90)	sqm	78.30
	ii Bitumen (S-65)	sqm	79.30
	iii Polymer Modified Bitumen	sqm	72.00
	iv Crumb Rubber Modified Bitumen	sqm	75.90
	0		
	B By Mechanical Means		
	Case – I: Nominal chipping size 13.2 mm		
	i Bitumen (S-90)	sqm	72.40
	ii Bitumen (S-65)	sqm	69.70
	iii Polymer Modified Bitumen	sqm	61.90
	iv Crumb Rubber Modified Bitumen	sqm	65.90
	0		
	Case – II: Nominal chipping size 9.5 mm		
	i Bitumen (S-90)	sqm	60.50
	ii Bitumen (S-65)	sqm	61.50
	iii Polymer Modified Bitumen	sqm	54.50
	iv Crumb Rubber Modified Bitumen	sqm	58.10
5.7	**Surface Dressing using Bitumen Emulsion**		
	Providing and laying surface dressing as wearing course consisting of a layer of bitumen emulsion laid on the prepared surface,		

Item No.	Description	Unit	Rate
	followed by a cover of crushed stone chippings of specified size and rolling with 80-100 kN roller including cleaning the road surface as per Technical Specification Clause 507.		
	A By Manual Means		
	Case – I: Nominal aggregate size 13.2 mm	sqm	88.30
	Case – II: Nominal chipping size 9.5 mm	sqm	78.80
	B By Mechanical Means		
	Case – I: Nominal chipping size 13.2 mm	sqm	72.60
	Case – II: Nominal chipping size 9.5 mm	sqm	65.60
5.8	**Pre-coating Chips**		
	Pre-coating of chips with 1 per cent of paving bitumen by weight of chips in a suitable mixer duly heated to 160 degree C as per Technical Specification Clause 507.2.5		
	i Bitumen (S-90)	cum	1,700.80
	ii Bitumen (S-65)	cum	1,718.00
5.9	**20mm thick Open-Graded Premix Carpet using Bituminous (penetration grade/modified bitumen) Binder**		
	Providing, laying and rolling of open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 80-100 kN static roller capacity, finished to required level and grades to be followed by seal coat of either Type A or Type B or Type C as per Technical Specification Clause 508.		
	Case - I By Manual Means		
	i Bitumen (S-90)	sqm	165.80
	ii Bitumen (S-65)	sqm	164.70
	iii Polymer Modified Bitumen	sqm	153.30
	iv Crumb Rubber Modified Bitumen	sqm	158.60
	Case - II By Mechanical Means		
	i Bitumen (S-90)	sqm	132.80
	ii Bitumen (S-65)	sqm	134.40
	iii Polymer Modified Bitumen	sqm	123.10
	iv Crumb Rubber Modified Bitumen	sqm	128.90

Item No.	Description	Unit	Rate
5.10	**20mm thick Open-Graded Premix Carpet using Bitumen Emulsion as per Technical Specification clause 508.2**	sqm	125.00
	Providing, laying and rolling of open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 80-100 kN static roller capacity, finished to required level and grades to be followed by seal coat of either Type A or Type B or Type C as per Technical Specification Clause 508.		
	ii Using Cold mix Binder (Tailor made as per IRC:SP:100-2014)	sqm	161.00
5.11	**Mix Seal Surfacing**		
	Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.9 mm (Type-A) or 13.2 mm to 0.9 mm (Type-B) aggregates using penetration grade bitumen to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 8-10 kN static roller and finishing to required level and grades as per Technical Specification Clause 509		
	By Manual Means		
	Type A		
	i Bitumen (S-90)	sqm	218.30
	ii Bitumen (S-65)	sqm	220.70
	iii Polymer Modified Bitumen	sqm	203.60
	iv Crumb Rubber Modified Bitumen	sqm	212.40
	v Using Cold mix Binder (Tailor made as per IRC:SP:100-2014)	sqm	227.40
	Type B		
	i Bitumen (S-90)	sqm	205.20
	ii Bitumen (S-65)	sqm	207.30
	iii Polymer Modified Bitumen	sqm	192.50
	iv Crumb Rubber Modified Bitumen	sqm	200.10
	v Using Cold mix Binder (Tailor made as per IRC:SP:100-2014)	sqm	213.10
	By Mechanical Means		
	Type A		
	i Bitumen (S-90)	sqm	165.50

Item No.	Description	Unit	Rate
	ii Bitumen (S-65)	sqm	167.90
	iii Polymer Modified Bitumen	sqm	150.80
	iv Crumb Rubber Modified Bitumen	sqm	159.60
	0		
	Type B		
	i Bitumen (S-90)	sqm	152.50
	ii Bitumen (S-65)	sqm	154.50
	iii Polymer Modified Bitumen	sqm	139.70
	iv Crumb Rubber Modified Bitumen	sqm	147.30
5.12	**Seal Coat**		
	Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A, Type B and Type C as per Technical Specification Clause 510		
	A By Manual Means		
	Case - I : Type A		
	i Bitumen (S-90)	sqm	68.00
	ii Bitumen (S-65)	sqm	69.00
	iii Polymer Modified Bitumen	sqm	61.40
	iv Crumb Rubber Modified Bitumen	sqm	65.30
	Case - II : Type B		
	i Bitumen (S-90)	sqm	50.10
	ii Bitumen (S-65)	sqm	50.30
	iii Polymer Modified Bitumen	sqm	45.00
	iv Crumb Rubber Modified Bitumen	sqm	52.80
	Case - III : Type C		
	i Bitumen (S-90)	sqm	60.60
	ii Bitumen (S-65)	sqm	61.30
	iii Polymer Modified Bitumen	sqm	55.90
	iv Crumb Rubber Modified Bitumen	sqm	58.80
	B. By Mechanical Means		

Item No.	Description	Unit	Rate
	Case - I : Type A		
	i Bitumen (S-90)	sqm	64.80
	ii Bitumen (S-65)	sqm	65.80
	iii Polymer Modified Bitumen	sqm	58.20
	iv Crumb Rubber Modified Bitumen	sqm	62.10
	Case - II : Type B		
	i Bitumen (S-90)	sqm	42.30
	ii Bitumen (S-65)	sqm	43.00
	iii Polymer Modified Bitumen	sqm	37.70
	iv Crumb Rubber Modified Bitumen	sqm	42.90
	Case - III : Type C		
	i Bitumen (S-90)	sqm	53.40
	ii Bitumen (S-65)	sqm	54.10
	iii Polymer Modified Bitumen	sqm	49.00
	iv Crumb Rubber Modified Bitumen	sqm	51.60
	Competitive market rates to be ascertained. Alternatively, rates for stone crushing given in Chapter 1 may be adopted, if found economical. In case for supply of aggregates at site are not available, nearest crusher site may be ascertained. Loading and unloading charges and cost of carriage may be added to these rates to arrive at the cost at site.		

Chapter-6
CEMENT CONCRETE PAVEMENT

Preamble:

1 Use of Cement concrete pavement for rural roads is likely to be limited to small stretches.These will ,therfore, have to be constructed without use of heavy equipment,like,high capacity batching/ mixing plant and slip form pavers.Accordingly,the rate analysis is based on concrete mixer of suitanle capacity with weigh batcher,fixed side forms and screed,plate and needle vibrators.

2 Provision of plasticizer admixture to improve workability with reduced water cement ratio has been made.

3 The rates of materials taken in the analysis are at site.The concrete mixture placement is also assured close to the site of work so that transporting and placement of concrete can be done by labour alone.

4 The rates of earthwork ,subgrade and sub-base may be adopted from chapters-3and 4 as appropriate.

5 A Carriage cost of 50Km has been provided in the analysis for the items Interlocking Concrete Block pavement and Edge Block.

Chapter 6
CEMENT CONCRETE PAVEMENT

Item No.	Description	Unit	Rate
6.1	Granual Sub-base with will graded material (Table 400.1)		
	i Grading I material		1544.80
	ii Grading II material		1466.00
	iii Grading III material		1373.60
6.2	Lime Treated Soil	cum	584.50
6.3	Water Bound Macadam (WBM) - Sub-base		
	(A) By Manual Means	cum	2580.30
	(B) By Mechnical Means	cum	2625.50
6.4	**Cement concrete pavement**		
	Construction of un reinforced, dowel jointed at expansion and construction joint only,plain cement concrete pavement, thickness as per design,over a prepared sub base,with 43 grade cement or any other type as per clause 1501.2.2 M30 grade ,coarse and fine aggregrette conforming to is:383,maximum size of coarse aggregate not exceeding 25 mm,mixed in a concrete mixer of not less than 0.2 cum capacity and appropriate weigh batcher using approved mix design, laid in approved fixed side formwork (steel channel,laying and fixing of 125 micron thick polythene film,wedges,steel plates including levelling the formwork as per drawing) spreading the concrete with shovels,rakes,compacted using needle,screed and plate vibrator and finished in continuous operation including provision of contraction and expansion,construction joints,applying debonding strips,primer,sealant,dowelbars,near approaches to bridge/culverts and construction joints,admixture as approved,curingof concrete slabs for 14 days.	cum	6,150.20
6.5	**Roller Compacted Concrete Pavement**		
	Construction of Roller Compacted Concrete Pavement (RCCP) with coarse and fine aggregates conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum aggregate cement ratio of 5:1 mm and with minimum cemnt content of 310 kg per cum, aggregate gradation to be as per Table 602.2 after blending, mixing in concrete mixer at optimum moisture content, transporting to site, laying with wheel barrows or steel pans or with mechanical paver, compacting with 80-100 kN smooth wheel, tandem vibratory roller, to achieve, the designed flexural strength, finishing and curing as per drawings and Technical Specification Clause 1502 Note: Carraige of c.c block to site of is payable seperately as per chapter of carriage of materials from manufacturing site to the site of work	cum	5,453.80

Item No.	Description	Unit	Rate
6.6	**Rectangular Concrete Block Pavement**		
	Manufacturing, laying of cement concrete blocks of size 0.450 m x 0.300 m x 0.15 m of Cement Concrete (C.C.) M30 garde and spreading 25 mm thick sand under neath and filling joints with sand on existing W.B.M. base as per Technical Specification Clause 1503.	sqm	1,987.90
6.7	**Inter locking concrete Block pavement**		
	(A) Interlocking pavement block		
	i Providing and laying interlocking concrete block pavement (M40) having thickness 80mm as per technical specification clause 1504 complete including carriage.		
	a) Including Edge block/ Edge restraints	sqm	918.70
	b) Excluding Edge block/ Edge restraints	sqm	723.60
	ii Providing and laying interlocking concrete block pavement (M40) having thickness 60mm as per technical specification clause 1504 complete including carriage.		
	a) Including Edge block/ Edge restraints	sqm	743.50
	b) Excluding Edge block/ Edge restraints	sqm	548.40
	(B) Interlocking Edge block/ Edge restraints		
	i Providing and laying Concrete Edge block/ Edge restraints (M40 Grade) of size 300mm x 300mm x 150mm including carriage complete as per Technical specification clause 1504.	no	109.50
	Note: i. The rates for sub-grade, sub-base course to be measured and paid separately (as per Chapter 3 & 4)		

Chapter – 7
CAUSEWAY AND SUBMERSIBLE BRIDGES

Preamble:

1 The quantities of various items may be worked out from the design and drawings.

2 Rate analysis of various items involved in the construction of concrete causeway may be taken from relevant Chapters.

3 RCC Hume Pipes of NP-3 and NP-4 (non-pressure types) have been considered in the analysis.

4 Rate analysis for items of submersible bridges may be based on the respective items of Chapters 11, 12 and 13 dealing with bridges. Rates for guide posts may be taken from Chapter 8.

5 Rate analysis of item of river training and protection works may be based on the respective items in Chapter 14 (Protection Works).

Chapter 7
CAUSEWAY AND SUBMERSIBLE BRIDGES

Item No.	Description	Unit	Rate
7.1	Construction of Cut-off Walls/Head Walls		
	i Earthwork in excavation for structures as per drawing and technical specification Clause 305.		
	Rate as per item No.11.1 of Chapter 11	cum	
	ii Plain cement concrete M15 grade		
	Rate as per item No.11.4 (ii) of Chapter 11	cum	
	iii Brick masonry in cement mortar 1:4		
	Rate as per item No.11.5 (ii) of Chapter 11	cum	
	iv Stone masonry in cement mortar 1:4		
	Rate as per item No.11.6 (ii) of Chapter 11	cum	
	v Providing P.C.C M20 architectural coping on top of wall		
	Rate as per item No.12.13 of Chapter 12	m	
7.2	Preparation of Subgrade		
	Rate as per item No.3.15 of Chapter 3	cum	
7.3	Granular Sub-base		
	Rate as per item No.4.1 of Chapter 4	cum	
7.4	W.B.M. Base Course		
	Rate as per item No.4.7 of Chapter 4	cum	
7.5	Cement Concrete Slab		
	Rate as per item No.6.4 of Chapter 6	cum	6,150.20
7.6	**Providing and Laying Apron with Stone Boulders as per Drawings & Technical Specification Clause 1301**		
	Rate as per item No.14.1 of Chapter 14	cum	
	ii Providing and Laying of Boulder Apron Laid in Wire Crates as per Drawing and Technnical Specification Clause 1301		
	Rate as per item No.14.2 of Chapter 14	cum	
	iii Providing and Laying of Apron with Cement Concrete Blocks as per Drawing and Technical Specification Clause 1301		
	Rate as per item No.14.3 of Chapter 14	cum	

Item No.	Description	Unit	Rate
7.7	**Guide Posts**		
	Construction of R.C.C. guide posts of 250 mm dia, M25 grade as per drawing and technical specification Clause 1401.6		
	Rate as per item No.8.8 of Chapter 8	cum	
7.8	**Bedding for Causeway**		
	i Type A (concrete cradle) Bedding Clause 1402.5		
	As per item No.9.2 of Chapter 9	cum	
	ii Type B (first class) Bedding Clause 1402.5		
	As per item No.9.2 of Chapter 9	cum	
7.9	**Laying Reinforced Cement Concrete Pipe NP3 as per drawing and technical specification Clause 1402.6**		
	As per item No.9.3 of Chapter 9	m	
7.10	Laying Reinforced Cement Concrete Pipe NP4 as per technical specification Clause 1402.6		
	As per item No.9.4 of Chapter 9	m	

Chapter – 8
HILL ROADS

Preamble:

1 The Chapter covers only the analysis of rates for items which are peculiar to hill roads. For other items, reference may be made to relevant Chapters and analysis modified as suggested in note 2 below.

2 Extra Provision for High Altitude Areas

Since there is no place at an altitude of 2100 m and above in Assam extra provision for man power as well as machines are not considered.

Chapter 8
HILL ROADS

Item No.	Description	Unit	Rate
8.1	Site Clearance		
8.2	Setting Out		
	1) Construction of reference pillars as per Fig. 1600.1 (b) as per drawing and Technical Specification Clause 1602.1	per Km	5,879.20
	2) Construction of back piller as per Fig. 1600.1(c) as per drawing and Technical Specification Clause 1602.3	per Km	13,985.80
	3) Construction of Job pillers as per Fig. 1600.1 (d) and Technical Specification Clause 1602.4	each	550.50
8.3	Earthwork in Hill Road		
	i Excavation in Hilly Areas in Soil by manual means.		
	A) Excavation in soil in Hilly Area by manual means including cutting and trimming of side slopes and disposing of excavated earth with a lift upto 1.5 m and a lead upto 20 m as per drawing and Technical Specification Clause 1603.1 (Manual means should be use where machines can not be deployed due to site condition)	cum	145.60
	B) Extra for Every Additional Lift of 1.5 m or Part thereof	cum	15.10
	ii Excavation in Hilly Areas in Soil by mechanical means		
	A) Excavation in soil in Hilly Area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with a lift upto 1.5 m and a lead upto 20 m as per Technical Specification Clause 1603.1	cum	94.80
	B) Extra for Every Additional Lift of 1.5 m or Part thereof	cum	15.10
	iii) Excavation in Hilly Area in Ordinary Rock by manual means		
	A) Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with a lift upto 1.5 m and lead upto 20 m as per Clause 1603.2. (Manual means should be use where machines can not be deployed due to site condition)	cum	320.30
	B) Extra for Every Additional Lift of 1.5 m or Part thereof	cum	23.70
	iv Excavation in Hilly Areas in Ordinary Rock by mechanical means not requiring blasting		
	A) Excavation in hilly area in ordinary rock not requiring blasting by mechanical means including cutting and trimming of slopes and disposal of cut material with a lift upto 1.5 m and lead upto 20 m as per Clause 1603.2.	cum	146.80

Item No.	Description	Unit	Rate
	v Excavation in Hilly Areas in Hard Rock requiring blasting		
	A) Excavation in hilly areas in hard rock requiring blasting, by mechanical means, lift upto 1.5 m and disposal of excavated rock upto a lead of 20 m as per Clause 1603.2.	cum	323.20
	B) Extra for Every Additional Lift of 1.5 m or Part thereof	cum	29.70
	vi Excavation in Hard Rock (blasting prohibited)		
	Excavation for roadway in hard rock (blasting prohibited) with rock breakers including breaking rock, loading in tippers and disposal with a lift upto 1.5 m and lead upto 200 metres, trimming bottom and side slopes in accordance with requirements of lines, grades and cross- sections as per Technical Specification Clause 302.3.5		
	a) Manual Means	cum	830.00
	b) Mechanical Means	cum	496.20
8.4	Retaining Walls / Breast Walls		
	Construction of retaining walls/breast walls in cement mortar 1:5 as per drawing and technical specifications Clause 1604		
	i Earthwork in excavation for structures		
	Rate as per item No.11.1 of Chapter 11	cum	
	ii Plain cement concrete M 10 grade		
	Rate as per item No.11.4 of Chapter 11	cum	
	iii Stone masonry in cement mortar 1:5		
	Rate as per item No. 12.4 (III) (iii) of Chapter 12	cum	
	iv Pointing with cement mortar 1:3		
	Rate as per item No.12.2 of Chapter 12	sqm	
	v Providing P.C.C. M 20 architectural coping on top of retaining wall/breast wall		
	Rate as per item No.12.13 of Chapter 12	m	
	vi Filter material behind retaining wall / breast wall as per Specification 1204.3.8 in a width of 600 m		
	Rate as per item No. 12.11 of Chapter 12	cum	
	vii Back filling behind retaining wall/breast wall		
	Rate as per item No. 12.10 of Chapter 12	cum	
	0		

Item No.	Description	Unit	Rate
8.5	Construction of Hill side Drain		
	0		
	Construction of Hill side drain in accordance with the requrement of specification true to lines and grades. Dimensions and other particulars as per drawing and technical specification. Clause 1606.1		
	i Earthwork in excavation for structures as per drawing and technical specification.		
	Rate as per item no 11.1 of chapter 11	cum	
	ii Plain cement concrete M10 grade		
	Rate as per item no 11.4of chapter 11	cum	
	iii Stone masonary in cement morter 1:5		
	Rate as per item no 12.4(iii) (iii) of chapter 12	cum	
	iv Plain cement concrete M15 grade		
	Rate as per item 11.4 of chapter 11	cum	
	v Cement plaster 15 mm thick 1:4 on stone masonary		
	Rate as per item no 12.3 of chapter 12	cum	
	vi Providing P.C.C. M 20 Architectural coping on top of wall		
	Rate as per item no.12.13 of chapter 12	cum	
	Rate per m length (I+II+III+IV+V+VI)	m	
	Note: 0		
	1. Quantities of material/work shall be as per Design and Drawing.		
	0		
	2. Earth work in excavation may be taken as per site conditions.		
	It may coprise of a number of sub-items depending upon the		
	typy of soil/rock.		
	0		
8.6	Construction of catch water/Intercepting drain.		
	0		
	Construction of catch water/Intercepting drain in Random ruble masonary in 1:5 cement morter true to the specified lines grades lavel and dimensions as per the requirements of the specification Clause 1606.2		

Item No.	Description	Unit	Rate
	Unit=1M		
	0		
	i Earthwork in excavation for structure as per drawing and technical specificatuion		
	Rate as per item no 11.2 of chapter 11	cum	
	0		
	ii Plain cement concrete M10 grade		
	Rate as per 11.4 of chapter 11.	cum	
	iii Stone masonary in cement morter 1:5		
	Rateas per item no 12.4 (III) (iii) of chapter 12	cum	
	iv Plain cement cioncrete M 15 grade		
	Rate as per 11.4 of chapter 11.	cum	
	v Cement plaster 15 mm thick 1:4 on stone masonary		
	Rate as per 12.3 of chapter 12.	sqm	
	vi Providing P.C.C. M20 architectural coping on top of wall		
	Rate as per item No. 12.3 of chapter 12	cum	
	0		
	Note: 1. Quantities of material/work shall beas per design and drawings.		
	2. Earth work in excavation may be taken as per site condition.It may comprise of a number of sub-items depending upon the type of soil/rock encountered.		
	0		
8.7	Construction of Scupper		
	Construction of scupper with dry stone masonry as per drawing and technical specifications as per Clause 1606.5.	Running m	30,257.00
8.8	**Construction of RCC guide posts of 250 mm dia M15 grade cast-in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC posts not to exceed 1 in 500 as per drawing and Technical Specification Clause 1608.2**		
	i Earth work in excavation for structures		
	Rates as per item No. 11.1 of Chapter 11	cum	
	ii RCC M15 grade		
	Rate as per item No. 11.4 of Chapter 11	cum	

Item No.	Description	Unit	Rate
	iii HYSD steel bars		
	Rate as per item No. 12.6 of Chapter 12	t	
	iv Painting two coats including prime coat on new concrete surface		
	Rate as per item No.10.5 of Chapter 10	sqm	
8.9	Providing edge stones on valley side of formation as per drawing and Technical Specification Clause 1608.2.6	m	263.30
8.10	Turfing with Sods		
	Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the Engineer including preparation of ground, stacking the sods and watering as per Clause 309	sqm	20.90
8.11	Seeding and Mulching		
	Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, multching material, applying bituminous emulsion at the rate of 0.23 l per sqm and laying and fixing jute netting, including watering for 3 months all as per Clause 310.	sqm	271.10

Chapter – 9
PIPE CULVERTS

Preamble:

1 Pipe culverts of sizes 750 mm, 1000 mm and 1200 mm dia in single row and double row which are generally used on roads, have been included. Providing and laying of pipe has been included in the rate analysis. Items of auxiliary works such as excavation, bedding, backfilling, concrete and masonry shall be analysed, as provided under the respective sections and paid for separately.

2 Analysis has been given separately for NP3 and NP4 pipes for ease of adoption.

3 Cost of any river training and protection work like stone pitching, apron, curtain wall etc. may be analysed under the respective item included in Chapter 14.

4 The joining of pipes is proposed by collar joints.

5 Chain & pulley for lifting the pipes is considered part of overheads.

6 The thickness of first class bedding has been taken as 150 mm. The height of bedding has been taken as 1 of overall height of pipe in the analysis. This may be modified as per thickness indicated in the approved drawing.

Chapter 9
PIPE CULVERTS

Item No.	Description	Unit	Rate
9.1	Excavation for Structures		
	Earthwork in excavation for foundation of structures upto 3 m depth as per drawing and technical specification Clause 1104 includding setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.	cum	102.00
9.2	**Bedding of pipe**		
	(A) Type A (Concrete Cradle) Bedding		
	i Laying concrete cradle bedding with M15 Grade Cement Concrete as per Clause 1105 (i)		
	Rate as per Item No.11.4 (II)(i) of Chapter 11	cum	5,085.60
	(B) Type B (First Class) Bedding		
	Laying (First Class) bedding on well compacted sand, moorum as per Clause 1105 (ii)		
	i Laying (First Class) bedding on well compacted sand, moorum as per Clause 1105 (ii)	cum	1,129.00
	ii Laying (First Class) bedding on well compacted approved granular material as per Clause 1105 (ii)	cum	1,369.05
	0		
9.3	Providing and Laying Reinforced Cement Concrete Pipe NP3 as per design in Single Row		
	Providing and laying reinforced cement concrete pipe NP3 for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets Clause 1106.		
	1200 mm dia	m	9,864.70
	1000 mm dia	m	6,880.50
	600 mm dia	m	2,886.80
9.4	Providing and Laying Reinforced Cement Concrete Pipe NP4 as per design in Single Row		
	Providing and laying reinforced cement concrete pipe NP4 for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding		

Item No.	Description	Unit	Rate
	excavation, protection works, backfilling, concrete and masonry works in head walls and parapets Clause 1106.		
	1200 mm dia m	m	11,889.70
9.5	Providing and Laying Reinforced Cement Concrete Pipe NP3 as per Design in Double Row		
	Providing and laying reinforced cement concrete pipe NP3 for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets as per Clause 1106.		
	A) 1200 mm dia	m	19,791.60
	B) 1000 mm dia	m	14,560.10
9.6	Providing and Laying Reinforced Cement Concrete Pipe NP4 as per Design in Double Row		
	Providing and laying reinforced cement concrete pipe NP4 for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets as per Clause 1106.		
	A) 1200 mm dia	m	23,841.60
	B) 1000 mm dia	m	19,597.90
9.7	Plain Cement Concrete M10 (1:3:6 nominal mix) in levelling course below open foundation of Head walls as per drawings & Technical Specification Clause 1109	cum	5216.60
9.8	Brick Masonry Work in cement mortar in foundation of Head walls complete exculding pointing and plastering as per drawing and technical specification Clause 1109		
	A Brick Masonry in 1:4 cement mortar	cum	6464.40
	B In cement-lime mortar (1:0.5:4.5)	cum	6375.20
9.9	Stone Masonry Work in cement mortar in foundation of Head walls complete as per drawing and technical specification Clasue 1109		
	A In 1:4 cement mortar	cum	3786.30
	B In cement-lime mortar (1:0.5:4.5)	cum	3630.10
9.10	**Pointing with Cement Mortar (1:3) on brickwork as per technical specification Clause 613.3**	10 sqm	583.50
9.11	**Plastering with Cement Mortar (1:4), 15 mm thick on brickwork in substructure as per technical specification**	10 sqm	1211.70

Item No.	Description	Unit	Rate
9.12	**Backfilling in Foundation Trenches as per drawing and technical specification Clause 1108**	cum	1411.80
9.13	**Providing PCC M20 Architectural Coping on the top of wing wall, return wall etc. complete as per drawing and technical specification Clause 615**	m	895.10

Chapter–10
TRAFFIC SIGNS, MARKINGS AND OTHER APPURTENANCES

Preamble:

1 Rate analysis for fencing provides for Barbed wire fencing with R.C.C. M 15 grade concrete post.

2 Backfilling of foundation of boundary pillars has been proposed with stone spalls, tightly packed and compacted.

3 The item pertaining to road traffic signals has not been analysed as this is a specialized work and rates can be obtained from firms having specialisation for design and installation of this work.

4 Two supports have been provided for direction and place identification signs where size is more than 0.9 square metres. Only one support is provided for size upto 0.9 square metres.

5 The traffic signs proposed are of retro-reflectorised types made of encapsulated lens type reflective sheeting fixed over aluminum sheeting and semi-reflective type on M.S. sheet.

6 The size and location of traffic signs shall be as per IRC:67.

7 Separate rate analysis has been made for tubular steel railing with RCC posts and MS steel posts.

Chapter 10
TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES

Item No.	Description	Unit	Rate
10.1	Printing New Letters and Figures of any Shade		
	Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade as per drawings and Technical Specification Clause 1701		
	i Hindi (Matras commas and the like not to be measured and paid for. Half letters shall be counted as half only)	per cm height per letter	0.92
	ii English and Roman	per cm height per letter	0.59
10.2	Traffic Signs		
	A Retro-reflectorised Traffic Signs		
	I Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3 fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per drawings and Technical Specification Clause 801		
	i 900mm equilateral triangle	each	5,541.40
	ii 600mm equilateral triangle	each	3,723.40
	iii 600mm circular	each	4,913.60
	iv 800mm x 600mm rectangular	each	6,759.70
	v 600mm x 450mm rectangular	each	4,791.70
	vi 600mm x 600mm square	each	5,635.10
	vii 900mm side octagon	each	8,559.00
	II Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 1.5 mm thick supported on GI pipe 50 mm dia firmly fixed to the ground by means of properly designed foundation with M-15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per drawings and Technical Specification Clause 1701		
	i 900mm equilateral triangle	each	5,607.50

Item No.		Description	Unit	Rate
	ii	600mm equilateral triangle	each	3,789.50
	iii	600mm circular	each	4,979.60
	iv	800mm x 600mm rectangular	each	6,825.80
	v	600mm x 450mm rectangular	each	4,857.80
	vi	600mm x 600mm square	each	5,701.20
	vii	900mm side octagon	each	9,562.20
	III	Providing and fixing of retro-reflectorised cautionary, mandatory and informatory sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 1.5 mm thick supported on RCC Post 100 mm x 100 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per approved drawing Clause 1701		
	i	900mm equilateral triangle	each	4,755.40
	ii	600mm equilateral triangle	each	2,937.30
	iii	600mm circular	each	4,127.50
	iv	800mm x 600mm rectangular	each	5,973.60
	v	600mm x 450mm rectangular	each	4,005.70
	vi	600mm x 600mm square	each	4,849.10
	vii	900mm side octagon	each	7,772.90
		Please ensure that area of aluminium plate of required size is entered in the analysis item		
	(B)	Semi Reflective Traffic Signs		
	I	Providing and fixing of semi reflective cautionary, mandatory and informatory sign board as per IRC:67 made of 1.5 mm thick MS Sheet duly stove white colour in front and gray colour on back with red reflective border of 65 mm width and required letters and figures with reflective tape engineering grade as per Clause 1701.3.9 of MORD for Rural Roads of required shade and colour supported and welded on 47mm x 47 mm x 12 SWG sheet tube firmly fixed to the ground by mean of properly designed foundations with M-15 grade cement concrete 450x450x600 mm, 600 mm below ground level as per approved drawing Clause 1701.2.2		
	i	900mm equilateral triangle	each	4,265.00
	ii	600mm equilateral triangle	each	2,957.20

Item No.	Description		Unit	Rate
	iii	600mm circular	each	3,813.30
	iv	800mm x 600mm rectangular	each	5,141.30
	v	600mm x 450mm rectangular	each	3,725.70
	vi	600mm x 600mm square	each	4,332.40
	vii	900mm side octagon	each	7,109.70
10.3	Direction and Place Identification signs upto 0.9 sqm size board			
	A	Retro-reflectorised Traffic Signs		
	i	Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M-15 grade cement concrete 450 x 450 x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701	sqm	12,165.20
	ii	Providing and erecting direction and place identification retro- reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on 2 inch dia GI Pipe firmly fixed to the ground by means of properly designed foundation with M-15 grade cement concrete 450 x 450 x 600 mm, 600 mm below ground level as per approved drawing and Tehnical Specification Clause 1701.	sqm	11,231.20
	iii	Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on RCC Post 100 mm x 100 mm firmly fixed to the ground by means of properly designed foundation with M-15 grade cement concrete 450 x 450 x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701	sqm	10,985.70
	B	Semi-Reflective Traffic signs		
		Direction and place indentification signs up to 0.9 sqm size board		
	i	Providing and erecting direction and place identifications of semi reflective sign boards as per IRC:67 made of 2 mm thick M.S. Sheet duly stove enameled paint in white colour in front and grey colour on back with red reflective border of 70 mm width and required message, letters, figures with reflective	sqm	8,591.40

Item No.	Description	Unit	Rate
	engineering grade tape as per MORD specifications of required shade and colour. Supported and welded on 47 mm x 47mm of 12 SWG Square tube of 3050 mm height duly strengthened by 25 mm x 5 mm M/s flat iron on edges on back firmly fixed to the ground by means of properly designed foundations with M-15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701		
10.4	Direction and Place Identification signs with size more than 0.9 sqm size board		
	A Retro-reflectorised Traffic Signs		
	i Providing and erecting direction and place identification retro-\reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on mild steel angle iron posts 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M-15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701	sqm	12,655.40
	ii Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on dia GI Pipe firmly fixed to the ground by means of properly designed foundation with M-15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701	sqm	12,754.00
	iii Providing and erecting direction and place identification retro- reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide Clause 1701.2.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on RCC Posts 100 mm x 100 mm firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701	sqm	11,302.50
	B Semi-Reflective Traffic Signs		
	Direction and place identification signs more than 0.90 sqm sign board		
	Providing and erecting direction and place identification of semi reflective sign boards as per IRC-67 made of 2 mm thick M.S. Sheet duly stove enameled paint white colour in front	sqm	9,723.80

Item No.	Description	Unit	Rate
	and grey colour on back with reflective border of 70 mm width and required message, letters, figures with reflective tape of engineering grade as per MORD specifications of required shade and colour. Supported and welded on two nos. 47 mm x 47 mm of 12 SWG square tube of 3050 mm height duly strengthened by 25 mm x 5 mm MS flat iron on edges on back firmly fixed to the ground by means of properly designed foundations with M-15 grade cement concrete 450 mm x 450 mm x 600 mm, 600 mm below ground level as per approved drawing and Technical Specification Clause 1701		
10.5	Painting Two Coats on New Concrete Surfaces		
	Painting two coats including primer coat after filling the surface with synthetic enamel paint in all shades on new, plastered / concrete surfaces as per drawing and Technical Specification Clause 1701	sqm	65.40
10.6	Painting on Steel Surfaces Providing and applying two coats of ready mix paint including primer coat of approved brand on steel surface after through cleaning of surface to give an even shade as per drawing and Technical Specification Clause 1701	sqm	66.90
10.7	Painting on Concrete/Steel Surfaces with Epoxy		
	Painting two coats including prime coat with epoxy paint of approved brand on concrete/steel surfaces after through cleaning of surface to give an even shade as per drawing and Technical Specification Clause 1701	sqm	121.50
10.8	Painting lines, Dashes, Arrows, etc. on Road in Two Coats on New Work		
	Painting lines, dashes, arrows, etc. on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous/concrete surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per drawing and Technical Specification Clause 1702	sqm	78.50
10.9	Painting lines, Dashes, Arrows, etc. on Roads in Two Coats on Old Work		
	Painting lines, dashes, arrows, etc. on roads in two coats on old work with ready mixed road marking paint conforming to IS:164 on bituminous/concrete surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per drawing and technical specification Clause 1702	sqm	61.40
10.10	Kilometre Stone		
	Reinforced cement concrete M15 grade kilometre stone/local stone of standard design as per IRC:8 fixing in position including painting		

Item No.	Description	Unit	Rate
	and printing, etc as per drawing and Technical Specification Clause 1703		
	i) 5th Kilometre Stone (precast)	each	3,524.80
	ii) Ordinary Kilometer Stone (Precast)	each	2,116.40
	iii) 200 m stone (precast)	each	563.20
10.11	Boundary Pillar		
	Reinforced cement concrete M15 grade boundary pillars/local stone of standard design as per IRC:25, fixed in position including finishing and lettering but excluding painting as per drawing and Technical Specification Clause 1704	each	605.40
10.12	G.I Barbed Wire Fencing 1.2 m high		
	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 centre-to-centre founded in M15 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 Clause 1705.	Running m	243.90
10.13	G.I Barbed Wire Fencing 1.8 m high		
	Providing and fixing 1.8 m high GI barbed wire fencing with 2.4 m RCC M15 grade 150 mm x 150 mm concrete post placed every 3 m centre-to-centre founded in M15 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 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc. complete as per Clause 1705.	Running m	404.80
10.14	Tubular Steel Railing on Medium Weight Steel Channel (ISMC series) 100 mm x 50 mm		
	Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 m high above ground, 2 m centre-to-centre, complete as per approved drawings Clause 1706	Running m	1,581.50
10.15	Tubular Steel Railing on Precast RCC posts, 1.2 m high above Ground Level		
	Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M-20 grade RCC vertical posts 175 mm x 175 mm x 1.8 m high (1.2 m above GI) with 3 holes 50 mm dia for pipe, fixed 2 m centre-to- centre complete as per approved drawings Clause 1706	Running m	1163.80

Item No.	Description	Unit	Rate
10.16	Providing and Fixing 'Logo' of PMGSY Project		
	Providing and fixing of typical PMGSY informatory sign board with Logo as per MORD specifications and drawing. Three MS Plates of 1.6 mm thick, top and middle plate duly welded with MS flat iron 25mm x 5m size on back on edges. The lower plate will be welded with MS angle iron frame of 25mm x 25mm x 5mm. The angle iron frame of the lower most plate and flat iron frame of middle plate will be welded to 2 nos. 75mm x 75 mm of 12 SWG sheet tubes posts duly embedded in cement concrete M-15 grade blocks of 450mm x 450mm x 600mm, 600mm below ground level. The top most diamond plate will be welded to middle plate by 47mm x 47mm of 12 SWG steel plate tube. All M.S. will be stove enameled on both sides. Lettering and printing arrows, border etc. will be painted with ready mixed synthetic enamel paint of superior quality in required shade and colour. All sections of framed posts and steel tube will be painted with primer and two coats of epoxy paint as per drawing Clause 1701 and Annexure 1700.1	each	21,457.90
10.17	Traffic Cone		
	Provision of red fluorescent with white reflective sleeve traffic cone made of Low Density Polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS:873	each	1,344.80
10.18	Rumble Strips		
	Provision of 15 n0s.rumble strips covered with premix bituminous carpet,15.2 mm high at centre,250mm wide placed at 1m centre to centre at approved location to control speed, marked with white strips of road marking paint.		
	The rate per sqm of premix carpet and road marking may be adopted from Chapters 5&10 respectively for the quantities calculated from approved drawings.		
10.19	Safety Device and sign in Construction Zones		
	Provision and fixing of traffic sign for limited period at a suitable location in construction zone comprising of warning zone,approach transition zone,working zoneand terminal transition zone with a minimunm distance of 2-3 m from the edgeof the carraige way.The bottom edge of the lowest sign plate to be not less than 2 M above the road level, fixed on 600mx600mx6mm angle iron post,founded and installed as per approved design and drawings,removed and disposed ofafter completion of construction work, all as per IRC:SP 55-2001		
	Following types of signs are required to be fixed in construction zones for safety of traffic.		
	a) Diversion one km ahead		

Item No.	Description	Unit	Rate
	b) Traffic sign ahead		
	c) Road ahead closed		
	d) Men at work		
	e) Road narrow		
	f) Un even road		
	g) Slipery road		
	h) Loose chipping		
	I) Diversion		
	J) Do not enter		
	k) Road closed		
	l) Stop		
	k) Slow		
	Speed limit		
	Note: The rate for traffic signs are already worked out and given elsewhere in this chapter.The same may be adopted		
10.20	Road Markers/Road Stud with Lens Reflector		
	Providing and fixing of road stud 100 x 100 mm die cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling holes 30 mm upto a depth of 600 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS:873 (Part 4) 1973.	each	547.80

PART-B

BRIDGE WORKS

Chapter – 11
FOUNDATION

Preamble:

1 Excavation for structures has been provided by and large by manual means.

2 The earth excavated from foundation has been proposed to be backfilled in the foundation trenches except for marshy soil where disposal has been provided.

3 For excavation in marshy soil, extra provision of labour for filling with carted earth has been provided in a separate item. Cost of carted earth may be worked out separately if the same is not available from the adjoining area.

4 The rock surface for foundations is to be prepared which has been analysed accordingly.

5 In case of rock, excavation has been considered upto a depth of 1500 mm for rock of ultimate crushing strength of 10 Mpa or more, which shall be reckoned as hard rock.

6 Dewatering has been provided in excavation for foundation on percentage basis. In case less dewatering is required or is not required at all for a particular site condition, the same may be reduced/omitted.

7 Mixing of cement concrete has been considered by using concrete mixer with weigh batching facility fitted with water measuring device. It is preferable to use concrete mixes fitted with load cells for weigh batching.

8 In remote areas, for isolated slab culvert/box culvert upto 2 m span, concrete can be hand mixed in accordance with Clause 806 of MORD Specifications. Therefore, in the analysis, for items of concrete, the alternative of hand mixing has also been considered.

9 Steel reinforcement for cement concrete work is required to be provided separately. The rate for the same has been analysed using HYSD and TMT bars.

10 Necessary safety precautions shall be taken for excavation for open foundation for which guidance may be taken from IS:3764. Cost of shoring and shuttering has been provided on percentage basis, which may be adjusted according to site condition.

11 For brick masonry work, clay fly ash bricks of approved type can be used in accordance with Section 600 of MORD Specifications and rate may be adopted accordingly.

Chapter 11
FOUNDATION

Item No.	Description	Unit	Rate
11.1	Excavation for Structures		
	Earthwork in excavation for structures as per drawing and technical specifications Clause 305.1 including setting out, construction of shoring and bracing, removal of stumps and other deleterious material and disposal upto a lead of 50 m, dressing of sides and bottom and backfilling in trenches with excavated suitable material.		
	I Ordinary soil		
	Upto 3 m depth	cum	102.00
	3 m to 6 m depth	cum	148.30
	II Ordinary rock (not requiring blasting)		
	Upto 3 m depth	cum	163.90
	III Hard rock (requiring blasting)	cum	390.70
	IV Hard rock (blasting prohibited)	cum	386.90
	V Marshy soil	cum	465.90
11.2	Fillling in foundation trenches as per drawing and technical specification Clause 305.3.9		
	i Sand filling	cum	1,411.80
	ii Earth filling (For marshy soil)	cum	161.00
11.3	Filling annular space around footing in rock as per technical specification Clause 1203.4.3.		
	P.C.C grade M 15		
	A With crushed Stone	cum	4,844.60
	B With natural Gravel	cum	4,563.10
11.4	**Providing concrete for plain/reinforced concrete in open foundations complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203**		
	A With crushed Stone		
	I P.C.C grade M 10		
	Nominal mix 1:3:6	cum	5,216.60
	Nominal mix 1:3.6 (Hand mixing)	cum	5,240.10
	II P.C.C grade M 15		

Item No.	Description	Unit	Rate
	Nominal mix (1:2.5:5)	cum	5,085.60
	Nominal mix 1:2.5:5 (Hand mixing)	cum	5,109.10
	III P.C.C Grade M20		
	Nominal mix (1:2:4)	cum	5,756.20
	Nominal mix 1:2:4 (Hand mixed)	cum	5,779.70
	IV R.C.C Grade M20	cum	6,108.90
	V R.C.C Grade M25	cum	6,510.70
	B With natural Gravel		
	I P.C.C Grade M 10		
	Nominal mix 1:3:6	cum	4,837.00
	Nominal mix 1:3:6 (Hand mixing)	cum	4,860.60
	II P.C.C Grade M15		
	Nominal mix 1:2.5:5	cum	4,769.30
	Nominal mix 1:2.5:5 (Hand mixing)	cum	4,792.90
	III P.C.C Grade M20		
	Nominal mix (1:2:4)	cum	5,365.80
	Nominal mix 1:2:4 (Hand mixed)	cum	5,389.30
	IV R.C.C Grade M20	cum	5,648.90
	V R.C.C Grade M25	cum	6,052.20
11.5	**Brick masonry work in cement mortar in foundation complete excluding pointing and plastering as per drawing and technical specifications Clauses 600, 1202 & 1203**		
	I Brick masonry in 1:3 cement mortar	cum	6,672.80
	ii Brick masonry in 1:4 cement mortar	cum	6,464.40
	iii Brick masonry in 1:6 cement mortar	cum	6,375.20
11.6	**Stone masonry work in cement mortar in foundation complete as per drawing and technical specifications Clauses 702, 704, 1202 & 1203.**		
	I Coursed rubble masonry (1st sort)		
	In 1:3 cement mortar	cum	4,441.40
	In 1:4 cement mortar	cum	4,160.20
	in 1:6 Cement morter	cum	4,039.60

Item No.	Description	Unit	Rate
	II Coursed rubble masonry (2nd sort)		
	In 1:3 cement mortar	cum	5,159.10
	In 1:4 cement mortar	cum	3,786.30
	in 1:6 Cement morter	cum	3,630.10
	III Random Rubble Masonry		
	In 1:3 cement mortar	cum	5,670.80
	In cement mortar 1:4	cum	3,978.30
	in 1:6 Cement morter	cum	3,857.80
11.7	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar (From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/ Shyam steel/RINL) in foundation complete as per drawings and technical specifications Clauses 1000 and 1202**	t	54,969.90
11.8	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar (Other ISI approved TMT reinforcement bar (SAI/BISCON/ THERMAX or equivalent)) in foundation complete as per drawings and technical specifications Clauses 1000 and 1202**	t	47,068.50
11.9	**Supplying, fitting and placing MS Bar (Fe-500) reinforcement bar (From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/ Shyam steel/RINL) in foundation complete as per drawings and technical specifications Clauses 1000 and 1202**	t	55,930.00

Chapter – 12
SUBSTRUCTURE

Preamble:

1 The cost of formwork will vary with the height and cross-section of the substructure. Provision has been made accordingly.

2 As the higher grade of concrete is costlier, the provision made for formwork on percentage basis has been suitably adjusted to make it compatible with other grades.

3 Filter media and backfilling behind abutment are required to be provided as per guidelines in IRC:78- 2000.

4 Bearing shall be set truly level so as to have full and even seating.

5 The bearing should be procured only from those manufacturers who have been pre-qualified by MORTH.

6 For spans in gradient, the soffit shall be made horizontal specially at the supports and the bearing, where provided, shall be placed horizontally.

7 Weep holes shall be provided as per specifications.

8 For elastomeric bearings, the concrete surface shall be leveled such that the variation is not more than 1.5 mm from a straight edge placed in any direction across the area.

9 Note Nos. 7 to 12 of Chapter 11 will hold good for this Chapter also.

Chapter 12
SUBSTRUCTURE

Item No.	Description	Unit	Rate
12.1	Brick masonry work in cement mortar in substructure complete excepting pointing and plastering, as per drawing and technical specification Clauses 602, 603, 604, 1202 & 1204		
	i In 1:3 cement mortar	cum	7,137.90
	ii In 1:4 Cement mortar	cum	6,925.70
	iii In 1:5 cement mortar	cum	6,888.20
	iv In 1:6 cement mortar	cum	6,813.20
12.2	**Pointing with cement mortar (1:3) on brickwork as per drawing and technical specification Clauses 613.3 and 1204**	10 sqm	583.50
12.3	**Plastering with cement mortar (1:4), 15 mm thick on brickwork in substructure as per technical specification Clauses 613.4 & 1204**	10 sqm	1,211.70
12.4	**Stone masonry in cement mortar for substructure complete as per drawing & technical specification Clauses 702, 704, 1202 and 1204**		
	I Coursed rubble masonry (1st sort)		
	In 1:3 cement mortar	cum	4,878.00
	In 1:4 cement mortar	cum	4,582.70
	In 1:5 cement mortar	cum	4,394.10
	In 1:6 cement mortar	cum	4,309.80
	II Coursed Rubble masonry (2nd sort)		
	In 1:3 cement mortar	cum	4,859.30
	In 1:4 cement mortar	cum	4,443.70
	In 1:5 cement mortar	cum	4,384.30
	In 1:6 cement mortar	cum	4,265.50
	III Random rubble masonry		
	In 1:3 cement mortar	cum	5,414.70
	In 1:4 cement mortar	cum	4,889.80
	In 1:5 cement mortar	cum	4,814.80
	In 1:6 cement mortar	cum	4,664.80
12.5	**Plain/reinforced cement concrete in substructure complete as per drawings and technical specification Clauses 802, 804, 805, 806, 807, 1202 ans 1204**		

Item No.	Description	Unit	Rate
	A With Crushed Stone		
	I P.C.C grade M 15		
	i) Nominal mix (1:2.5:5)	cum	5,379.00
	ii) Nominal mix 1:2.5:5 (Hand mixing)	cum	5,403.90
	II P.C.C. grade M 20		
	i) Nominal mix (1:2:4)	cum	6,088.30
	ii) Nominal mix 1:2:4 (Hand mixed)	cum	6,113.20
	III RCC Grade M 20		
	i) For height upto 5 m	cum	6,461.00
	ii) For height above 5 m upto 10 m	cum	6,578.50
	IV RCC Grade M 25		
	i) For height upto 5 m	cum	6,903.00
	ii) For height above 5 m upto 10 m	cum	7,028.50
	B With Natural Gravel		
	I P.C.C grade M 15		
	i) Nominal mix (1:2.5:5)	cum	5,044.50
	ii) Nominal mix 1:2.5:5 (Hand mixing)	cum	5,069.40
	II P.C.C. grade M 20		
	i) Nominal mix (1:2:4)	cum	5,675.40
	ii) Nominal mix 1:2:4 (Hand mixed)	cum	5,700.20
	III RCC Grade M 20		
	i) For height upto 5 m	cum	5,975.00
	ii) For height above 5 m upto 10 m	cum	6,083.50
	IV RCC Grade M 25		
	i) For height upto 5 m	cum	6,417.00
	ii) For height above 5 m upto 10 m	cum	6,533.50
12.6	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar (From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/Shyam steel/RINL) in substructrue complete as per drawings and technical specification Clauses 1002, 1005, 1010 & 1202**	t	55,091.00
12.7	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar (Other ISI approved TMT reinforcement bar (SAI/BISCON/**	t	47,189.50

Item No.	Description	Unit	Rate
	THERMAX or equivalent)) in substructrue complete as per drawings and technical specification Clauses 1002, 1005, 1010 & 1202		
12.8	**Supplying, fitting and placing MS Bar (Fe-500 D) reinforcement bar(From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/ Shyam steel/RINL) in substructrue complete as per drawings and technical specification Clauses 1002, 1005, 1010 & 1202**	t	56,051.10
12.9	**Providing weepholes in brick masonry/stone masonry, plain/ reinforced concrete abutment, wing wall, return wall with 100 mm dia AC pipe extending through the full width of the structures with slope of 1(V):20(H) towards drawing face complete as per drawing and technical specification Clauses 614, 709, 1204.3.7**	Nos.	117.70
12.10	**Backfilling behind abutment, wing wall and return wall complete as per drawings & technical specification Clause 1204.3.8**		
	i Granular material	cum	1,280.40
	ii Sandy material	cum	1,576.00
12.11	**Providing and laying filter media with granular crushed aggregates as per specification to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and providing over the entire surface behind abutment, wing wall, return wall to the full height, compacted to firm condition complete as per drawing and technical specification Clause 1204.3.8**	cum	1,797.00
12.12	**Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC:83 (Part-II) Section IX complete, including all accessories as per drawings and technical specification Clause 1207.1**	cu cm	1.59
12.13	**Providing PCC M-20 architectural coping on the top of wing wall, return wall etc. complete as per drawing and technical specification Clauses 615, 710 and 1204.3.11**		
	i With Crushed stone	Running m	395.10
	ii With Natural Gravel	Running m	368.30
12.14	**Providing pressure relief pipes 100 mm dia in bottom slab of box cell on a filter media base of 500 mm x 500 mm as per drawing and technical specification Clause 1205.5.7**	Nos.	606.10

Chapter – 13
SUPERSTRUCTURE

Preamble:

1 The rate for wearing coat has been analysed as under in accordance with the provisions of MORD Specifications:

a. Bituminous type

b. Cement concrete

2 The rate analysis has been done for the following types of railings & parapet:

i. R.C.C. railing

ii. M.S. railing

iii. Pipe railing (suitable for submersible bridges)

iv. Brick masonry parapet

v. Stone masonry parapet

vi. P.C.C. parapet

3 As per the MORD Specifications, the type of superstructure envisaged for minor bridges and culverts for rural roads are R.C.C. slabs and box culverts not exceeding 15 m span, rates for which have been analysed. Stone/Brick masonry arches can be adopted where hard strata is available at shallow depth. R.C.C. arches can also be adopted as per IRC:SP:20. Hence rates for these types of arches for span length upto 15 m have been analysed.

4 For composite type of superstructure, comprising of steel beams/built-up sections & R.C.C. deck slab, analysis has been done for steel section separately.

5 For slab culverts and minor bridges of spans not more than 10 m, buried joint/filler joint may be adequate. For relatively longer spans and for highly seismic intensity areas, elastomeric slab seal/ compression seal joint may be provided as per the MORD Specifications. Rates have been analysed accordingly.

6 In remote areas, for slab culverts and box culverts upto 2 m span, concrete used in superstructure can be hand mixed with 10 per cent extra cement at contractor's cost in accordance with Clause 806 of MORD Specifications. Hand mixing shall not be otherwise permitted.

7 Slab seal/compression seal expansion joints are specialised items commercially produced by a number of firms. The rates for such items must be ascertained from firms pre-qualified by MORTH. Overheads for the above specialized manufactured items have been considered as 30 per cent instead of the usual 20 per cent for other items of bridge works.

Chapter 13
SUPERSTRUCTURE

Item No.	Description	Unit	Rate
13.1	Providing and laying reinforced cement concrete in superstructure as per drawing and technical specifications Clauses 800, 1205.4 and 1205.5		
	A With crushed stone		
	I R.C.C grade M 20		
	i For nominal mix 1:2:4		
	a) Height upto 5 M	cum	6,997.71
	b) Height from 5m to 10M	cum	7,289.28
	c) Height above 10 M	cum	7,580.85
	ii For nominal mix 1:2:4 (Hand mixed)		
	a) Height upto 5 M	cum	7,027.12
	b) Height 5m to 10M	cum	7,319.92
	c) Height above 10M	cum	7,612.71
	iii For design mix RCC M 20		
	a) Height upto 5M	cum	6,869.83
	b) Height 5Mto 10 M	cum	7,156.08
	c) Height above 10 M	cum	7,442.32
	II R.C.C grade M 25		
	a) Height upto 5M	cum	7,494.79
	b) Height from 5M to 10 M	cum	7,807.08
	c) Height above 10 M	cum	8,119.36
	III R.C.C grade M 30		
	a) Height upto 5M	cum	7,762.63
	b) Height from 5M to 10M	cum	8,086.08
	c) Height above 10M	cum	8,409.52
	B With Natural Gravel		
	I R.C.C. grade M 20		
	i For Nominal mix 1:2:4		
	a) Height upto 5M	cum	6,467.38

Item No.	Description	Unit	Rate
	b) Height from 5M to 10M	cum	6,736.86
	c) Height above 10M	cum	7,006.33
	ii Nominal mix 1:2:4 (Hand Mixed)		
	a) Height upto 5M	cum	6,496.80
	b) Height from 5M to 10M	cum	6,767.50
	c) Height above 10M	cum	7,038.20
	iii For Design mix RCC M 20		
	a) Height upto 5 M	cum	6,339.51
	b) Height from 5m to 10M	cum	6,603.66
	c) Height above 10 M	cum	6,867.80
	II R.C.C. grade M 25		
	a) Height upto 5M	cum	6,964.47
	b) Height from 5M to 10M	cum	7,254.66
	c) Height above 10M	cum	7,544.84
	III R.C.C. grade M 30		
	a) Height upto 5M	cum	7,232.31
	b) Height from 5M to 10 M	cum	7,533.66
	c) Height above 10 M	cum	7,835.00
13.2	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar . (From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/Shyam steel/RINL) in superstructure complete as per drawing and technical specifications Clauses 1002, 1010 and 1202**	t	56,316.20
13.3	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar. (Other ISI approved TMT reinforcement bar (SAI/BISCON/ THERMAX or equivalent)) in superstructure complete as per drawing and technical specifications Clauses 1002, 1010 and 1202**	t	48,414.80
13.4	**Supplying, fitting and placing MS Bar (Fe-500) reinforcement bar (From Primary Producer: TATA/SAIL/Esser Steel/ Jindal steel/Shyam steel/RINL) in superstructure complete as per drawing and technical specifications Clauses 1002, 1010 and 1202**	t	57,276.40
13.5	**Providing and laying cement concrete wearing course M 30 grade including reinforcement complete as per drawing and technical specifications Clauses 800 and 1206.3**		
	A With crushed stone	cum	12,407.50
	B With Natural Gravel	cum	11,952.30

Item No.	Description	Unit	Rate
13.6	**Construction of R.C.C. railing of M 25 grade in cast-in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical railing post not to exceed 1 in 500, centre-to-centre spacing between vertical posts not to exceed 2000 mm as per drawing and technical specifications Clauses 800, 900 and 1208.3**	Running m	2,397.00
13.7	Providing fitting and fixing mild steel railing complete as per drawing and technical specifications Clause 1208.2	Running m	3,593.70
13.8	**Providing and fixing in position pipe railing consisting of IS Rolled steel joist posts designation IS MB 100 (100x75) at 2.5 m interval and three rows of 50 mm dia steel pipes (light) including fixing in position on bridge deck complete as per drawing and technical specifications Clause 1208.2**	Running m	1,544.80
13.9	**Brick masonry work in cement mortar 1:3 in parapet excluding pointing and plastering as per drawing and technical specifications Clauses 600, 900 and 1208.4**	cum	6,716.00
13.10	**Drainage spouts complete as per drawing and technical specifications Clause 1209**	Nos.	1,640.90
13.11	**P.C.C. M 15 ordinary grade (1:2.5:5) levelling course below approach slab complete as per drawing and technical specifications Clauses 800 and 1211**		
	A With crushed stone		
	i Nominal mix (1:2.5:5)	cum	4,890.00
	ii Nominal mix 1:2.5:5 (Hand mixing)	cum	4,875.40
	B With Natural Gravel		
	i Mix (1:2.5:5)	cum	4,585.90
	ii Mix 1:2.5:5 (Hand mixed)	cum	4,571.30
13.12	Reinforced Cement Concrete M 25 grade approach slab including reinforcement and formwork complete as per drawing and technical specifications Clauses 800 and 1211		
	A With crushed stone	cum	10,310.60
	B With Natural Gravel	cum	9,780.30
13.13	**Providing and laying of an elastomeric slab seal expansion joint compleate as per approved drawing and approved specification to be installed by manufacturer/supplier or their authorised representative ensuring compliance to the manufacturers instructuion for instalation and as per technical specification clause 1207.2.5**	Running m	15,698.10
13.14	**Providing and laying of a compression seal consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or**	Running m	16,588.00

Item No.	Description	Unit	Rate
	closed cell foam joint sealer compressed and formed intothe joint gap with special adhesive binder as per drawing and technical specification Clause 1207.2.4		
13.15	**Providing and laying a buried expansion joint, covered with 12 mm thick, 200 mm wide galvanised weldable structrual steel plate as per IS:2062, placed symmetrical to centre line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia, 100 mm long galvanised nails spaced 300 mm c/c along the centre line of the plate, as per technical specifications Clauses 1207.2.3**	Running m	1,717.50
13.16	**Filler Joint**		
	i Providing and fixing 2 mm thick corrugated copper plate in expansion joint as per drawing and technical specifications Clause 1207.2.2	Running m	946.70
	ii Providing and fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing and technical specifications	Running m	254.20
	iii Providing and fixing 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans, covered with sealant complete as per drawing and technical specification.	Running m	229.30
	iv Providing and fillling joint sealing compound as per drawings and technical specifications with coarse sand and 6 per cent bitumen by weight.	Running m	21.00
13.17	**Stone masonry in cement mortar 1:3 for parapet complete as per drawing and technical specifications Clauses 700 and 1208.4**		
	I Random rubble masonry	cum	5,414.70
	II Coursed rubble masonry (1st sort)	cum	4,878.00
13.18	**Pointing with cement mortar (1:3) on brickwork in parapet as per technical specifications Clauses 613.3 and 1208.4**	10 sqm	583.50
13.19	**Plastering with cement mortar (1:3) 15 mm thick on brickwork in parapet as per technical specifications Clauses 613.4 and 1208.4**	10 sqm	1,211.70
13.20	**Providing and laying parapet with PCC M 15 as per drawing & technical specifications Clauses 800 and 1208.4**		
	A With crushed stone		
	I Nominal mix 1:2.5:5 (Hand mixing)	cum	5,379.00
	ii Nominal mix (1:2.5:5)	cum	5,403.90
	B With Natural Gravel		
	i Mix 1:2.5:5(Hand mixing)	cum	5,069.40

Item No.	Description	Unit	Rate
	ii Mix (1:2.5:5)	cum	5,044.50
13.21	**Providing bituminous wearing coat comprising of 20 mm thick premix carpet with 5 mm thick seal coat Type B for culverts as per drawing and technical specifications Clauses 1206.2 and 500**		
	i Rate for wearing coat as per item No. 5.9 of Chapter 5	sqm	
	ii Rate for seal coat Type B as per item No. 5.12 of Chapter 5	sqm	
13.22	**Providing bituminous wearing coat comprising of 50 mm thick bituminous macadam overlaid by 20 mm thick premix carpet with 5 mm thick seal coat Type B**		
	i Rate for BM layer may be analysed as per item No 5.3 of Chapter 5	cum	
	ii Rate of 20 mm premix carpet wearing course as per item No.5.9 of Chapter 5	sqm	
	iii Rate of seal coat Type B as per item No. 5.12 of Chapter 5	sqm	
13.23	**Brickwork in arches in cement mortar 1:4 complete including centering and shuttering excluding pointing and plastering as per drawing and technical specifications Clauses 606 and 1205.1**	cum	15,283.80
13.24	**Coursed rubble stone masonry arch (Ist sort) in cement mortar (1:4) complete including centering etc. complete as per drawing and technical specifications Clauses 706 and 1205.1**		
	i For arch above 6Mspan	cum	10,671.10
	ii For Arch 4 m to 6 m span	cum	9,604.00
	iii For Arch less than 4 m span	cum	8,003.30
13.25	Providing & Laying reinforced cement concrete arch complete including centering and shuttering excluding reinforcement as per drawings and technical specifications Clauses 800, 900 and 1205.1		
	A With crushed stone		
	I RCC grade M20 (1:2.4) nominal mix		
	a) For arch above 6 m span	cum	8,907.30
	b) For arch 4 m to 6 m span	cum	8,313.50
	c) For arch less than 4 m span	cum	7,719.70
	II RCC Grade M 25		
	a) For arch above 6 m span	cum	8,907.34
	b) For arch 4 m to 6 m span	cum	8,313.52
	c) For arch less than 4 m span	cum	7,719.69

Item No.	Description	Unit	Rate
	B With Natural Gravel		
	I R.C.C.Grade M20 (1:2:4) nominal mix		
	a) For arch above 6 m span	cum	8,244.40
	b) For arch 4 m to 6 m span	cum	7,694.80
	c) For arch less than 4 m span	cum	7,145.20
	II R.C.C Grade M25		
	a) For arch above 6 m span	cum	8,847.07
	b) For arch 4 m to 6 m span	cum	8,257.27
	c) For arch less than 4 m span	cum	7,667.46
13.26	**Providing steel R.S.Jst/ built-up steel sections including cutting, welding/ rivetting, hoisting, fixing in position for composite girders with shear connectors complete with painting as per drawing and technical specifications Clause 1205.6**		
	Steel section quintal	quintal	9,014.10

Chapter – 14
PROTECTION WORKS

Preamble:

1 Three types of aprons as under have been catered for:

a. Boulder apron laid dry

b. Boulder apron laid in wire crates

c. Apron laid in cement concrete blocks of M 15 grade

2 Pitching proposed is of the following types:

a. Brick pitching

b. Boulder pitching

c. CC Block pitching

3 A toe wall for toe protection of pitching can be either in random rubble masonry or in nominal mix cement concrete M 10, or in brick masonry. Depending upon the design, the rates may be adopted.

4 Flooring has been proposed in dry rubble stone, rubble stone laid in cement mortar 1:3, cement concrete blocks M 15 and brick on edge laid in cement mortar (CM) 1:3.

5 Curtain walls proposed are of the following types:

a. Brick masonry in CM 1:4

b. Coursed rubble stone masonry (1st sort) is CM 1:3

c. Cement concrete M-10 grade

6 Lead for stone materials from quarry to be considered in case of pitching and apron works.

Chapter 14
PROTECTION WORKS

Item No.	Description	Unit	Rate
14.1	**Providing and laying boulder apron for bed protection with stone boulders of minimum size and weight as per Table 1300.1, no fragment weighing less than 25 kg laid dry complete as per drawing and technical specifications Clause 1301**	cum	1,349.50
14.2	**Providing and laying of boulder apron laid in wire crates with 4 mm dia GI wire conforming to IS:280 and IS:4826 in 100 mm x 100 mm mesh (woven diagonally) including 10 per cent extra for laps and joints laid with stone boulders weighing not less than 25 kg each as per drawing and technical specifications Clause 1301**	cum	2,178.20
14.3	**Providing and laying of apron with cement concrete blocks of size as per Table 1300.1 cast-in-situ and made with nominal mix of M-15 grade cement concrete as per drawing and technical specifications Clause 1301**	cum	5,062.80
14.4	**Single bamboo palasiding / walling of whole 2nd class bamboo (Jati or Bethua) 75mm dia and closely packed & driven including fitting fixing with half bamboo kamis horizontally in three rows with cane or tying with wire complete and struts 1.5 m apart longitudinally and providing brush wood as per drawing and technical specifications Clause 1302.5**		
	Driven at least 900 mm below ground and 1200 mm above ground	Running m	782.20
	Driven at least 900 mm below ground and 900 mm above ground on average	Running m	737.20
14.5	**Providing and laying pitching on slopes laid over prepared filter media as per drawing and technical specifications Clause 1302**		
	I Stone/Boulder	cum	1,349.50
	II Cement concrete blocks of size as per Table 1300.2 cast in cement concrete of grade M 15		
	a) Concrete grade M 15	cum	5,187.30
	b) Brick pitchng set in cement mortar 1:4	cum	5,848.70
14.6	**Providing and laying filter material underneath pitching in slopes complete as per drawing and technical specifications Clause 1302**	cum	1,768.60
14.7	**Providing and laying flooring laid over cement concrete bedding complete as per drawing and technical specification Clause 1303**		
	i Rubble stone laid in cement mortar 1:3	cum	3,731.00
	ii Cement conrete blocks grade M 15	cum	5,650.10
	iii Brick on edge laid in cement mortar (1:3)	cum	4,843.00

Item No.	Description	Unit	Rate
	Note : Cement concrete bedding to be measured and paid extra.		
14.8	**Providing and laying of dry rubble flooring complete as per drawings and technical specifications Clause 1303.3**	cum	2,216.80
14.9	**Providing and laying curtain walls complete as per drawing and technical specification Clause 1304**		
	i Brick masonry in cement mortar (1:4)	cum	7,110.90
	ii Coursed rubble masonary (2nd sort) in cement mortar (1:4)	cum	4,443.70
	iii Cement concrete grade M 10	cum	4,955.80
14.10	**Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less then 25 kg beyond curtain wall**	cum	1,128.30
14.11	**Construction of toe walls for protection of slopes as per drawing and technical specifications Clause 1302.5**		
	i Random rubble masonry in case of stone pitching laid with cement mortar (1:5)	cum	3,988.60
	ii Brick masonry in cement mortar 1:4 in case of brick pitching	cum	5,742.70
	iii Cement concrete grade M 10 in case of concrete block pitching	cum	5184.00
	Nominal mix 1:3:6		
14.12	**Single bamboo spur and palisading of whole 2nd class bamboo (jati or Bethua) 65 mm to 75 mm dia and closely packed & driven, including fitting, fixing with half bamboo kamis horrizontally in three rows with cane or tying wire complete and struts 1500 mm apart longitudinally and providing brush wood as per drawing and technical specifications Clause 1302.5**		
	i Driven at least 900 mm below ground and 1800 mm above ground on average	Running m	917.20
	ii Driven at least 900 mm below ground and 900 mm above ground on average	Running m	740.90
14.13	**Single bamboo spur and palisading of whole 1st class bamboo (Bholuka or Barua) 85 mm to 100 mm dia. Closely packed & driven including fitting, fixing with half 2nd class bamboo (jati or Bethua) horizontally in three rows with cane or tying wire complete and struts 1500 mm apart longitudinally and providing brush wood in the spur as per drawings and technical specifications**		
	A Driven at least 900 mm below ground and 1800 mm above ground	Running m	1,343.70
	B Driven at least 900 mm below ground and 900 mm above ground on average	Running m	926.60

Item No.	Description	Unit	Rate
	C Driven at least 600 mm below ground and 1200 mm above ground on average.	Running m	851.60
14.14	**Bamboo spur 'A' type with whole bamboo 85mm-100mm dia, placed 230 mm centre to centre driven 900 mm below ground and 1200 mm to 1500 mm above ground tied with 2nd class bamboo (jati or Bethua) on either side at 450 mm apart horizontally with galvanised wire etc. complete as per drawings and technical specifications**		
	A 2nd class bamboo (jati or Bethua) 75 mm dia	Running m	948.30
	B 1st class bamboo (Bholuka or Barua) 85 mm to 100 mm dia	Running m	893.90
14.15	**Providing 'A' type single spur with 1st class bamboo (Bholuka or Barua) 85 mm to 100 mm dia. Driven closely placed 3m to 4m above ground and 1200 mm to 1500 mm below ground tied with cane or coir string, half 2nd class bamboo (jati or Bethua) horizontally on both face placed not more than one metre apart including whole bamboo struts inside one metre apart and 2 nos. of purlin at top and bottom fitted with vertical struts at 1500 mm apart and filling with brushwood or jungle wood inside the spur complete as per drawing and technical specifications**	Running m	1,619.30
14.16	Providing close bamboo toe walling consisting of 65mm to 75mm dia bamboos of length ranging from 1.2 m to 3m driven at 150 mm centre to centre and provided with three horizontal split bamboo runner fixed with nails. All bamboos to be duly protected by coal tar painting.	Running m	1,079.60
14.17	**Double timber spur with two rows at 800 mm c/c apart of 1st class local wood piles with timber of Azar/Nahar/Nageswar / Zarul wood 150 mm to 200 mm dia driven 2000 mm minimum below ground and 3600 mm above ground average placed at 800 mm belts, bracings etc. of 100 mm x 75 mm size 1st class local wood longitudinally & crosswiswe at ends fitted with 10 mm dia bolts and nuts etc. including coaltarring of timber members and cost of necessary bamboo stagings etc. as directed by the Engineer as per drawing and technical specifications**	Running m	23,770.60
14.18	**Supplying and filling up hollows of the timber spur to an average height of 3600 mm above ground with jungle wood branches as per drawing and technical specifications as directed by the Engineer.**	Running m	69.90

Chapter – 15
MAINTENANCE OF ROADS

Preamble:

1 In the case of rain cuts, it has been assumed that some material cut by rain, approximately 25 per cent will be available at site which can be retrieved and re-used and the balance 75 per cent is required to be provided as fresh material.

2 For making up earthen shoulders, it has been assumed that on an average 150 mm filling will be required. Similarly, for stripping of excess soil from shoulder, an average depth of 75 mm has been assumed.

3 Pothole repairs and patchwork are provided to be done by using Mixall 6/10 M.T.

4 In case of maintenance of Gravel and W.B.M. surfaces, it has been assumed that 25 per cent material will be available at site, which can be retrieved and re-used and the balance 75 per cent is required to be provided as fresh material.

5 The items of periodical renewal by premix carpet and surface coating have also been included in the rate analysis for guidance of field Engineers. The detailed analysis of various items of bituminous works is given in Chapter 5 and rates can be taken from there as appropriate. Additional provision of patch repair and profile correction varying from 10 per cent to 30 per cent of the material of premix carpet/surface dressing may be made in the estimate of periodical renewal.

Chapter 15
MAINTENANCE OF ROADS

Item No.	Description	Unit	Rate
15.1	Restoration of Rain Cuts		
	Restoration of rain cuts with soil, moorum gravel or a mixture of these, clearing the loose soil, benching for 300mm width laying fresh material in layers not exceeding 250 mm and compaction with plate compactor or power rammer to restore the original alignment, level and slopes as per drawings and technical specifications Clause 1902		
	A Manual Means	cum	130.50
	B Mechanical Means	cum	110.20
15.2	Maintenance of Earthen shoulder (filling with fresh selected soil)		
	1 Making up loss of material/irregularities on shoulders to the design level by adding fresh approved selected soil and compacting it with appropriate equipment at OMC upto a lead of 1000 m as per technical specification Clause 1903	sqm	72.10
	Maintenance of Earhen shoulder (stripping of excess soil)		
	2 Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor at OMC as per drawings and Technical Specification Clause 1903	sqm	15.60
15.3	Maintenance of Bituminous surface road		
	i Repair to pot holes by removal of failed material,trimming the sides to vertical and levelling the bottom,cleaning the same with compressed air or any appropriate method filled with 75 mm B.M. applying bitumen emulsion prime coat at the bottom and bitumen emulsion tack coat on sides and on bottom as per technical specification Clause 502 and 503	cum	7,396.20
	ii Patch repair on already filled pot holes with 75 mm BM with 20 mm premix carpet and seal coat Type B as per drawings and technical specification Clause 1904.2	sqm	173.20
	iii Repair to pot holes and removal of loose material, trimming of sides, cleaning of surface by providing tack coat, 20 mm thick pre-mix carpet and seal coat type B specification Clause 1904.2	sqm	162.90
	iv Repair to pot holes and removal of loose material, trimming of sides, cleaning of surface by providing tack coat with bitumen emulsion, 20 mm thick pre-mix carpet using catonic bitumen emulsion and seal coat type B with bitumen emulsion	sqm	173.70
15.4	Maintenance of Gravel Road		
	Maintenance of gravel road including making up the loss of profile, rectifying corrugated surface, filling up of depressions, pot holes and	sqm	347.50

Item No.	Description	Unit	Rate
	erosion gullies by adding fresh material and compacting it with appropriate equipment or to strip excess of material from the road surface as per drawings and technical specification Clause 1905		
15.5	**Maintenance of WBM Road**		
	Maintenance of WBM road including filling up of pot holes, ruts and rectifying corrugated surface, damaged edges and ravelling as per technical specification Clause 1906.	sqm	290.20
15.6	**Maintenance of Drains**		
	The maintenance of drains include erosion, repair, clearing, cleaning, reshaping, regrading, deepening of side drains as well as catch water drains as per technical specification Clause 1907.	m	2.30
15.7	**Maintenance of Culverts**		
	I Maintenance of Hume pipe Culvert by way of Clearing, Cleaning, Erosion repair, repairs to cracks, parapet wall and protection work as per drawing and technical specification Clause 1908	One No. Hume Pipe	1,439.60
	ii Maintenance of Culverts Slab type		
	Maintenance of Slab type Culverts by way of clearing, Cleaning, Erosion repair, repairs to cracks, parapet walls and Protection works as per drawing and technical specification Clasue 1908	Culvert	2,851.80
15.8	**Maintenance of Causeway**		
	Maintenance of Causeway by way of minor Surface repairs, replacing Guide Posts, repair of flood gauges, removal of debris, providing boulders and protection work and painting as per technical specification Clause 1909	m	65.50
15.9	**Maintenance of Road Signs**		
	Maintenance of road signs by way of cleaning and repainting of mandatory / requlatory / cautionary / informatory and place identifications sign board as perdrawings and technical specification Clause 1910	km	1,100.90
15.10	**Maintenance of steel and RCC Railing**		
	I Repair of steel railing to bring it to original shape cleaning and repainting as per drawing and technical specification Clause 1911		
	Steel Railing	Running m	319.40
	ii Repair of RCC railing to bring it to the original shape, cleaning and repainting as per drawings and technical specification Clause 1911		

Item No.	Description	Unit	Rate
	RCC Railing	m	137.20
15.11	**Maintenance of 200 metre and km stones**		
	Maintenance of 200 metre km stone by way of refiting of tilted stones repairing with cement mortar, cleaning, repairing and lettering on 200 metre km stone and 5th km stone as per drawing and technical specification Clause 1912		
	i Painting two coats with synthetic enamel paint	sqm	123.90
	ii Printing letters and figures of any shade with synthtic enamel paint of any approved colour to give an even shade	km	524.40
15.12	Cutting of branches of trees shrubs and trimming of grass and weeds		
	I Cutting of branches of trees and shrubs from the road way or with in R.O.W including disposal of wood and leaves to suitable location as per technical specification Clause 1914	one tree	100.00
	ii Cutting of shrubs from the road way or with in R.O.W and disposal of shrubs to suitable locations as per technical specifications Clause 1914	each	5.80
	iii Trimming of grass and weeds from the shoulders/berms and disposing off the same to suitable locations as per technical specifications Clause 1914	sqm	1.90
15.13	**White washing of parapet walls of CD work and tree truncks**		
	White washing two coats on parapet walls and tree trunks including preparation of surface by cleaning scraping etc. as per technical specifications Clause 1915	sqm	16.50
15.14	**Periodical Renewal to existing bituminous surface**		
	1 Open graded Premix carpet 20 mm thick		
	i Tack coat	sqm	10.20
	ii Pre-mix carpet using bituminous (penetration grade modified bitumen) binder	sqm	
	OR		
	iii Premix carpet using bitumen Emulsion	sqm	125.00
	iv Seal coat Type A, B or C		
	Rates as per item No. 5.11	sqm	
	2 Surface dressing single coat/first coat or 2nd coat Rates as per item No. 5.6	sqm	

PART- C

MISCELLANEOUS WORKS

Chapter-16

Miscellaneous items

Preamble

This Chapter includes various miscellaneous items, which are not covered by MORD specification for Rural Road 2004.

A number of need items for Road works and Bridge work have been incorporated in this chapter as per MoSRT&H specification for Road and Bridge works also.

As per latest revised version of MoRD specification for rural RoadsSpecific importance to some new items alongwith few new technologies like cold mix,Semi dense Biituminous concrete,soil stabilization in subgrade and Base,use of locally available marginal materials,Industrial wastes,provisions of proper road signs and other traffic control devices,Geosynthetics,Jute geo textiles alongwith construction of long span Bridges as per version of MORTH has been included in this edition.

General:

a) The clauses of MoSRT&H specifications for Roads and Bridge works,which have been mentioned for each item,may be referred to detail specifications and construction procedure.The specifications mentioned here are only brief description

b) Quality control works shall be goverened by section 900 of Mosrt&H specifications

c) The classification of of soil shall be as per clause 301.2 of MoSRT&H specifications.

d) The specification of materials shall be governed by section 1000 of MoSRT&H specifications for Road and Bridge works.

e) Quantities of cement in various grade of cement concrete have been taken as per IRC:21-2000 and IRC:18-2000.

f) The coarse and fine aggregate shall confirm to IS:383.

Road Works:

a) The machinary and equipment included in various analysis are as per various specifications of MoSRT&H are mandatory.

b) Choice of grade of Bitumen shall be made as per the guidelines given in Appendix-4 of MoSRT&H specifications.

c) The specification and requirement for modified binder with various type of modifier have been laid down in clause 521 of MoRST&H specification and IRC:SP:53-2002 which shall be followed.

d) The guideline given vide Annexure-A to clause 501 of MoSRT&H specification in regard to protection of environment shall be followed for a particular situation.

e) The quantities taken as output of the item in the rate are the compacted quantities.

Bridge Works:

General:

a) The description of items is given briefly and linked with relevant clause of MoSRT&H specification for Road&Bridge works, which may be refered for detailed description, provisions and interpretation.

b) For concrete works admixtures has been used to provide best solution in construction of superstructure of bridge works.Water reducing plasticizing admixture such as Master plast PL-1 or its equivalent is used for concrete works below M-25 grade concrete @ 100ml-200ml per bag of cement (50 kg per bag). However super plasticizer such as Master plus SPL-2 or its equivalent has been used for concrete above M-25 Grade @0.2 to 1.2 lit per bag of cement to improve workability of concretre.Use of admixture should be made with prior approval of the concerned Executive Engineer.

c) Normal method of curing has been covered in the schedule.Steam curing has been included in the items of precast concrete PSC beams

d) The items do not cover all components of bridge projects for all situations.There may be specialised items for specific cases,which need to be analyzed keeping in view the basic approach.

Foundation:

a) Mixing of Cement concrete has been considered both by using concrete mixure and batching plant.

b) Concrete batching plant is considered to be placed within 10 km of the bridge site.

c) The coarse and fine aggregate for cement for cement concrete shall be as per IS:383.

d) Pneumatic sinking is a specialized job.All safety bprecaution as per IS:4138 are required to be taken.

e) The levelling course below pile cap is proposed with M 15 grade concrete.

f) Appendix-4 of IRC:78-2000 has to be referred regarding precaution to be taken during sinking of well.

g) The concrete mix used in boottom plug shall have minimum cenment content of 330kg/cum and a slum of vabout 150mm.

h) Necessary safety precautions shall be taken for excavation on open foundations for which guidence may be taken from IS:3764

i) A levelling course of 100mm thickness in M10(1:3:6) shall be provided before lying open fondations.

j) The well curb shall be in RCC of mix not leaner than M25 grade with minimum steel reinforcement of 72kg/cum excluding bond rods.

k) The top of bottom plug shall be at least 300mm above top of curb.

l) In case of cement concrete piles, the minimum grade of concrete shall be M35 with minimum cement content of 400kg/cum

m) The guidence for piles is to be obtained from IS:2911.32

n) In the items for well foundation, provision for normal island/temporarey protection, deep islands/ coffer-dams with wooden bellies and sheet piles have been made.

Substructure:

a) Filter media and backfilling behind abutments are required to be provided as per guidelines given in IRC:78-2000.

b) Weep holes shall be provided as per clause 2706 of MoSRT&H specification.

c) In case of roller-cum-rocker bearings, only full circullar rollers are to be provided

d) All bearings shall be set truly level so as to have full and even seating.

e) For elastomeric bearing pads, the concrete surface shall be levelled such that the variation is not more than 1.5mm from a straight edge placed in any direction across the area.

f) For spans in grade, the bearing shall be placed horizontal by using sole plates for suitably designed RCC pedestals.

Superstructure:

a) The rate for anti-corrosive treatment is ascertained from firms specilized in this work.In this connection circular No RW/NH-34041/44/91-S&R dt.21.3.2000 of Ministry of Road Transport and Highways may be referred for further details.

b) MoSR&TH's letter no RW/NH-34059/1/96/S&R dt 30.11.2000 and subsequent corrigendum dt.25.1.2001 may be referred for detailed specification and provisions for various types of expansion joints.

B)Cement concrete pavement.

a) High capacities batch mix plants of 75cum/hour (effective output) has been considered in the rate analysis of cement concrete pavement works.

b) Super plasticizer admixture has been provided to improve workability with reduced water cement ratio.

c) Cement 43 grades have been catered for cement concrete pavement.However for dry lean concrete cement of 33 grade may be prefered.

C) The head Repairs and Rehabilitation includes the items as foollows:

C) in works where mixing plant are used rates are inclusive of an initial lead of 10km from mixing plant to work site.

D) Overheads and contractors profit: Due to usage of higher output of plant and machineries, Overheads are considered @10%for item of road works and 20%for items of Bridge works.Contractors profit is considered @10% for both Road works and Bridge works.

E) VAT @ 5 % and Assam building and other construction workers welfare cess @ 1%has been added in the analysis over above.

The other items includes Cold weather bridge ,Bamboo bridge,Timber bridge, etc in APWD works which are not covered by MORD and MoSRT&H Data book.

Chapter-16
Miscellenious items

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.1		Construction of Base/Subbase of pavement with lean concrete-Fly ash-Construction of Base/sub-base using cement, sand, fly ash and coarse aggregates proportioned as per table 4 of IRC: 74/1979 and with water content ratio, slump and compressive strength as defined in the said table, mix prepared in a batching and mixing plant and compacted with a vibratory roller 8 to 10 tonnes capacity within the time limit laid down vide clause 7.6.3. of I.R.C. 74-1979,construction joint properly formed at end of the days work,cured for 14 days all specified in IRC 74-1979.	cum	3572.00
16.2		Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in Sub base/ Base (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator grading with motor grader and compacting with road roller at OMC to achieve desired unconfined compressive strength and to form a layer of sub base / base.)		
		(i) For Sub-Base course	cum	2400.00
		(ii) For Base course	cum	2289.00
		Soil stabilisation in sub-grade and Base course		
16.3		Providing, laying, spreading and compacting available soil (excluding clay soil) in Sub-grade course including insitu mixing 4% of RBI 81 product, spreading in uniform layers with motor grader on a prepared base including watering and compacting with 8 to 10 tonne vibratory power roller to achieve the desired density including all materials, labour, HOM of machinery, etc complete as per specifications.	cum	3537.00
16,4		Providing, laying, spreading and compacting available clay soil in Sub-grade course including in situ mixing 30% Stone Dust, 70% Soil & 4% of RBI 81 product, spreading in uniform layers with motor grader on a prepared base including watering and compacting with 8 to 10 tonne vibratory power roller to achieve the desired density including all materials, labour, HOM of machinery, etc complete as per specifications.	cum	3800.00
16,5		Providing, laying, spreading and compacting available soil (excluding clay soil) and aggregate in base course including in situ mixing 30% Aggregate, 70% Soil & 4% of RBI 81 product, spreading in uniform layers with motor grader on a prepared base including watering and compacting with 8 to 10 tonne vibratory power roller to achieve the desired density including all materials, labour, HOM of machinery, etc complete as per specifications.	cum	4351.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16,6		Providing, laying, spreading and compacting available soil in base course including in situ mixing 30% Aggregate, 20% Stone Dust, 50% Soil & 4% of RBI 81 product, spreading in uniform layers with motor grader on a prepared base including watering and compacting with 8 to 10 tonne vibratory power roller to achieve the desired density including all materials, labour, HOM of machinery, etc complete as per specifications.	cum	4581.00
16.7		**Soil stabilisation using Geo-Textiles**		
		a) Wooven Jute Geo Textile for Road Construction and slope management purpose-Supplying,testing and installation of 100cm wide woven jute geotextiles(JGT) 724 gm/sq.m posseing tensile strength of 25kn/m(+10%,-5% tolerance) with a porometry around 150 to 400 microns and thickness 2 mm for application on road sub grades and embankments.. Jute fabric to be laid with overlaps of 100mm crosswise and 300 mm longitudinally duly secured to subgrade by U shaped m.s staples(11 gauge)/round head country nail of 150mm length at an interval of 750mm as per direction of the engineer-in-charge.(Rates F.O.R Guwahati)	sq.m.	100.00
		b) Wooven Jute Geo Textile for River Bank Protection-Supplying,testing and installation of 100cm wide woven jute geotextiles(JGT) 627 gm/ sq.m posseing tensile strength of 20kn/m(+10%,-5% tolerance) with a porometry around 150 to 400 microns and thickness 2 mm for application in river bank protection work.. Jute fabric to be laid with overlaps of 100mm crosswise and 300 mm longitudinally duly secured by U shaped m.s staples(11 gauge)/round head country nail of 150mm length at an interval of 750mm as per direction of the engineer-in-charge.(Rates F.O.R Guwahati)	sq.m.	118.00
		c) Open weave Jute Geo Textiles for control of surficial soil erosion-Supplying,testing and installation of 100cm wide woven jute geotextiles(JGT) 500 gm/sq.m posseing tensile strength of 6.5kn/mon slopes of embankment dressed and cut to a stable gradient for control of surface soil erosion .jute fabric to be laid with overlaps of 100mm crosswise and 300 mm longitudinally duly secured by U shaped m.s staples(11 gauge)/round head country nail of 150mm length at an interval of 750mm as per direction of the engineer-in-charge.(Rates F.O.R Guwahati)	sq.m.	45.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.8		Crushed Cement Concrete Sub-base / Base (Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concre slabs at a lead of 10km,laying and compacting the same as sub base/base course,constructed as WBM to cl. 404 except the use of screening or binding material	cum	302.00
16.9		0		
405.2		Penetration Coat Over Top Layer of Crushed Cement Concrete Base (Spraying of bitumen over cleaned dry surface of crushed cement concrete base at the rate of 25 kg per 10 sqm by a bitumen pressure distributor, spreading of key aggregates at the rate of 0.13 cum per 10 sqm by a mechanical gritter and rolling the surface as per 506.3.8	sqm	30.00
16.10	508	Semi - Dense Bituminous Concrete (Providing and laying semi dense bituminous concrete with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 to 5% of mix and filler transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the reqd. grade, lavel and alignment,rolling with smooth wheeled,vibratory and tandem rollers to achieve the desired compaction as per MoSRT&H cl. no.508. complete in all respect.		
		A With hydrated lime/cement as filler (refer table 500-9 of MoSRT&H specification)		
		(I) with 60/70 or VG-30 grade bitumen		
		for Grading I (13 mm nominal size)	cum	8352.00
		for GradingII(10 mm nominal size)	cum	8885.00
		(ii) with Polymer modified bitumen 70		
		(i) for Grading I (13 mm nominal size)	cum	10326.00
		(ii) for GradingII(10 mm nominal size)	cum	11078.00
		#REF! (iii)with CRMB 55		
		(i) for Grading I (13 mm nominal size)	cum	8619.00
		(ii) for GradingII(10 mm nominal size)	cum	9181.00
		B With rockdustas filler (refer table 500-9 of MoSRT&H specification)		
		(i) with 60/70 or VG-30 grade bitumen		
		for Grading I (13 mm nominal size)	cum	8077.00
		for GradingII(10 mm nominal size)	cum	8610.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		(ii) with Polymer modified bitumen 70		
		for Grading I (13 mm nominal size)	cum	10051.00
		for GradingII(10 mm nominal size)	cum	10803.00
		(iii) with CRMB 55		
		for Grading I (13 mm nominal size)	cum	8344.00
		for GradingII(10 mm nominal size)	cum	8906.00
		C With hydrated lime / cement as filler (refer table 500-9 of MoSRT&H specification) & anti stripping agent as per IS:14982(Refer Appendix-5 of MoSRT&H specification)		
		(i) with 60/70 or VG-30 grade bitumen		
		for Grading I (13 mm nominal size)	cum	8651.00
		for GradingII(10 mm nominal size)	cum	9217.00
		(ii) with Polymer modified bitumen 70		
		for Grading I (13 mm nominal size)	cum	10624.00
		for GradingII(10 mm nominal size)	cum	11410.00
		(iii) with CRMB 55		
		for Grading I (13 mm nominal size)	cum	8917.00
		for GradingII(10 mm nominal size)	cum	9513.00
		D With rock dust as filler (refer table 500-9 of MoSRT&H specification) & anti stripping agent as per IS:14982(Refer Appendix-5 of MoSRT&H specification)		
		(i) with 60/70 or VG-30 grade bitumen		
		for Grading I (13 mm nominal size)	cum	8376.00
		for GradingII(10 mm nominal size)	cum	8942.00
		(ii) with Polymer modified bitumen 70		
		for Grading I (13 mm nominal size)	cum	10349.00
		for GradingII(10 mm nominal size)	cum	11134.00
		(iii) with CRMB 55		
		for Grading I (13 mm nominal size)	cum	8675.00
		for GradingII(10 mm nominal size)	cum	9238.00
		0		
		E Using Cold mix Binder (as per IRC:SP:100-2014)		
		for Grading I (13 mm nominal size)	cum	10670.00
		for GradingII(10 mm nominal size)	cum	10832.00
16.11		0		

Item No.	Ref. of MORT&H	Description	Unit	Rate
	519	Cold Mix binder(including Gravel Emulsion) (as per IRC:SP:100-2014).Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified bitumen, including mixing in a plant of suitable type and capacity,transporting,laying,compacting and finishing to specified grades and levels.		
		Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate	cum	11848.00
		Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate	cum	11980.00
		Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate	cum	8328.00
		Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate	cum	8433.00
16.12	516	Slurry Seal Providing and laying slurry seal consisting of a mixture of fine aggregates, portland cement filler, bituminous emulsion(CSS-2) and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface.		
		(i) 5 mm thickness	sqm	73.00
		(ii) 3 mm thickness	sqm	50.00
		(iii) 1.5 mm thickness	sqm	31.00
16.13	518	Fog Spray Providing and applying low viscosity bitumen emulsion (CSS-1/CSS-1h) for sealing crack less than 3mm wide on incipient frepping for dis integration in existing surfacing.		
		(I) With Bitumen emulsion CSS-1 (IS:8887-2004)		
		(i) without blinding	sqm	39.00
		(ii) Extra for blinding the fog spray	sqm	5.00
		(II) With bitumen emulsion-CSS-1h		
		(i) without blinding	sqm	41.00
		(ii) Extra for blinding the fog spray	sqm	5.00
16.14	510	Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) (Including cost of testing of materials at site and laboratory as directed by the deptt.)		
		(a) Without anti stripping agent		
		(ii) with bitumen emulsion(CRS-2)		

Item No.	Ref. of MORT&H	Description	Unit	Rate
		:-19 mm nominal chipping size	sqm	88.00
		13 mm nominal size chipping	sqm	73.00
		(b) With anti stripping agent as per IS:14982(Refer Appendix-5 of MoSRT&H specification)		
		(ii) with bitumen emulsion(CRS-2)		
		:-19 mm nominal chipping size	sqm	88.00
		13 mm nominal size chipping	sqm	68.00
16.15	3004.3.3	Crack Filling (Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.)	metre	4.00
16.16		Seal coat with Cold mix Binder -Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels grade and cross fall using Type A,Type B and Type C as per Technical specification clause 510.With cold mix Binder(As per IRC:SP:100-2014)and through credible technology partners duly licensed by CRRI.		
		By manual means		
		Case-1: Type A (11.2mm to2.36mm)		
		Bitumen Emulsion (RS-2)	sqm	75.00
		Case-II: Type-B (2.36mm to 180 micron)		
		Bitumen Emulsion (RS-1)	sqm	52.00
		Case III: Type-C (9.5mm to 2.36mm)		
		Bitumen Emulsion (RS-2)	sqm	60.00
		By mechanical means		
		Case-1: Type A (11.2mm to2.36mm) Bitumen Emulsion (RS-2)	sqm	74.00
		Case-II: Type-B (2.36mm to 180 micron) Bitumen Emulsion (RS-1)	sqm	54.00
		Case III: Type-C (9.5mm to 2.36mm) Bitumen Emulsion (RS-2)	sqm	63.00
16.17		GEOSYNTHETICS AND REINFORCED EARTH		
		Sub-Surface Drain with Geotextiles : Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702.2.3 formed in to a stable network and a planar geocomposite structure, joints wrapped with geotextile to prevent ingress of soil all as per clause 702 and approved drawing including excavation and back filling.	metre	1205.00
16.18		Narrow Filter Sub-Surface Drain : Construction of a narrow filter sub- surface drain consisting of porous or	metre	929.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3.5 including excavation and backfilling .		
16,19		Laying Paving Fabric Beneath a Pavement Overlay : Providing and laying paving fabric with physical requirements as per table 704-2 over a tack coat of paving grade Bitumen 80-100 penetration, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling of tack coat, brooming and rolling of surfaces with pneumatic roller to maximise paving fabrics contact with pavement surfaces.	sqm	438.00
16,20		Laying Boulder Apron in Crates of Synthetic Geogrids : Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 704.2, joining sides with connectors/ring staple, top corners to be tie tensioned , placing of suitable crioss interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging , constructed as per clause 704.3 filled with stone with minimum size of 200mm and specific gravity not less than 2.65, packed witkh stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of Geotextile to prevent migration of fines , all as per clause 704 and laid as per clause 2503.3 and approved design.	cum	1068.00
16.21		Reinforced Earth Retaining Wall (Reinforced earth retaining walls have four main components as under: a) Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for facing elements (facia material). b) Facia material and its placement. c) Assembling, joining with facing elements and laying of the reinforcing elements.'d) Earth fill with granular material which is to be retained by the wall.		
		(i) Facing elements of RCC	sqm	2239.00
		(ii) Assembling, joining and laying of reinforcing elements.		
		A With reinforcing element of steel / Aluminium strips / polymeric strips.		
		Type 1 1. Galvanised carbon steel strips	metre	316.00
		Type 2 2.Copper Strips	metre	1467.00
		Type 3 3.Aluminium Strips	metre	628.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Type 4	4. Stainless steel strips	metre	840.00
		Type 5	5.Glass reinforced polymer/fibre reinforced polymer/polymeric strips	metre	840.00
		B	With reinforcing elements of synthetic geogrids	sqm	494.00
16.22		Sub-Grade Stabilization:			
		(A)	Providing and laying one layer of Non-Woven geotextile of minimum mass per unit area of 280gms/sqm.having minimum roll width of 5.0m treated with carbon black with physical properties as given in clause no 702.2.3. over 25mm thick compacted sand layer on a prepared subgrade as a filter media with necessary overlaps as per drawing and technical specification and as directed by the Engineer in charge complete.	sqm	139.00
16.23		(B)	Providing and laying one layer of Biaxial P.V.C.Knitted coated polyster Geogrid of unit roll width of 5.0m having minimum tensile strength of 40KN/m in both direction at a maximum elongation of 15% in th direction of the length of the roll and satisfying all requirements of IS Code/BIS code of practice and tests prescribed in ASTM or British standards or ISO on prepared subgrade as a seperator cum reinforceing agent with necessary overlaps as per drawing and technical specification and as directed by the Executive Engineer in charge complete.	sqm	205.00
16.24	408	Safety devices			
		Cast in Situ Cement Concrete M20 kerb (Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade 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 clause 408.			
		A	**Using Concrete Mixer**	metre	335.00
		B	**Using Concrete Batching and Mixing Plant**	metre	341.00
16.25	0	Cast in Situ Cement Concrete M 20 Kerb with Channel (Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCC M20 grade , sloped towards the kerb, kerb stone with channel laid with kerb laying machine,foundation concrete manually all complete as per clause 408.)			
		A	**Using Concrete Mixer**	metre	631.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		B Using Concrete Batching and Mixing Plant	metre	642.00
16.26	0	Reinforced Cement Concrete Crash Barrier (Provision of an 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 conforming to IRC:21 and dowel bar 25mm dia, 450mm long at expansion joints filled with pre moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclouser to MOST circular No. RW/NH - 33022/1/94-DO III dated June 1994 as per dimension in the approved drawing and at locations directed by the engineer, all as specified.		
		M 20 grade concrete	metre	4397.00
		810 Metal Beam Crash Barrier		
16.27	0	AType - A, "W" : Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2m center to center, 1.8 m high, 1.1m below ground/road level, all steel parts and fitments to be galvanized by hot dip process, all fitting to conform to IS:1367 and IS:1364, metal beam rail to be fixedon the vertical post with a spacer of channel section 150mmX75mmX5mm, 330mm long complete as per clause 810.)	metre	3623
16.28	0	B Type - B, "THRIE" : Metal Beam Crash Barrier (Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2m center to center, 12 m high, 1.15m below ground level, all steel parts and fitments to be galvanized by hot dip process, all fitting to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150mmX75mmX5mm, 546mm long complete as per clause 810.)	metre	5103
16.29	0	Portable Barricade in Construction Zone (Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x	each	3372.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes , 150mmin width at an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001.		
16.3		Permanent Type Barricade in Construction Zone		
		With Steel Components (Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips 150mm in width at an angle of 450, complete as per IRC:SP:55-2001.	each	5437.00
16.31	0	Drum Delineator in Construction Zone (Provision of	each	346.00
		metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide fitted with reflector 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001.		
16.32	0	Lighting on Bridges (Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp)	each	19072.00
16.33	0	Tree reflector made of heigh intensity grade retro-reflectorised sheeting fixed over aluminium sheeting of 2mm/0.28mm thick firmly fixed with necessary galvanized nail.		
		a) 100mm dia/100mmx100mm.	each	78.00
		b) 150mm dia/150mmx150mm.	each	110.00
16.34	0	Providing reflective pavement marker with Micro prismatic lens in both direction having thermoplastic body adhering to the specification and guidelines of MoSRT&H's fixed to the road surface using the adhesives and the procedures recommended by the manufacturers with three months replacement warranty and free maintenance.	each	249.00
16.35	0	Providing and fixing lane divider with dimensions 220x150x285 mm base plate 25 mm high Two- way reflective with 1 or 2x128 glass elements rubber flag with 2 round glass reflectors	Each	975.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.36		Bio engineering measure in slope stabilization and protection		
	307	Spreading of Sludge Farm Yard Manure or/and good Earth (Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm- yard manure or/and good earth to be paid for separately)	cum	15.00
16,37	0 307	Grassing with ' Doobs' Grass (Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed)		
		(i) In rows 15 cm apart in either direction	sqm	28.00
		(ii) In rows 7.5 cm apart in either direction	sqm	51.00
16.38	0 307	Planting of Trees and their Maintenance for three Year (Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge mannure, planting the saplings, backfilling the trenches, watering , fixing the tree guatrd and maintaining the plants for three year.	each	660.00
16.39	0	Compensatory Afforestation (Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil , planting of sapling 2m high with 25cm dia stem, backfilling the hole and watering.	hectare	100173.00
16.4	0	Providing approved variety of vetiver plantation certified by The Vetiver Network International (TVNI) or its affiliate in India including pouching of tiller with selected soil for agricultural use mixed with farmyard manure in 8"x 6" poly pouch, maintaining the pouched plants for at least 1(one) month with application of growth promoter, fertilizer, watering, weeding etc., dressing of the area of plantation, planting the pouched plants as per design approved by The Vetiver Network International (TVNI) or its affiliate in India. (Excluding jungle clearance, earth work in trimming, cutting, filling etc.) and Maintenance of the vetiver plants by watering, pruning, weeding, mulching, application of manure, fertilizer, growth promoter etc. for 4 (four) months after completion of plantation.		
		Part-1 Plantation Part	metre	82.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		Part-II Maintenance part	metre	28.00
16.41	0	Construction of cold weather Bamboo bridge overall width of 3.70m and clear road way 3m with jungle wood post 20cm to 25cm dia 5nos. In each rows and rows being 2.1m. apart except for the navigable span which should be 3m. Post to be driven at least 180cm. or more below ground level including providing 20cm to 25cm center to center and placed over 20 cm dia, jungle wood dham, 15cm dia. jungle wood bracing collar fixed by bolts and nuts, straps etc. mature bholuka Bamboo cross groth all closely packed and tied 75cm wide track way made from 38mm thick 1st class local plank fixed on 75mmx100mm first class local wood battens 120cm apart and 3 lines of jati bamboo horizantal railing fixed in bholuka bamboo post placed at 210cm apart and white washed including all necessary nuts and bolts, coir ropes, struts, nails etc. complete with a layer of brushwood to exposed portion out-side trackway with earth topping complete as per direction of the department.	Rm	11707.00
16.42	0	Making 120cm wide bamboo foot bridge with 100mm Bholuka or Barua bamboo posts driven 120 cm to 180 cm underground 3 Nos. in each row and rows being 3m apart bholuka or Barua bamboo dham placed over the posts and tied with cane or wire , Bholuka or barua bamboo struts in each row both up and down stream, jati bamboo long gorhs closely packed and tied with dham. Single layer of mat placed over 75mm thick brush wood and tied with bholuka or Barua bamboo rail stand fixed in one side of the bridge etc. complete.	Rm	864.00
		Timber Bridge		
16.43		Supplying and driving sal piles 25cm to 30cm dia. Dressed to heart wood including making length in every 30 cm interval, coal tarring two (2) coats with best tar applied hot (Rate inclusive of the cost of the required quantity of tar.)		
		With Rod monkeyand crab winch		
		Portion of pile actually driven underground.	meter	5217.00
		Portion of pile remaining above rground.	meter	5107.00
		Using labour		
		Portion of pile actually driven underground.	meter	4991.00
		Portion of pile remaining above rground.	meter	4882.00
		0		

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.44	0	Supplying and driving Azar/Nahar/Nageswar/Zarul piles 25cm to 30cm dia. Dressed to heart wood including making length in every 30 cm interval, coal tarring two (2) coats with best tar applied hot (Rate inclusive of the cost of the required quantity of tar.)		
		With Rod monkeyand crab winch	meter	4425.00
		Portion of pile actually driven underground.	meter	4315.00
		Portion of pile remaining above ground.		
		With hand shaking	meter	2134.00
		Portion of pile actually driven underground.	meter	1862.00
		Portion of pile remaining above ground.		
		0		
		Sal Wood work including supplying , fitting and fixing complete with necessary M.S. bolts, nuts, nails, screw etc. and coal tarring two (2) coats with best tar applied hot (Rate is inclusive of the cost of the required quantity of tar.)		
16.45		Underssed wood work in floor planks, collars, bracing, standards, wheel guards, struts and railings, runner belts, rail, posts etc.	cum	28132.00
16.46		In track way planks (alternate nailing to be done with decking in a seggragate way.)	cum	27878.00
		0		
16.47		Azar or Nahar or Nageswar or zarul ofr sundi or gamari wood works including supplying , fitting , and fixing complete with necessary M.S. bolts, nuts, nails scerws etc. and coal tarring two coats with best tar applied hot (Rate is inclusive of the cost of the required quantity of tar.)		
		0		
		Undressed in floor planks, collars, bracing, standards, wheel guards, struts and railings, runner belts, rail, posts etc	cum	20805.00
		In track way planks (alternate nailing to be done with decking in a seggragate way.)	cum	19853.00
		0		
16.48		Supplying, fitting and fixing timber beam and bearing beam rectangular in size fitted with M.S. etc. supplying spikes etc. as necessary and coal tarring two (2) coats with best tar applied hot as directed (tRate is inclusive of cost of the required quantity of tar.)		
		Using Sal Timber	cum	28761.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		Using Azar or Nahar or Nahar or Nageswar or Zarul sawn timber 0	cum	23501.00
16.49		Supplying, fitting and fixing 25 cm to 30 cm dia. sal wood log beam dressed to heartwood including supplying and fixing with 20mm dia M.S. bolts and nuts etc.including coal tarring two (2) coats with best tar applied hot as directed (Rate is inclusive of cost of the required quantity of tar.) 0	meter	5725.00
16.5		Supplying, fitting and fixing Azar or Nahar or Nageswar or Zarul sawn timber beam and bearing beam rectangular in size fitted with MS cleats, straps etc. supplying spikes etc. as necessary and coal taring two coats with best tar applied hot as directed(Rate is inclusive of cost of the required quantity if tar) 0	meter	4927.00
16.51		Labour for scarfing and joining piles 25 cm to 30 cm dia Dressed to heartwood 90 cm. In length includng supplying, fitting and fixing with 2 nos. of 50 mmX 10 mm MS FI clamps and 16 mm dia MS bolts and nuts etc. complete as directed	each Joints	1209.00
16.52		Labour for taking out old piles of the bidge and stacking them at suitable place as directed	each	1306.00
16.53		Labour for dismanteling all members of the timber bridge (except piles) and stacking them at sutiable places as directed(all members will be under custody of the contractor till taken over by th department.)scarfing and joining piles 25 cm to 30 cm dia Dressed to heartwood 90 cm. In length includng supplying, fitting and fixing with 2 nos. of 50 mmX 10 mm MS FI clamps and 16 mm dia MS bolts and nuts etc. complete as directed 0	meter	1046.00
16.54		Labour for driving piles 25 cm to 30 cm dia Dressed to heartwood marking length in every 30 cm. interval includng coalteringtwo (2) coats with best tar applied hot including providing ncessary scaffolding or staging(rate is inclusive of the cost of required quantityof tar.)		
		(a) With Rod monkeyand crab winch		
		(i) Portion of pile actually driven under ground	meter	538.00
		(ii) Portion of pile remaining over ground	meter	428.00
		(b) By use of labour		
		(i) Portion of pile actually driven under ground	meter	848.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		(ii) Portion of pile remaining over ground	meter	557.00
16.55		Labour for fitting and fixing RSJ beam, CI saddle etc. in position including necessary scaffolding, cutting them to required size, drilling holes and supplying and fixing ncessary bolts and nuts, painting two coats complete (Tar-paints to be supplied by the contractor at his own costs) including carrying from PWD Godown.	Quintal	634.00
16.56		Labour for fitting and fixing RSJ beam, old CI saddle etc. in position including necessary scaffolding, and fixing ncessary bolts and nuts, painting two coats complete (Tar/ -Steel/paints to be supplied by the contractor at his own costs)	Quintal	542.00
16.57		Labour for making and fitting MS F.I. Straps and cleats etc. in position including drilling holes and carrying the same from PWD godown.	Quintal	1630.00
16.58		Labour for making "U" shapeed flat iron strap 0.5mX0.3m size from 150mmX12mm size MS flat including providing 10 bolts holes and fitting with 0.35m long 20mm dia MS bolts including fitting tightly withbearing beam, pile and RSJ beams etc. as diected by the Department.	each	1266.00
16.59		Labour for fitting woodwork including sizing , supplying and fixing with new MS bolts, nuts, nails, spikes, and coal tarring applied hot (Coal tar to be supplid by the contractor at his own costs) including carrying from the PWD godown.		
		0		
		(a) Applying 2 (two) coats	cu.m.	2407.00
		(b) Applying 1 (one) coats	cu.m.	1350.00
		0		
16.6		Labour for fitting and fixing 25cm to 30 cm dia log beam including supplying and fixing necessary MS nuts and bolts etc. and coal tarring.coats appiled hot as dirceted (coal tar to be supplied by the contractor at his own cost.)		
		(a) Applying 2 (two) coats	meter	505.00
		(b) Applying 1 (one) coats	meter	238.00
16.61		Labour for talking out old woodworks of bridge and the refitting the same including supply.ing and fixing necessary new MS bolts, nuts, spikes, nail as directed (Coal tar to be supplied by the contractor at his own costs.)	cum	3097.00
16.62		Labour for talking out old log beam of bridge and refitting the same including supplying and fixing necessary new MS bolts, nuts, spikes, nail etc an d coaltering on coat applied hot as directed (Coal tar to be supplied by the contractor at his own costs.)	meter	244.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.63		Pile shoes : supplying fitting and fixing the pile shoes made of 6mm thick mild steel plate with necessary welding joints, size of pile shoe will be 78.54 cm(circumferential length of at top.) X50cm(Depth) X 5cm(circumferential length at bottom) and inside 25cm inside diameter at top, including fitting and fixing 39Three) nos. M.S. plate of size of 6mmX50mm, length 45cm at top of the pile shoe with necessary welding and drilling three nos of holes in each plate including fitting and fixing the pile shoes at the pile end with necessary patent nails etc. , complete as directed by the Department .The pile shoe should be camphered to fit the pile shoe properly withnecessary grooving for placing the MS plates and pile shoe.	Each	1050.00
16.64		Making subway 3 M wide including providing banner & sign board and lamp etc. During construction of Bridge.	RM	1773.00
		a) Labour for spreading gravel	cum	152.00
		b) Labour for spreading Sand gravel	cum	64.00
16.65		Plum concrete work with 40% plum hard blasted Boulder of 150mm to 200mm size filled interstices with 60% of cement concrete in proportion 1:3:6 of 10mm to 40mm size stone aggregates including shuttering ,curing etc.complete as directed.	cum	6190.00
		BRIDGE AS PER MORT&H SPECIFICATIONS **FOUNDATIONS**		
16.66		**Excavation for Structures** (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.		
		I Ordinary soil		
		A Manual Means		
		(I) Without dewatering		
		(i) upto 3 m depth	cum	110.00
		(ii) 3 m to 6 m depth	cum	144.00
		(iii) Above 6 m depth	cum	188.00
		(II) With dewatering		
		(i) upto 3 m depth	cum	121.00
		(ii) 3 m to 6 m depth	cum	162.00
		(iii) Above 6 m depth	cum	207.00
		B Mechanical Means		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(I)	**Without dewatering**		
		(i)	Depth upto 3 m	cum	52.00
		(ii)	Depth 3 m to 6 m	cum	59.00
		(iii)	Depth above 6m	cum	72.00
		(II)	**With dewatering**		
		(i)	Depth upto 3 m	cum	54.00
		(ii)	Depth 3 m to 6 m	cum	64.00
		(iii)	Depth above 6m	cum	79.00
		II	**Ordinary rock (not requiring blasting)**		
		A	Manual Means		
		(I)	Without dewatering		
			Depth upto 3 m	cum	159.00
		(ii)	With dewatering		
			Depth upto 3 m	cum	172.00
		B	Mechanical Means		
		(I)	Without dewatering		
			Depth upto 3 m	cum	65.00
		(ii)	With dewatering		
			Depth upto 3 m	cum	71.00
		III	**Hard rock (requiring blasting)**		
		A	Manual Means		
		(I)	Without dewatering	cum	384.00
		(ii)	With dewatering	cum	414.00
		IV	**Hard rock (blasting prohibited)**		
		A	Mechanical Means		
		(I)	Without dewatering	cum	414.00
		(ii)	With dewatering	cum	451.00
		V	**Marshy soil**		
		(i)	upto 3 m depth		
		A	Manual means		
		(I)	Without dewatering	cum	418.00
		(ii)	With dewatering	cum	503.00
		B	Mechanical Means		
		(I)	Without dewatering	cum	128.00
		(ii)	With dewatering	cum	151.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		VI	Back Filling in Marshy Foundation Pits	cum	287.00
16.67		**Filling Annular Space Around Footing in Rock** (Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per items 12.4.)		cum	5216.60
16.68		Sand Filling in Foundation Trenches as per Drawing & Technical Specification		cum	1910.00
16.69		**PCC 1:3:6 in Foundation** (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)		cum	5742.00
16.70		Brick masonry work in cement mortar 1:3 in foundation complete excluding pointing and plastering, as per drawing and technical specifications		cum	6235.00
16.70		**A**	Cement mortar1:3 (1cement :3 sand)	cum	5424.00
		B	Cement mortar1:2 (1cement :2 sand)	cum	6505.00
		C	Cement mortar1:4 (1cement :4 sand)	cum	4700.00
		D	Cement mortar1:6 (1cement :6 sand)	cum	4096.00
16.71			Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification		
		(a)	Square Rubble Coursed rubble masonry (first sort)	cum	4029.00
		(b)	Random Rubble Masonry	cum	3770.00
16.72		**Plain/Reinforced cement concrete, in open foundation complete as per drawing and technical specification including steel shuttering formwork.**			
		(N)	**Without plasticiser**		
		A	PCC Grade M15	cum	6277.00
		B	PCC Grade M20	cum	7056.00
		C	(I) RCC Grade M20		
		Case I	Using concrete mixer	cum	7333.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7210.00
		D	PCC Grade M25		
		Case I	Using concrete Mixer	cum	7567.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7448.00
		E	RCC Grade M25		
		Case I	Using concrete Mixer	cum	7849.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7726.00
		F	PCC Grade M30		
		Case I	Using Concrete Mixer	cum	7606.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7482.00
		G	RCC Grade M30		
		Case I	Using Concrete Mixer	cum	7862.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7741.00
		H	RCC Grade M35		
		Case I	Using Concrete Mixer	cum	7969.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7849.00
		(P)	**With plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999.**		
		A	PCC Grade M15	cum	6972.00
		B	PCC Grade M20	cum	7924.00
		C	(I)RCC Grade M20		
		Case I	Using concrete mixer	cum	8209.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8085.00
		D	PCC Grade M25		
		Case I	Using concrete Mixer	cum	8464.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8345.00
		E	RCC Grade M25		
		Case I	Using concrete Mixer	cum	8755.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8631.00
		F	PCC Grade M30		
		Case I	Using Concrete Mixer	cum	8514.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8389.00
		G	RCC Grade M30		
		Case I	Using Concrete Mixer	cum	8773.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8652.00
		H	RCC Grade M35		
		Case I	Using Concrete Mixer	cum	8910.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8789.00
16.73		Providing and constructing temporary island 16 m diameter for construction of well foundation for 8m dia. Well.			
		A	Assuming depth of water 1.0 m and height of island to be 1.25m.	each	37051.00
		B	Assuming depth of water 4.0 m and height of island 4.5 m.	each	689772.00
		C	Providing and constructing one span service road to reach island location from one pier location to another pier location	metre	1973.00
16.74		Providing and laying cutting edge of mild steel weighing 40 kg per metre for well foundation complete as per drawing and technical specification.		tonne	102973.00
16.75		**Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification including steel shuttering formwork.**			
		(N)	**Without plasticiser**		
		A	**Well curb**		
		(i)	RCC M20 Grade		
		Case I	Using concrete mixer	cum	7606.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7491.00
		(ii)	RCC M25 Grade		
		Case I	Using concrete mixer	cum	8224.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8108.00
		(iii)	RCC M30 Grade		
		Case I	Using concrete mixer	cum	8260.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8147.00
		(iv)	RCC M35 Grade		
		Case I	Using concrete mixer	cum	8429.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8316.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		B	**Well steining**		
		(I)	PCC M15 Grade	cum	6103.00
		(ii)	PCC M20 Grade	cum	6772.00
		(iii)	RCC M20 Grade		
		Case I	Using concrete mixer	cum	6972.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	6867.00
		(iv)	PCC M25 Grade		
		Case I	Using concrete mixer	cum	7331.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7344.00
		(v)	RCC M25 Grade		
		Case I	Using concrete mixer	cum	7539.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7432.00
		(vi)	PCC M30 Grade		
		Case I	Using concrete mixer	cum	7392.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7285.00
		(vii)	RCC M30 Grade		
		Case I	Using concrete mixer	cum	7572.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7468.00
		(viii)	RCC M35 Grade		
		Case I	Using concrete mixer	cum	7726.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7623.00
		(ix)	RCC M40 Grade (With Batching Plant, Transit Mixer and Concrete Pump)	cum	8463.00
		C	**Bottom Plug**		
		(i)	PCC Grade M20		
		Case I	Using Concrete Mixer	cum	7518.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	7473.00
		(ii)	PCC Grade M25		
		Case I	Using Concrete Mixer	cum	7778.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	7753.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(iii)	PCC Grade M30		
		Case I	Using Concrete Mixer	cum	7859.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	7814.00
		(iv)	PCC Grade M35		
		Case I	Using Concrete Mixer	cum	7995.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump		
		D	**Intermediate plug**		
		(I)	Grade M20 PCC		
		Case I	Using Concrete Mixer	cum	6551.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	6430.00
		(ii)	Grade M25 PCC		
		Case I	Using Concrete Mixer	cum	6821.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	6696.00
		(iii)	Grade M30 PCC		
		Case I	Using Concrete Mixer	cum	6875.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	6754.00
		E	**Top plug**		
		(i)	Grade M15 PCC		
		Case I	Using Concrete Mixer	cum	5548.00
		(ii)	Grade M20 PCC		
		Case I	Using Concrete Mixer	cum	6156.00
		(iii)	Grade M25 PCC		
		Case I	Using Concrete Mixer	cum	6665.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	6677.00
		(iv)	Grade M30 PCC		
		Case I	Using Concrete Mixer	cum	6720.00
		Case II	Using Batching Plant, Transit Mixer and Crane /concrete pump	cum	6622.00
		F	**Well cap**		
		(i)	RCC Grade M20		
		Case I	Using concrete Mixer	cum	7275.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7151.00
		(ii)	RCC Grade M25		
		Case I	Using concrete Mixer	cum	7849.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7728.00
		(iii)	RCC Grade M30		
		Case I	Using Concrete Mixer	cum	7862.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7740.00
		(iv)	RCC Grade M35		
		Case I	Using Concrete Mixer	cum	7969.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	7849.00
		(v)	RCC M40 Grade	cum	7972.00
		(P)	**With plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999.**		
		A	**Well curb**		
		(i)	RCC M20 Grade		
		Case I	Using concrete mixer	cum	8369.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8255.00
		(ii)	RCC M25 Grade		
		Case I	Using concrete mixer	cum	9166.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	9052.00
		(iii)	RCC M30 Grade		
		Case I	Using concrete mixer	cum	9211.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	9098.00
		(iv)	RCC M35 Grade		
		Case I	Using concrete mixer	cum	9416.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	9303.00
		B	**Well steining**		
		(I)	PCC M15 Grade	cum	6803.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(ii)	PCC M20 Grade	cum	7472.00
		(iii)	RCC M20 Grade		
		Case I	Using concrete mixer	cum	7672.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7567.00
		(iv)	PCC M25 Grade		
		Case I	Using concrete mixer	cum	8188.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8087.00
		(v)	RCC M25 Grade		
		Case I	Using concrete mixer	cum	8403.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8297.00
		(vi)	PCC M30 Grade		
		Case I	Using concrete mixer	cum	8262.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8154.00
		(vii)	RCC M30 Grade		
		Case I	Using concrete mixer	cum	8444.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8340.00
		(viii)	RCC M35 Grade		
		Case I	Using concrete mixer	cum	8632.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8528.00
		(ix)	RCC M40 Grade	cum	9487.00
		C	**Bottom Plug**		
		(i)	PCC Grade M20		
		Case I	Using Concrete Mixer	cum	8461.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	8415.00
		(ii)	PCC Grade M25		
		Case I	Using Concrete Mixer	cum	8709.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	8659.00
		(iii)	PCC Grade M30		
		Case I	Using Concrete Mixer	cum	8780.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	8734.00
		(iv)	PCC Grade M35		
		Case I	Using Concrete Mixer	cum	8947.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	8898.00
		D	**Intermediate plug**		
		(I)	Grade M20 PCC		
		Case I	Using Concrete Mixer	cum	7266.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	7145.00
		(ii)	Grade M25 PCC		
		Case I	Using Concrete Mixer	cum	7599.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	7474.00
		(iii)	Grade M30 PCC		
		Case I	Using Concrete Mixer	cum	7665.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	7566.00
		E	**Top plug**		
		(i)	Grade M15 PCC		
		Case I	Using Concrete Mixer	cum	6184.00
		(ii)	Grade M20 PCC		
		Case I	Using Concrete Mixer	cum	6793.00
		(iii)	Grade M25 PCC		
		Case I	Using Concrete Mixer	cum	7444.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	7352.00
		(iv)	Grade M30 PCC		
		Case I	Using Concrete Mixer	cum	7510.00
		Case II	Using Batching Plant, Transit Mixer and Crane/ concrete pump	cum	7412.00
		F	**Well cap**		
		(i)	RCC Grade M20		
		Case I	Using concrete Mixer	cum	8136.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8011.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(ii)	RCC Grade M25		
		Case I	Using concrete Mixer	cum	8755.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8633.00
		(iii)	RCC Grade M30		
		Case I	Using Concrete Mixer	cum	8773.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8651.00
		(iv)	RCC Grade M35		
		Case I	Using Concrete Mixer	cum	8910.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	8789.00
		(v)	RCC M40 Grade Using Batching Plant, Transit Mixer and Concrete Pump	cum	8941.00
16.76		**Sinking of 6 m external diameter well** (other than pneumatic method of sinking) **through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewedfrom bed level.**			
		A	**Sandy soil**		
		(i)	Depth below bed level upto 3.0 M	metre	4645.00
		(ii)	Beyond 3m upto 10m depth	metre	6674.00
		(iii)	Beyond 10m upto 20m	metre	8814.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	16534.00
		b	For sinking including kentledge	metre	19841.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	39283.00
		b	For sinking including kentledge	metre	47140.00
		B	**Clayey soil (6m dia. Well)**		
		(i)	Depth below bed level upto 3.0 M	metre	6696.00
		(ii)	Beyond 3m upto 10m depth	metre	14147.00
		(iii)	Beyond 10 m upto 20 m		
		a	For sinking	metre	18684.00
		b	For sinking including kentledge	metre	19618.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	35045.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		b	For sinking including kentledge	metre	43806.00
		c	For sinking including kentledge & dewatering if required.	metre	45996.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	83259.00
		b	For sinking including kentledge	metre	99911.00
		c	For sinking including kentledge & dewatering if required.	metre	104906.00
		C	**Soft rock (6m dia well)**		
		(i)	Depth of soft rock strata upto 3m	metre	17932.00
		D	Hard rock (6m dia well)		
		(i)	Depth of soft rock strata upto 3m	metre	19611.00
16.77			Sinking of 7 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
		A	**Sandy soil**		
		(i)	Depth below bed level upto 3.0 M	metre	7049.00
		(ii)	Beyond 3m upto 10m depth	metre	9571.00
		(iii)	Beyond 10m upto 20m	metre	12642.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	23711.00
		b	For sinking including kentledge	metre	28454.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	56336.00
		b	For sinking including kentledge	metre	67604.00
		B	Clayey soil (7m dia. Well)		
		(I)	Depth below bed level upto 3.0 M	metre	9571.00
		(ii)	Beyond 3m upto 10m depth	metre	13999.00
		(iii)	Beyond 10 m upto 20 m		
		(a)	For sinking	metre	18487.00
		b	For sinking including dewatering, if required., if required	metre	19412.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	34676.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		b	For sinking including kentledge	metre	43346.00
		c	For sinking including kentledge & dewatering, if required.	metre	45513.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	82385.00
		b	For sinking including kentledge		98862.00
		c	For sinking including kentledge & dewatering, if required.	metre	103805.00
		C	Soft rock (7m dia well)		
		(i)	Depth of soft rock strata upto 3m	metre	15687.00
		D	Hard rock (7m dia well)		
		(i)	Depth upto 3 m	metre	22308.00
16.78		Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.			
		A	**Sandy soil**		
		(i)	Depth below bed level upto 3.0 M	metre	8703.00
		(ii)	Beyond 3m upto 10m depth	metre	10750.00
		(iii)	Beyond 10m upto 20m	metre	14196.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	26629.00
		b	For sinking including kentledge	metre	31954.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	63267.00
		b	For sinking including kentledge	metre	75921.00
		B	**Clayey soil (8m dia. Well)**		
		(i)	Depth upto 3.0 M	metre	11712.00
		(ii)	Beyond 3m upto 10m depth	metre	14507.00
		(iii)	Beyond 10 m upto 20 m		
		a	For sinking	metre	19161.00
		b	Adding for dewatering @ 5% of cost, if required.	metre	20119.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	35940.00
		b	For sinking including kentledge	metre	44926.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	For sinking including kentledge & dewatering, if required.	metre	47172.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	85390.00
		b	For sinking including kentledge	metre	102468.00
		c	For sinking including kentledge & dewatering, if required.	metre	107592.00
		C	**Soft rock (8m dia well)**		
		(i)	Depth in soft rock strata upto 3m	metre	17524.00
		D	Hard rock (8m dia well)		
		(i)	Depth in hard rock strata upto 3 m	metre	22424.00
16.79		Sinking of 9 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.			
		A	**Sandy soil**		
		(i)	Depth below bed level upto 3.0 M	metre	8794.00
		(ii)	Beyond 3m upto 10m depth	metre	11799.00
		(iii)	Beyond 10m upto 20m	metre	15582.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	29229.00
		b	Adding 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	35075.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	69445.00
		b	For sinking including kentledge	metre	83334.00
		B	**Clayey soil (9m dia. Well)**		
		(i)	Depth below bed level upto 3.0 M	metre	12349.00
		(ii)	Beyond 3m upto 10m depth	metre	15651.00
		(iii)	Beyond 10 m upto 20 m		
		a	For sinking	metre	20671.00
		b	For sinking including dewatering, if required	metre	21705.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	38773.00
		b	For sinking including kentledge	metre	48467.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	For sinking including kentledge & dewatering, if required.	metre	50890.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	92120.00
		b	For sinking including kentledge	metre	110544.00
		c	For sinking including kentledge & dewatering, if required.	metre	116071.00
		C	**Soft rock (9m dia well)**		
		(i)	Depth upto 3m	metre	21209.00
		D	Hard rock (9m dia well)		
		(i)	Depth of hard rock strata upto 3 m	metre	25806.00
16.80		Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.			
		A	**Sandy soil**		
		(i)	Depth below bed level upto 3.0 M	metre	10620.00
		(ii)	Beyond 3m upto 10m depth	metre	12444.00
		(iii)	Beyond 10m upto 20m	metre	16434.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	30823.00
		b	For sinking including kentledge	metre	36988.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	73231.00
		b	Adding 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	87877.00
		B	**Clayey soil (10m dia. Well)**		
		(i)	**Depth below bed level upto 3.0 M**	metre	13499.00
		(ii)	**Beyond 3m upto 10m depth**	metre	15292.00
		(iii)	**Beyond 10 m upto 20 m**		
		a	For sinking	metre	20195.00
		b	Adding for dewatering @ 5% of cost, if required.	metre	21205.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	37882.00
		b	For sinking including kentledge	metre	47352.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	For sinking including kentledge & dewatering, if required.	metre	49720.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	90001.00
		b	For sinking including kentledge	metre	108002.00
		c	For sinking including kentledge & dewatering, if required.	metre	113402.00
		C	**Soft rock (10m dia well)**		
		(i)	Depth of soft rock strata upto 3m	metre	22669.00
		D	**Hard rock (10m dia well)**		
		(i)	Depth of hard rock strata upto 3 m	metre	29869.00
		16.81	Sinking of 11 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
		A	**Sandy soil**		
		(i)	Depth from bed level upto 3.0 M	metre	24582.00
		(ii)	Beyond 3m upto 10m depth	metre	18995.00
		(iii)	Beyond 10m upto 20m	metre	25085.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	47049.00
		b	For sinking including kentledge	metre	56459.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	111781.00
		b	For sinking including kentledge	metre	134137.00
		B	**Clayey soil (11 m dia. Well)**		
		(i)	Depth from bed level upto 3.0 M	metre	22500.00
		(ii)	Beyond 3m upto 10m depth	metre	31403.00
		(iii)	Beyond 10 m upto 20 m		
		a	For sinking	metre	41474.00
		b	For sinking including dewatering, if required	metre	43548.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	77793.00
		b	For sinking including kentledge	metre	97241.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	For sinking including kentledge & dewatering, if required.	metre	102103.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	184825.00
		b	For sinking including kentledge	metre	221790.00
		c	For sinking including kentledge & dewatering, if required.	metre	232880.00
		C	**Soft rock (11m dia well)**		
		(i)	Depth of soft rock strata upto 3m	metre	50942.00
		D	**Hard rock (11m dia well)**		
		(i)	Depth of hard rock upto 3 m	metre	67139.00
16.82		Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.			
		A	**Sandy soil**		
		(i)	**I) Depth below bed level upto 3.0 M**	metre	50579.00
		(ii)	**Beyond 3m upto 10m depth**	metre	56640.00
		(iii)	**Beyond 10m upto 20m**	metre	74804.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	140313.00
		b	For sinking including kentledge	metre	168376.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	333365.00
		b	For sinking including kentledge	metre	400039.00
		B	**Clayey soil (12 m dia. Well)**		
		(i)	**Depth below bed level upto 3.0 M**	metre	55301.00
		(ii)	**Beyond 3m upto 10m depth**	metre	80223.00
		(iii)	**Beyond 10 m upto 20 m**		
		a	For sinking	metre	105948.00
		b	For sinking including dewatering, if required	metre	111246.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	198731.00
		b	For sinking including kentledge	metre	248414.00
		c	For sinking including kentledge & dewatering, if required.	metre	260835.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	472156.00
		b	For sinking including kentledge	metre	566587.00
		c	For sinking including kentledge & dewatering	metre	594917.00
		C	**Soft rock (12m dia well)**		
		(i)	**Depth of soft rock strata upto 3m**	metre	120675.00
		D	**Hard rock (12m dia well)**		
		(i)	**Depth of hard rock strata upto 3 m**	metre	153945.00
16.83		Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.			
		A	**Sandy soil**		
		(i)	**Depth from bed level upto 3.0 M**	metre	11466.00
		(ii)	**Beyond 3m upto 10m depth**	metre	12363.00
		(iii)	**Beyond 10m upto 20m**	metre	16328.00
		(iv)	Beyond 20m upto 30 m		
		a	For sinking	metre	30626.00
		b	For sinking including kentledge	metre	36751.00
		(v)	Beyond 30m upto 40 m		
		a	For sinking	metre	72764.00
		b	For sinking including kentledge	metre	87317.00
		B	**Clayey soil (Twin D Type Well)**		
		(i)	**Depth below bed level upto 3.0 M**	metre	13420.00
		(ii)	**Beyond 3m upto 10m depth**	metre	16946.00
		(iii)	**Beyond 10 m upto 20 m**		
		a	For sinking	metre	22380.00
		b	For sinking including dewatering, if required	metre	23499.00
		(iv)	Beyond 20m upto 30 m		
		a	Water Bound Macadam Sub-base/base	metre	41977.00
		b	For sinking including kentledge	metre	52471.00
		c	For sinking including kentledge & dewatering, if required.	metre	55095.00
		(v)	Beyond 30m upto 40 m		
		a	Water Bound Macadam Sub-base/base	metre	99733.00
		b	For sinking including kentledge	metre	119679.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		c For sinking including kentledge & dewatering, if required.	metre	125663.00
		C Soft rock (Twin D Type well)		
		(i) Depth of soft rock strata upto 3m	metre	25701.00
		D Hard rock (Twin D Type well)		
		(i) Depth of hard rock strata upto 3 m	metre	32431.00
16.84		Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant & materials		
16.85		Sand filling in wells complete as per drawing and technical specifications	cum	1910.00
16.86		Providing steel liner 10 mm thick for curbs and 6mm thick for steining of wells including fabricating and setting out as per detailed drawing	tonne	93725.00
16.86		**A** Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-750 mm)	metre	6567.00
16.86		**B** Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (asterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999 (Pile diameter-750 mm)	metre	7035.00
16.87		**A** Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-1000 mm)	metre	11044.00
16.87		**B** Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent)	metre	11876.00

Item No.	Ref. of MORT&H		Description	Unit	Rate
			conforming to IS-9103-1999) (Pile diameter-1000 mm)		
16.88		**A**	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-1200 mm)	metre	14651.00
16.88		**B**	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999 (Pile diameter-1200 mm)	metre	15848.00
16.89		**A**	Driven cast-in-place vertical M35 grade R.C.C. pile excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 750 mm)	metre	14651.00
16.89		**B**	Driven cast-in-place vertical M35 grade R.C.C. pile excluding reinforcement complete as per drawing and & Technical Specification including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999 (Pile diameter - 750 mm)	metre	15848.00
16.90		**A**	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 1000 mm)	metre	4875.00
16.90		**B**	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999 (Pile diameter - 1000 mm)	metre	5343.00
16.91		**A**	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 1200 mm)	metre	8261.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.91		**B** Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999 (Pile diameter - 1200 mm)	metre	9092.00
		Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=500 mm)	metre	2953.00
		Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=750 mm)	metre	5364.00
		Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=1000 mm)	metre	9132.00
		Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 300 mm x 300 mm)	metre	1882.00
		Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 500 mm x 500 mm)	metre	3423.00
		Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 750 mm x 750 mm)	metre	6784.00
		Driven vertical steel piles complete as per drawing and & Technical Specification (Section of the pile - H Section steel column 400 x 250 mm (ISHB Series))	metre	7494.00
		Driven vertical steel piles complete as per drawing and & Technical Specification (Section of the pile - H Section steel column 450 x 250 mm (ISHB Series))	metre	8452.00
16.92		**Pile load test on single vertical pile in accordance with IS:2911(Part-IV).**		
		a) Initial and Routine load test.	Ton	330.00
		b) Lateral load test	Ton	5500.00
16.93		**(I) Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification.**		
		A RCC Grade M20		
		(i) Using Concrete Mixer	cum	7275.00
		(ii) Using Batching Plant, Transit Mixer and Concrete Pump	cum	7184.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		B	RCC Grade M25		
		(i)	Using concrete mixer.	cum	7830.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	9734.00
		C	RCC Grade M30		
		(i)	Using concrete mixer.	cum	7900.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	9791.00
		D	RCC Grade M35		
		(i)	Using concrete mixer.	cum	8047.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	9951.00
16.93		**(II)**	Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification including providing plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999.		
		A	RCC Grade M20		
		(i)	Using Concrete Mixer	cum	7961.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	9852.00
		B	RCC Grade M25		
		(i)	Using concrete mixer.	cum	8640.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10544.00
		C	RCC Grade M30		
		(i)	Using concrete mixer.	cum	8725.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10616.00
		D	RCC Grade M35		
		(i)	Using concrete mixer.	cum	8902.00
		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	10807.00
16.94		Levelling course for Pile cap		cum	6015.00
16.95		**Reinforcement in Foundation: Supplying, fitting and placing conforming to IS:1786 TMT reinforcement bar Fe500 in foundation complete as per drawing and technical specifications**			

Item No.	Ref. of MORT&H	Description	Unit	Rate
		(a) TMT - IS 1786 (Fe-500 D) from Primary Producer like TATA/SAIL/SHYAM STEEL/ESSER STEEL/JINDAL STEEL/RINL etc.	tonne	55355.00
		(b) TMT - IS 1786 (Fe-500 D) from other ISI approved Secondary Producer like SAI/BISCON/ THERMAX or equivalent.	tonne	47388.00
16.96		Supplying, fitting and placing MS reinforcement bar Fe-250 of other make complete in foundation as per drawing and technical specification	tonne	58131.00
		SUB-STRUCTURE		
16.97		Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications	cum	7331.00
16.98		Pointing with cement mortar (1:3) on brick work in substructure as per Technical specifications	sqm	62.00
16.99		Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical specifications	sqm	130.00
16.99.1		Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications		
		A Random Rubble Masonry	cum	4702.00
		B Coursed rubble masonry (first sort)	cum	4935.00
		C Ashlar masonry (first sort)	cum	5257.00
16.99.2(N)		Plain/Reinforced cement concrete, in sub structure complete as per drawing and technical specification and steel shuttering formwork		
		(N) Without plasticiser		
		A PCC Grade M15	cum	6103.00
		Height upto 5m		
		B PCC Grade M20	cum	6772.00
		Height upto 5m		
		C PCC Grade M25		
		a Height upto 5m		
		Case I Using concrete Mixer	cum	7331.00
		Case II With Batching Plant, Transit Mixer and Concrete Pump	cum	7344.00
		b Height 5m to 10m		
		Case I Using concrete Mixer	cum	7598.00
		Case II With Batching Plant, Transit Mixer and Concrete Pump	cum	7612.00
		c Height above 10m		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Case I	Using concrete Mixer	cum	7931.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7945.00
		D	**PCC Grade M30**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	7392.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7285.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	7661.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7549.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	7997.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7881.00
		E	**RCC Grade M20**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	6972.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	6867.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	7225.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7116.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	7542.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7428.00
		F	**RCC Grade M25**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	7539.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7432.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	7786.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7676.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	8156.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8040.00
		G	**RCC Grade M30**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	7572.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7468.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	7785.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7679.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	8157.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8045.00
		H	**RCC Grade M35**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	7726.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7623.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	7895.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7789.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	8148.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8038.00
		(P)	**With plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser(Masterplast ACPL or equivalent) conforming to IS-9103-1999**		
		A	**PCC Grade M15**		
			Height upto 5m	cum	6803.00
		B	**PCC Grade M20**		

Item No.	Ref. of MORT&H	Description		Unit	Rate
			Height upto 5m	cum	7472.00
		C	**PCC Grade M25**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	8188.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8087.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	8486.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7612.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	8858.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8749.00
		D	**PCC Grade M30**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	8262.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8154.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	8562.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8450.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	8937.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8821.00
		E	**RCC Grade M20**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	7672.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7567.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	7951.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	7842.00
		c	Height above 10m		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		Case I	Using concrete Mixer	cum	8300.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8186.00
		F	**RCC Grade M25**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	8403.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8297.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	8678.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8569.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	9090.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8976.00
		G	**RCC Grade M30**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	8444.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8340.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	8682.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8575.00
		c	Height above 10m		
		Case I	Using concrete Mixer	cum	9020.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8909.00
		H	**RCC Grade M35**		
		a	Height upto 5m		
		Case I	Using concrete Mixer	cum	8632.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8528.00
		b	Height 5m to 10m		
		Case I	Using concrete Mixer	cum	8820.00
		Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	8714.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		c Height above 10m		
		Case I Using concrete Mixer	cum	9102.00
		Case II With Batching Plant, Transit Mixer and Concrete Pump	cum	8993.00
16.99.3		**Supplying, fitting and placing conforming to IS:1786 TMT reinforcement bar Fe-500 from primary producer like TATA/SAIL/SHYAM STEEL/ESSER STEEL/JINDAL STEEL/ RINL etc. in Sub-Structure complete as per drawing and technical specifications**		
		(a) TMT - IS 1786 (Fe-500 D) from Primary Producer like TATA/SAIL/SHYAM STEEL/ESSER STEEL/JINDAL STEEL/RINL etc.	tonne	55477.00
		(b) TMT - IS 1786 (Fe-500 D) from other ISI approved Secondary Producer like SAI/BISCON/ THERMAX or equivalent.	tonne	47510.00
16.99.4		Supplying, fitting and placing conforming to IS: 1786 (Fe-500) MS reinforcement complete in sub-structure as per drawing and technical specification	tonne	58359.00
16.99.5		Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specification.	each	305.00
16.99.6		Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification		
		A Granular material	cum	1782.00
		B Sandy material	cum	1302.00
16.99.7		Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size toeards the wall and provided over the entire surfaces behind the abutement, wing wall and return wall to the full height compacted to firm condition complete as per drawing and technical specification.	cum	1738.00
16.99.8		Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	tonne capacity	510.00
16.99.9		Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	tonne capacity	591.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.99.10		Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MORT&H specification.	tonne capacity	221.00
16.99.11		Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	1.01
16.99.12		Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.	tonne capacity	216.00
16.99.13		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 stainlesssteel matting surfaces, complete assembly to be of cast steel/fabricated structural steel, meatal and elastomer elements to be as per IRC:83 part-I &II respectively and parts conforming to BS:5400, section 9.1 & 9.2 and clause 2006 of MORTH&S Specification complete as per drawing and approved technical specification.	tonne capacity	187.00
		SUPER-STRUCTURE		
16.99.14		**Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification' including steel shuttering formwork.**		
		(N) Without Plasticiser		
		A RCC Grade M20		
		Case I Using Concrete Mixer		
		(i) For solid slab super-structure		
		a Height upto 5m	cum	8394.00
		b Height 5m to 10m	cum	8744.00
		c Height above 10m	cum	9094.00
		(ii) For T-beam & slab		
		a Height upto 5m	cum	8744.00
		b Height 5m to 10m	cum	9094.00
		c Height above 10m	cum	9444.00
		Case II Using Batching Plant, Transit Mixer and Concrete Pump		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	6702.00
		b	Height 5m to 10m	cum	6981.00
		c	Height above 10m	cum	7260.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	6981.00
		b	Height 5m to 10m	cum	7260.00
		c	Height above 10m	cum	7539.00
		B	**RCC Grade M25**		
		Case I	**Using Concrete Mixer**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7367.00
		b	Height 5m to 10m	cum	7674.00
		c	Height above 10m	cum	7981.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7674.00
		b	Height 5m to 10m	cum	7981.00
		c	Height above 10m	cum	8288.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7231.00
		b	Height 5m to 10m	cum	7532.00
		c	Height above 10m	cum	7834.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7532.00
		b	Height 5m to 10m	cum	7834.00
		c	Height above 10m	cum	8135.00
		C	**RCC Grade M 30**		
		Case I	**Using Concrete Mixer**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7458.00
		b	Height 5m to 10m	cum	7769.00
		c	Height above 10m	cum	8079.00
		(ii)	**For T-beam & slab**		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		a	Height upto 5m	cum	7769.00
		b	Height 5m to 10m	cum	8079.00
		c	Height above 10m	cum	8390.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump.**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7301.00
		b	Height 5m to 10m	cum	7605.00
		c	Height above 10m	cum	7909.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7605.00
		b	Height 5m to 10m	cum	7909.00
		c	Height above 10m	cum	8214.00
		D	**RCC/PSC Grade M35**		
		Case 1	**Using concrete mixer.**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7469.00
		b	Height 5m to 10m	cum	7786.00
		c	Height above 10m	cum	8102.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7786.00
		b	Height 5m to 10m	cum	8102.00
		c	Height above 10m	cum	8419.00
		(iii)	**For box girder and balanced cantilever**		
		a	Height upto 5m	cum	8735.00
		b	Height 5m to 10m	cum	9368.00
		c	Height above 10m	cum	10001.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7310.00
		b	Height 5m to 10m	cum	7620.00
		c	Height above 10m	cum	7930.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7620.00
		b	Height 5m to 10m	cum	7930.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	Height above 10m	cum	8239.00
		(iii)	**For box girder and balanced cantilever**		
		a	Height upto 5m	cum	8549.00
		b	Height 5m to 10m	cum	9169.00
		c	Height above 10m	cum	9788.00
		E	**PSC Grade M-40**		
		Case 1	Using concrete mixer.		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7716.00
		b	Height 5m to 10m	cum	8037.00
		c	Height above 10m	cum	8359.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8037.00
		b	Height 5m to 10m	cum	8359.00
		c	Height above 10m	cum	8680.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7387.00
		b	Height 5m to 10m	cum	7700.00
		c	Height above 10m	cum	8013.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7700.00
		b	Height 5m to 10m	cum	8013.00
		c	Height above 10m	cum	8326.00
		(iii)	**For box girder and balanced cantilever**		
		a	Height upto 5m	cum	8639.00
		b	Height 5m to 10m	cum	9265.00
		c	Height above 10m	cum	9891.00
		F	**PSC Grade M-45**		
		(i)	**For solid slab/voided slab super-structure**		
		a	Height upto 5m	cum	7566.00
		b	Height 5m to 10m	cum	7892.00
		c	Height above 10m	cum	8218.00
		(ii)	**For I-beam & slab including launching of precast girders by launching truss upto 40 m span**		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		a	Height upto 5m	cum	7892.00
		b	Height 5m to 10m	cum	8218.00
		c	Height above 10m	cum	8545.00
		(iii)	**For cast-in-situ box girder, segmental construction and balanced cantilever**		
		a	Height upto 5m	cum	8871.00
		b	Height 5m to 10m	cum	9523.00
		c	Height above 10m	cum	10175.00
		G	**PSC Grade M-50**		
		(i)	**For cast-in-situ box girder, segmental construction and balanced cantilever**		
		a	Height upto 5m	cum	9059.00
		b	Height 5m to 10m	cum	9730.00
		c	Height above 10m	cum	10401.00
		H	**PSC Grade M- 55**		
		(i)	**For cast-in-situ box girder, segmental construction and balanced cantilever**		
		a	Height upto 5m	cum	9455.00
		b	Height 5m to 10m	cum	10156.00
		c	Height above 10m	cum	10856.00
		(P)	**With plasticiser (Masterplast PL-1/SPL-2 or equivalent), air entraining and water reducing plasticiser (Masterplast PAE or equivalent) and accelerating plasticiser (Masterplast ACPL or equivalent) conforming to IS-9103-1999.**		
		A	**RCC Grade M20**		
		Case I	**Using Concrete Mixer**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7838.00
		b	Height 5m to 10m	cum	8165.00
		c	Height above 10m	cum	8492.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8165.00
		b	Height 5m to 10m	cum	8492.00
		c	Height above 10m	cum	8818.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump**		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	7664.00
		b	Height 5m to 10m	cum	7983.00
		c	Height above 10m	cum	8302.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	7983.00
		b	Height 5m to 10m	cum	8302.00
		c	Height above 10m	cum	8622.00
		B	**RCC Grade M25**		
		Case I	**Using Concrete Mixer**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8404.00
		b	Height 5m to 10m	cum	8754.00
		c	Height above 10m	cum	9104.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8754.00
		b	Height 5m to 10m	cum	9104.00
		c	Height above 10m	cum	9454.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8268.00
		b	Height 5m to 10m	cum	8613.00
		c	Height above 10m	cum	8957.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8613.00
		b	Height 5m to 10m	cum	8957.00
		c	Height above 10m	cum	9302.00
		C	**RCC Grade M 30**		
		Case I	**Using Concrete Mixer**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8514.00
		b	Height 5m to 10m	cum	8868.00
		c	Height above 10m	cum	9223.00
		(ii)	**For T-beam & slab**		

Item No.	Ref. of MORT&H	Description		Unit	Rate
		a	Height upto 5m	cum	8868.00
		b	Height 5m to 10m	cum	9223.00
		c	Height above 10m	cum	9578.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump.**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8356.00
		b	Height 5m to 10m	cum	8705.00
		c	Height above 10m	cum	9053.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8705.00
		b	Height 5m to 10m	cum	9053.00
		c	Height above 10m	cum	9401.00
		D	**RCC/PSC Grade M35**		
		Case 1	**Using concrete mixer.**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8547.00
		b	Height 5m to 10m	cum	8909.00
		c	Height above 10m	cum	9271.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8909.00
		b	Height 5m to 10m	cum	9271.00
		c	Height above 10m	cum	9633.00
		(iii)	**For box girder and balanced cantilever**		
		a	Height upto 5m	cum	9995.00
		b	Height 5m to 10m	cum	10720.00
		c	Height above 10m	cum	11444.00
		Case II	**Using Batching Plant, Transit Mixer and Concrete Pump**		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8387.00
		b	Height 5m to 10m	cum	8743.00
		c	Height above 10m	cum	9098.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8743.00
		b	Height 5m to 10m	cum	9098.00

Item No.	Ref. of MORT&H	Description		Unit	Rate
		c	Height above 10m	cum	9454.00
		(iii)	**For box girder and balanced cantilever**		
		a	Height upto 5m	cum	9809.00
		b	Height 5m to 10m	cum	10520.00
		c	Height above 10m	cum	11231.00
		E	**PSC Grade M-40**		
		Case 1	Using concrete mixer.		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8832.00
		b	Height 5m to 10m	cum	9200.00
		c	Height above 10m	cum	9568.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	9200.00
		b	Height 5m to 10m	cum	9568.00
		c	Height above 10m	cum	9936.00
		Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
		(i)	**For solid slab super-structure**		
		a	Height upto 5m	cum	8484.00
		b	Height 5m to 10m	cum	8844.00
		c	Height above 10m	cum	9204.00
		(ii)	**For T-beam & slab**		
		a	Height upto 5m	cum	8844.00
		b	Height 5m to 10m	cum	9204.00
		c	Height above 10m	cum	9563.00
		(iii)	**For box girder and balanced cantilever**		
		a	Height upto 5m	cum	9923.00
		b	Height 5m to 10m	cum	10642.00
		c	Height above 10m	cum	11361.00
		F	**PSC Grade M-45**		
		(i)	**For solid slab/voided slab super-structure**		
		a	Height upto 5m	cum	8733.00
		b	Height 5m to 10m	cum	9110.00
		c	Height above 10m	cum	9486.00
		(ii)	**For I-beam & slab including launching of precast girders by launching truss upto 40 m span**		

Item No.	Ref. of MORT&H	Description	Unit	Rate
		a Height upto 5m	cum	9110.00
		b Height 5m to 10m	cum	9486.00
		c Height above 10m	cum	9862.00
		(iii) For cast-in-situ box girder, segmental construction and balanced cantilever		
		a Height upto 5m	cum	10239.00
		b Height 5m to 10m	cum	10992.00
		c Height above 10m	cum	11745.00
		G PSC Grade M-50		
		(i) For cast-in-situ box girder, segmental construction and balanced cantilever		
		a Height upto 5m	cum	10490.00
		b Height 5m to 10m	cum	11267.00
		c Height above 10m	cum	12044.00
		H PSC Grade M- 55		
		(i) For cast-in-situ box girder, segmental construction and balanced cantilever		
		a Height upto 5m	cum	11001.00
		b Height 5m to 10m	cum	11816.00
		c Height above 10m	cum	12631.00
16.99.15		**Reinforcement in Super-structure: Supplying, fitting and placing conforming to IS:1786 TMT reinforcement bar Fe500 in Super-Structure complete as per drawing and technical specifications**		
		(a) TMT - IS 1786 (Fe-500 D) from Primary Producer like TATA/SAIL/SHYAM STEEL/ESSER STEEL/JINDAL STEEL/RINL etc.	tonne	56319.00
		(b) TMT - IS 1786 (Fe-500 D) from other ISI approved Secondary Producer like SAI/BISCON/ THERMAX or equivalent.	tonne	48352.00
16.99.16		High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	218132.00
16.99.17		Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	11203.00
16.99.18		**Mastic Asphalt**		
		(A) Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen	sqm	406.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope aftering cleaning the surface, including providing antiskid surface with bitumen pre coated fine grained hard stone shipping of 9.5mm nominal size at the rate of .005 cum per 10sqm and at approximate spaciong of 10cm center to center in both directions, pressed into surfaces when temperature of the surfaces not less than 100 degC. , protuding 1mm to 4mm over mastic surfaces, all complete as per clause 515.		
		(B) Providing and laying Bituminous wearing course comprising of tack coat with bitumen emulsion CSS-1h as per APWD SOR item no 5.2 & MOSRT&H Specification Nos 503 0.6mm thick mastic asphalt as per APWD SOR item no 14.5 & MOSRT&H Specification Nos 515 & 2702 and 2 layers of 25 mm thick Asphalt concrete including of close Graded Premix Surfacing(CGPS) materials with Type -a aggregate as per APWD SOR tem no 5.11 & MOSRT&H Specification Nos 512 including all lead and lift as directed.	sqm	630.00
16.99.19		Construction of precast RCC railing of M30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolurence of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequat space between vertical posts for expansion, complete as per approved drawings and technical specifications.	metre	1724.00
16.99.20		Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolurence of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequat space between vertical posts for expansion, complete as per approved drawings and technical specifications.	metre	1683.00
16.99.21		Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification	metre	3846.00
16.99.22		Drainage Spouts complete as per drawing and Technical specification	Each	6353.00
16.99.23		PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	5548.00
16.99.24		**Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification**		
		(a) TMT - IS 1786 (Fe-500 D) Primary Producer	cum	10577.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		(b) TMT - IS 1786 (Fe-500 D) Secondary Producer with other make.	cum	10526.00
16.99.25		**Precast - pretensioned Girders** (Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications)	cum	27006.00
16.99.26		**Providing and fixing Helical pipes in voided concrete slabs**	metre	316.00
16.99.27		**Crash Barriers** (The rate analysis for rigid crash barrier in reinforced cement concrete, semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.)		
16.99.26		**Painting on concrete surface** (Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 Sq.m.)		
		(A) For Plain surface	sqm	49.00
		(B) For RCC Railing	RM	175.00
16.99.27		**Burried Joint** (Providing and laying a burried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised wieldable structural steel plate as per IS: 2062, placed symmetrical to centre line of the joint, resting freely over the top surfaces of the deck concrete, welding of 8mm dia, 100mm long galvanized nails spaced 300mm C/C along the center line of the plate , all as specified in clause 2604.)	metre	1298.00
16.99.28		**Filler joint**		
		(i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.	metre	1084.00
		(ii) Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.	metre	302.00
		(iii) Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specification.	metre	273.00
		(iv) Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight	metre	21.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
16.99.29		**Asphaltic Plug joint** (Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate 200mmX 6mm of wiedable structural steel conforming to IS:2062, asphaltic plug consist of polymer modified bitumen binder, carefully selected singl;e size aggregate of 12.5mm nominal size and heat resistant foam caulking/ backer rod, all as per approved drawing and specifications.)	metre	1235.00
16.99.30		**Elastomeric Slab Seal Expansion Joint** (Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 mm, complete as per approved drawings and standard specification to be installed by the manufacture/supplier or their authorisedrepresentative ensuring compliance to the manufacturers instructios for installation and clause 2506 of MORTS&H specification of bridge works.)	metre	20881.00
16.99.31		**Compression Seal Joint** (Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the gap with special adhesive binder to cater for a horizontal movement up to 40mm and vertical movement of 3mm.)	metre	12402.00
16.99.32		**Strip Seal Expansion Joint** (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instruction for installation).	metre	5884.00
16.99.33		**Modular Strip / Box Seal Joint** (Providing and laying of a modular strip Box steel expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, complete as per approved drawings and standard specifications to be installed by teh manufacture/supplier or their authorised representative ensuring compliance to the manufacturer's instruction for installation.)	metre	92848.00
16.99.34		**Modular Strip / Box Seal Joint** (Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, complete as per approved drawings and standard specifications to be installed by the manufactu/supplier or their authorised representative ensuring compliance	metre	157109.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		to the manufacturer's instruction for installation.)		
16.99.35		**Extra for providing water proofing compound** (Providing and applying cement mortar(1 cement 3 sand) with STRUCO LATEX or its equivalent as per specification and as directed by the Department	sqm	156.00
16.99.36		**Extra for providing water proofing compound** (Cleaning the surface and applying two coats ofARMOURCRETE or its equivalent as per specification and as directed by the Department	sqm	241.00

Chapter-17
New Technology

Item No.	Ref. of MORT&H	Description	Unit	Rate
17.1		**Open - Graded Premix Surfacing (specially for shaded areas)** Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using Bitumen Emulsion With cold mix Binder Ezee PC (MS) (As per IRC : SP : 100 -2014) to required line, grade and level to serve as wearing course on a per Technical Specification and through credible technology partners duly licensed by CRRI.	sqm	164.00
17.2		**Seal coat with Cold mix Binder (specially for shaded areas) -** Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels grade and cross fall using Type A,Type B and Type C as per Technical specification clause 510.With cold mix Binder Ezee PC (MS) (As per IRC : SP : 100 -2014)and through credible technology partners duly licensed by CRRI.	sqm	35.00
17.3		Construction of Sub-Base/Base of road pavement by making use of **EVOCRETE CCL Soil Modifier (GERMAN) technology** by re-using the existing/in-situ soil. Profiling the road to the required design standard followed by spreading of 7% of O.P.C. 43 Grade cement of stabilized soil (Variable depending upon soil properties) , then spreading 2 % EVOCRETE additive of 7 % OPC and pulverising the cement , additive & profiled soil/pavment material with help of Recycler/Stabilizer including moisturing to OMC. On completion of pulverisation re-garding, profiling to required grade/camber with motor grader & compacting simaltaneously with 14 tonne vibratory roller to achieve 95% degree of compaction as directed by the Engineer-in-charge & finally irrigating the stabilized surface for next 48 hours.		
		I **20.0cm thick Sub-Base & Base with Evocrete and Cement etc.**	cum	3294.00
17.4		**Bio Enzyme Soil Stabilizer Terrazyme under IRC accredited new Technology**		
		I Providing of 1st layer of Bioenyme based soil stabilised layer to a required thickness as per manufacture design with a existing soil, by ripping open the existing road formation and treating it with TerraZyme in the ratio 1L for 12.6 cum soil spreading in uniform layer with motor grader on prepared surface , mixing by mix in place method with rotavator at OMC and compacting with smooth wheel roller to achieve the desired density complete as per technical	cum	1352.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		specification incl all labour , equipments etc as per direction of the Engineer -in -charge of the work. The soil will have PI between 7 and 18% and clay % by hydrometry should be more than 15% and less than 40%.		
		II Providing of 2nd layer of Bioenyme based soil stabilised layer to a required thickness as per manufacture design with local soil material/ gravel/murram, having CBR greater than 8% and treating it with Terrazyme in the ratio 1L for 15.0 cum soil with 25% 40mm crusher broken metal in design mix, spreading in uniform layer with tractor grader on prepared surface, mixing by mix in place method with rotavator at OMC and compacting with smooth wheel roller to achieve the desired densiality complete as per technical specification including all labour, materials like soil and metal, equipments etc. complete as per direction of the Engineer-in-charge of the work. The soil will have PI between 7 and 13% and clay % by hydrometry should be more than 15% and less than 30%.	cum	1389.00
17.5		**Soil Stablized subbase/ base using Roadstab**		
		I Providing of soil stabilized subase/base course by providing,laying and spreading ordinary soil on a prepared subgrade,palverising,adding the designed quantity of Roadstab mixing compound adding 4% cement, mixing at OMC,with rotavator grading with motor grader and compacting with the road roller/vibratory roller at OMC to acheive the desired unconfined compression strength and to form a layer of subbase and necessary curing	cum	3731.00
17.6		**RBI Grade 81 Treated Base Layer**		
		A For Selected soil having CBR 5% to 6%		
		I Providing, laying, spreading and compacting Soil conforming to engineering requirement and Aggregate in base layer including in situ mixing of 30% Aggregatesof size 22.4 mm to 2.56 mm (for WMM as per page 154 of Assam SOR 2016-17 for rural road & table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 20% Stone dust+46% in-situ soil (CBR 5% to 6%) + 4% RBI Grade-81 (a soil stabilizer cum pavement material) , speading in uniform layers with motor grader on prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the	cum	4113.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		required density at OMC for preparing the base layer including all cost of materials , labour, HOM of machinery, etc. complete as per specifications and EIC directions.		
		B RBI Grade-81 FOR EXISTING IN-SITU SOIL HAVING CBR 5% TO 6%		
		Providing, laying, spreading and compacting including mixing of In-situ Soil (CBR 5% to 6%), Aggregate size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for Rural Roads and Table 400.13 & Technocal Specification clause 406 of MORT&H 5th Revision) and Stone Dust with Soil Stabiliser and Pavement Material RBI Grade 81 (SRSPL), spreading in uniform layers with motor grader on prepared sub-base / sub-grade including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the Base / Sub-base layer. Including basic cost of materials, labour, HOM of machinary, etc. as per specifications and EIC directions. The rate mentioned here are exclusive of carriage charge of Aggregates / Stone Dust / Selected Soil from quarry to site. The carriage charge will be added to these rates to arrive at final rate.		
		I Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 30% Stone Dust + 36% In-Situ Soil (CBR 5 % to 6 %) + 4 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	4190.00
		II Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 20% Stone Dust + 46% In-Situ Soil	cum	4113.00

Item No.	Ref. of MORT&H		Description	Unit	Rate
			(CBR 5 % to 6 %) + 4 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions		
		III	Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 30% Stone Dust + 36.25 % In-Situ Soil (CBR 5 % to 6 %) + 3.75 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3983.00
		IV	Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 20% Stone Dust + 46.25% In-Situ Soil (CBR 5 % to 6 %) + 3.75 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3906.00
		V	Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56	cum	3776.00

Item No.	Ref. of MORT&H		Description	Unit	Rate
			mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 30% Stone Dust + 36.5 % In-Situ Soil (CBR 5 % to 6 %) + 3.5 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions		
		VI	Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 20% Stone Dust + 46.5% In-Situ Soil (CBR 5 % to 6 %) + 3.5 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3700.00
		VII	**RBI GRADE 81 - 2%**		
			Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in sub base layer including in situ mixing of 30% Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 20% Stone Dust + 48% In-Situ Soil (CBR 5 % to 6 %) + 2 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC	cum	2380.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		directions		
		C For Selected Soil Having CBR 7% to 9%		
		RBI GRADE -81—4%		
		Providing , laying spreading and compacting inncluding in situ mixing of selected soil (CBR 7% to 9%), Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 408 of MORTH 5th Revision) & Stone Dust with Soil Stabilizer and PavementMaterial RBI Grade 81 (SRSPL) , spreading in uniform layers with Motor grader on a prepared subbase including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the base layer including basic cost of materials, labour,HOM of machinearyetc, complete as per specification and EIC directions.The rates mentioned here are Exclusive of carriage charges for Agrregate/ Stone Dust/ Setected Soil from quarry to site . The carriage charges will be added to these rates to arrive at final rate.Various combinations of in-situ soil/selected soil, aggregate and RBI percentages have been given, The optimum combination would depend upon the following factors:1. In-situ soil/selected soil (as applicable), CBR, and PI2. Traffic Category3. Distance of Quarry from site		
		I Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 45 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 51 % Selected Soil (CBR 7 % to 9 %) + 4 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	4151.00
		II Providing, laying, spreading and compacting Soil conforming to engineering requirements	cum	4114.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		and Aggregate in base course including in situ mixing of 30 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 15 % Stone Dust + 51 % Selected Soil (CBR 7 % to 9 %) + 4 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions		
		III Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 45 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 51.25 % Selected Soil (CBR 7 % to 9 %) + 3.75 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3945.00
		D **RBI GRADE 81-3.75%**		
		I Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 30 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 15 % Stone Dust + 51.25 % Selected Soil (CBR 7 % to 9 %) + 3.75 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including	cum	3908.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions		
		II Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 45 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 51.5 % Selected Soil (CBR 7 % to 9 %) + 3.5 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3738.00
		RBI GRADE 81-3.5%		
		III Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 30 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 15 % Stone Dust + 51.5 % Selected Soil (CBR 7 % to 9 %) + 3.5 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3701.00
		RBI GRADE 81-2%		
		IV Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 30 % Aggregate of size 22.4 mm to 2.56 mm (for WMM as per page 154 of ASSAM SOR 2016-17 for rural roads & Table 400.13 & technical specification clause 406 of MORTH 5th Revision) + 15 % Stone Dust + 53 % Selected Soil (CBR 7 % to 9 %) + 2 % RBI Grade-81 (a soil	cum	2382.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions		
		E **40% AGGREGATE 20MM + SOIL (CBR 7% TO 9%) + RBI GRADE-81(SRSPL)**		
		Providing,laying,spreading and compacting including in situ mixing of selected soil aggregate of size 20mm with soil stabiliser and pavemebt material RBI Grade-81 (SRSPL), spreading in uniform layers with Motor grader on a prepared sub base icluding watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the base layer. Including basic cost of materials, labour, HOM machinery,etc complete as per specifications and EIC directions. The rates mentioned here are exclusive of carriage charges for aggregate/ stone dust/selected soil from quarry site. Various combinations of in-situ soil/selected soil(as applicable),aggregate and RBI percentages have been given. The optimum combination would depend upon the following factors :		
		1. In situ soil/selected soil (as applicable) CBR and PI		
		2. Traffic category		
		3. Distance of quarry from site		
		I Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 40% Aggregate (20 mm) + 56% Soil (CBR 7% to 9%) with 4 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	4398.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		II Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 40% Aggregate (20 mm) + 56.25% Soil (CBR 7% to 9%) with 3.75 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	4191.00
		III Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in base course including in situ mixing of 40% Aggregate (20 mm) + 56.5% Soil (CBR 7% to 9%) with 3.5 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	3985.00
		IV Providing, laying, spreading and compacting Soil conforming to engineering requirements and Aggregate in sub base layer including in situ mixing of 40% Aggregate (20 mm) + 58% Soil (CBR 7% to 9%) with 2% RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared base including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the required density at OMC for preparing the base Layer Including all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	2666.00
17.7		Providing, laying, spreading and compacting including in situ mixing of In-Situ 94 % Soil + 4 % PI Reducing Agent with 2 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the Sub Base/	cum	2400.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		Subgrade.Including basic cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions.		
17.8		Providing, laying, spreading and compacting including in situ mixing of In-Situ 93.5 % Soil + 4 % PI Reducing Agent with 2.5 % RBI Grade-81 (a soil stabilizer cum pavement material), spreading in uniform layers with motor grader on a prepared including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the Sub Base/ Subgrade.Including basic cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions.	cum	2754.00
17.9		Providing, laying, spreading and compacting including in situ mixing of 98 % In-Situ Soil (PI < = 10) with 2 % RBI Grade-81 (Soil Stabiliser and Pavement Material), spreading in uniform layers with Motor grader on a prepared surface including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the Subgrade.Including basic cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions.	cum	1841.00
17.10		Providing, laying, spreading and compacting including in situ mixing of 97.5 % In-Situ Soil (PI < = 10) with 2.5 % RBI Grade-81 (Soil Stabiliser and Pavement Material), spreading in uniform layers with Motor grader on a prepared surface including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the Subgrade.Including basic cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions.	cum	2195.00
17.11		Providing, laying, spreading and compacting including in situ mixing of 98 % Selected Soil (PI < = 10) with 2 % RBI Grade-81 (Soil Stabiliser and Pavement Material), spreading in uniform layers with Motor grader on a prepared surface including watering and compacting with 10 to 12 tonne single drum vibratory roller to achieve the desired density for preparing the Subgrade.Including basic cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions .	cum	1841.00
17.12		**ZYCOSOIL NANO TECHNOLOGY**		
		A Water Proofing		
		I Waterproofing on top compacted (as per relevant MoRD specification) sub Grade soil base, shoulders with Organosilane Nanotechnology & nano acrylic co-polymer with water (<1000 ppm TDS) in the ratio of 1	sqm	14.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		kg Organosilane Nanotechnology:1 kg nano acrylic co-polymer :200 liter water spray @ 3 liter /sqm in two spray applications (1.5 liter + 1.5 liter) as per direction of the Engineer-in-charge.		
		II **Stabilized Sub-base / Base:** Providing, Laying, Spreading and Compacting in-situ/borrow area soil of CBR >5% mixed with / without 30% crushed aggregate / muruum / GSB Grade 1 as per mix design. Application: (1) Rip and loosen soil with excavator / tractor operated ripper and scarify with tractor operated rotavator upto depth of 200 mm. Mix aggregates as per mix design. (2) Apply 1 kg /cum organosilane Nanotechnology mixed in OMC water (<1000 ppm TDS) on loose soil. Scarify the treated and allow it to dry. (2) Spread Cement 3% by weight of soil on the silane treated and dry soil. (3) Apply 1 kg/cum of nano acrylic Co-Polymer mixed in OMC water (<1000 ppm TDS), on the above treated soil mixed with cement. Scarify and grade the soil. (4) Spread 13.2 and down size aggregates on the graded soil surface to form 20-25 mm thick soil-aggregate layer.(5).Compact the stabilized soil-aggregate base with 8 to 10 tonne vibratory roller to achieve stone embedded layer with the desired density.(6) Waterproof the top of the compacted stabilized base with organosilane & nano acrylic Polymer in the ratio of 1 kg organosilane :1 kg nano acrylic Co-Polymer : 200 liter water (<1000 ppm TDS) @ 3ltrs/sqm in two spray applications (1.5 ltrs. + 1.5 ltrs.).Rates include all material, labour, hire charges of machinery etc. as per MoRD specifications & direction of Engineer-in-Charge.	cum	2197.00
		III ***Prime Coat (with silane Nanotechnology)***		
		(i) ***Low porosity***		
		Prime Coat : Preparing and applying of water soluble organo silane nanotechnology (for bitumen emulsion application, IRC approved) with cationic bitumen emulsion CSS1 and water (<1000 ppm TDS) in the ratio of 1 kg organo silane : 100 kg cationic bitumen emulsion CSS1 : 200 liter water . Mixing & Spraying : Take 1 kg of organo silane nanotechnology and add in 200 liter water while filling water in tanker/drum and then add 100 kg cationic bitumen emulsion under circulation. Mix the solution completely. Spray the solution @ 1 liter per sqm on compacted stone base. Rates including all materials, labour,	sqm	21.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		hire Charges of machery etc. complete as per MoRD specifications & direction of Engineer-in-Charge.		
17.13		**20mm thick Open-Graded Premix Carpet using Bituminous (penetration grade) Binder Using Nanotechnology.(** Providing, laying and rolling of open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm stone aggregates using S-65 penetration grade bitumen mixed with silane nanotechnology @ 0.1% by weight of bitumen S-65 grade @ 14.6 kg/10 sqm to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable hot mix plant, laying and rolling with a three wheel 80-100 kN static roller capacity, finished to required level and grades to be followed by seal coat of Type D as per Technical Specification Clause 508 of MoRD and as per direction of Engineer-in-Charge**.)**		
		Bitumen (S-90)	sqm	124.00
17.14		**Seal Coat(with Nanotechnology) (**Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type D as per Technical Specification Clause 510 of MORD with S-65grade bitumen mixed with organosilane nanotechnology @ 0.1% by weight of S-65 bitumen binder laid as per direction of Engineer-in-Charge**.)**		
		A By Mechanical Means		
		I Case -3 : Type C: Bitumen (S-90)	sqm	47.00
17.15		**EVOCRETE TECHNOLOGY**		
		A Stabilization/soil binding of in-situ soil of sub-base/base course using EvocreteCCL soil stabilizer (Construction of Sub-Base/Base of road pavement by making use of EVOCRETE CCL Soil Modifier (GERMAN) technology by re-using the existing/in-situ soil. Profiling the road to the required design standard followed by spreading of 7% of O.P.C. 43 Grade cement of stabilized soil (Variable depending upon soil properties) , then spreading 2 % EVOCRETE additive of 7 % OPC and pulverising the cement , additive & profiled soil/pavment material with help of Recycler/Stabilizer including moisturing to OMC. On completion of pulverisation re-garding, profiling to required grade/camber with motor grader & compacting simaltaneously with 14 tonne vibratory roller to achieve 95% degree of compaction as directed by the Engineer-in-charge & finally irrigating the stabilized surface for next 48 hours**)**		

Item No.	Ref. of MORT&H	Description	Unit	Rate
		I **20.0cm thick Sub-Base & Base with Evocrete and Cement etc.**	cum	3304.00
17.16		**Cell Filled Concrete Pavement**		
		I Construction of plastic cell filled cement concrete pavement, thickness 100mm (as per design), over a prepared sub base, with 53 grade Ordinary Portland Cement(OPC) or any other type as per Clause 1501.2.4 M30 (Grade), coarse and fine aggregates conforming to IS : 2386, mixing in a concrete mixer of not less than 0.2 cum capacity and appropiate weigh batcher using approved mix design (As per IRC:44-2008), laid in the cells made of high density polythyne sheets of thickness 0.22mm to about 0.25mm,side 150mm and depth 100mm of approximate weight of 1250 kg for a road of 3.75m wide and 1.00km , putting iron spike of 200mm long at the end corners of the cells and using nylon threads passing through the cells 10 mm below the top of the cells, in approved fixed side formwork (steel channe, wedges, steel plates including levelling the formwork as per drawing),maitaining camber of about 3 to3.5%, spreading the concrete with sholvels, rakes, compacted using needle, scareed and plate vibrators and finished in continuous operation, curing of concrete slabs for 14- days, curing compound (where specified) and water finishing to lines and grade as per drawing and Technical Specification of Cell filled Concrete Pavement Published by NRRDA		
		a Rate analysis is being carried out for Cell filled concrete pavement of 3.75m and 25m in width and length. As per the requirement of DIY on cell filled concrete block, the following are the requirements for a pavement of 3.75m and 25m in width and length that can be constructed in **one day**: *200 micron plastic sheet-1 kg=28 meter long of 10cm width-(1.75 sq.m/kg-53.57 Kg for 3.75mx25m) *Labour approximately *Male workers 20Female workers 7Mason 41 number concrete mixerPlate or screed vibrator - 1 no.Mechanical trowelling - 1 no.Max. 25meter length(of width 3.75meter) can be laid in a day (about 10 Cum of CC)	sqm	851.00
17.17		**TENAX 3D GRID TECHNOLOGY**		
		I Supplying and laying of Polypropylene extruded Geogrid with a minimum stiffness	sqm	148.00

Item No.	Ref. of MORT&H	Description	Unit	Rate
		(modulus) at 0.5% strain according to ISO 10319 should be 350x550 Kn/m with apparaent coefficient of friction soil/geosynthetics accroding to EN 13738 must be atleast 1.70(us/ gsy) at 10 KPa load and with a min transversal rib thickness of 2.5 mm and longitudinal rib thickness of 3.6 mm. Aperture of geogrid should be 30mm x 30 mm. Geogrid should not be made of bonding of strands or punching and stretched sheets		
17.18		**Recycling of Bituminous Pavement with Central Recycling Plant**		
		Recycling pavement by cold milling of existing bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30 per cent of the required quantity, hauling and stock piling the reclaimed material near the cent	cum	6199.00
17.19		**Protective coatings to the structures, equipments and machine parts with performance guarantee for 3 years.**		
		I Application cost of two part highbuild 100% solid content system of Cyclophat polyamino based KRAYON KI30021 COROGARD to give protective coating to the substract by giving good bonding to the intermediate coat of Krayon KI 30031 RUST CONVERTOR coat giving the cured coat of crosslinked protective coating from rust , corrosion and weathering effect including cost of material, labour, scafolding, cleaning over application of one part primer fron three part system and two part primer from three part system Krayon KI 30031 RUST CONVERTOR PRIMER and consumable complete as directed by the Engineer-incharge and conforming quality as per IS / IRC Specifications.	sqm	780.00

BASIC RATES
(A) Labour

Sl. No.	Description of Labour	Unit	Rate (Rs.)
L-01	Bhisti	day	244.56
L-02	Bitumen Sprayer	day	244.56
L-03	Blacksmith	day	458.55
L-04	Blaster	day	356.65
L-05	Carpenter 1st Class	day	458.55
L-06	Chips spreader	day	244.56
L-07	Chiseller	day	285.32
L-08	Dresser (Skilled)	day	356.65
L-09	Driller	day	356.65
L-10	Electrician	day	458.55
L-11	Fitter	day	458.55
L-12	Mason (1st class)	day	458.55
L-13	Mason (2nd Class)	day	285.32
L-14	Mate	day	356.65
L-15	Mazdoor (Unskilled)	day	244.56
L-16	Mazdoor (Semi skilled)	day	285.32
L-17	Mazdoor (Skilled)	day	356.65
L-18	Painter (Ist class)	day	458.55
L-19	Plumber	day	458.55
L-20	Surveyor	day	458.55
L-21	White Washer	day	285.32

BASIC RATES
(C) Material

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-001	AC pipe 100 mm	m	60.00
M-002	Aggregate - For 37.5 mm Maximum size - 22.4 mm to 5.6 mm	cum	1,440.50
M-003	Aggregate - For 37.5 mm Maximum size - 45 mm to 22.5 mm	cum	1,623.00
M-004	Aggregate - For 37.5 mm Maximum size - Below 5.6 mm	cum	1,104.00
M-005	Aggregate - For 53 mm Maximum size - 22.5 mm to 5.6 mm	cum	1,140.50
M-006	Aggregate - For 53 mm Maximum size - 63 mm to 45 mm	cum	1,936.00
M-007	Aggregate - For 53 mm Maximum size - Below 5.6 mm	cum	1,104.00
M-008	Aggregate - Grading I (40 mm nominal Size) 10 mm - 5 mm	cum	1,510.00
M-009	Aggregate - Grading I (40 mm nominal Size) 25 mm – 10 mm	cum	1,827.00
M-010	Aggregate - Grading I (40 mm nominal Size) 37.25 mm - 25 mm	cum	1,619.00
M-011	Aggregate - Grading I (40 mm nominal Size) 5 mm and below	cum	1,104.00
M-012	Aggregate - Grading II (19 mm nominal Size) 10 mm - 5 mm	cum	1,846.50
M-013	Aggregate - Grading II (19 mm nominal Size) 25 mm – 10 mm	cum	1,827.00
M-014	Aggregate - Grading II (19 mm nominal Size) 5 mm and below	cum	1,104.00
M-015	Aggregate 10 mm	cum	1,916.00
M-016	Aggregate 20 mm	cum	1,777.00
M-017	Aggregate 40 mm	cum	1,500.00
M-018	Aggregate 10 mm (Natural Gravel)	cum	1,364.00
M-019	Aggregate 20 mm (Natural Gravel)	cum	1,463.00
M-020	Aggregate 40 mm (Natural Gravel)	cum	1,221.00
M-021	Aggregate- Crushable type such as moorum or Gravel for Grading I	cum	1,029.00
M-022	Aggregate- Crushable type such as moorum or Gravel for Grading II	cum	1,029.00
M-023	Aggregate- Crushable type such as moorum or Gravel for Grading III	cum	1,029.00
M-024	Aggregate-Grading I 90 mm to 45 mm	cum	1,837.00
M-025	Aggregate-Grading II 63 mm to 45 mm	cum	1,936.00
M-026	Aggregate-Grading III 53 mm to 22.4 mm	cum	2,035.00
M-027	Aggregates 22.4 mm to 2.36 mm for wet mix macadam	cum	1,440.50
M-028	Aggregates 45 mm to 22.4 mm for wet mix macadam	cum	1,623.00

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-029	Aluminium sheeting (1.5 mm thick)	sqm	438.00
M-030	Aluminium Studs 100 mm x 100 mm fitted with lense reflectors	Nos.	438.00
M-031	Bamboo (1st Class) 85 mm - 100 mm dia, 2.0 m long	No.	200.00
M-032	Bamboo (1st Class) 85 mm - 100 mm dia, 2.5 m long	No.	200.00
M-033	Bamboo (1st Class) 85 mm - 100 mm dia, 3.0 m long	No.	200.00
M-034	Bamboo (1st Class) 85 mm - 100 mm dia, 4.5 m - 5.5 m long	No.	200.00
M-035	Bamboo (2nd Class) 75mm dia, 1.8 m - 2.5 m long	No.	120.00
M-036	Bamboo (2nd Class) 75mm dia, 2.1 m - 3.0 m long	No.	120.00
M-037	Barbed wire	kg	78.00
M-038	Binding Material	cum	220.00
M-039	Binding wire	kg	80.00
M-040	Bitumen (Crumb Rubber Modified)	tonne	36,420.00
M-042	Bitumen (Polymer Modified)	tonne	32,880.00
M-043	Bitumen (S-65)	tonne	39,783.00
M-044	Bitumen (S-90)	tonne	38,826.00
M-045	Bitumen Emulsion (RS-1)	tonne	28,229.00
M-046	Bitumen Emulsion (SS-1)	tonne	27,509.00
M-047	Bitumen Emulsion (MS)	tonne	28,429.00
M-048	Bituminous sealant	litre	18.36
M-049	Blasted rubble	cum	650.00
M-050	Blasting material	kg	64.00
M-051	Bond stone (400 mm x 150 mm x 150 mm)	No.	54.00
M-052	Brick 1st Class	No.	8.00
M-053	Cement	t	6,200.00
M-054	Cement Primer	litre	120.00
M-055	Compensation for earth taken from private land	cum	
M-056	Compressible Fibre Board	sqm	976.00
M-057	Copper plate	kg	585.00
M-058	Corbelling Stones (300 mm x 150 mm x 150 mm)	No.	30.00
M-059	Quarried Stone 150-200 mm size	kg	70.00

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-060	Credit for excavated rock found suitable for use	cum	168.00
M-061	Crow bars 40 mm dia (hire charges)	hour	10.00
M-062	Crushed Sand or Grit Passing 2.36 mm and retained on 180 micron	cum	698.00
M-063	Crushed Slag	cum	550.00
M-064	Crushed Stone Aggregate 26.5 mm to 75 micron	cum	1,827.00
M-065	Crushed Stone Chipping 13.2mm nominal size	cum	1,599.50
M-066	Crushed Stone Chipping 6.7 mm size 100% passing 11.2 mm and retained on 2.36 mm	cum	1,510.00
M-067	Crushed Stone Chipping 6.7 mm size 100% passing 9.5 mm and retained on 2.36 mm	cum	1,807.00
M-068	Crushed Stone chipping 9.5 mm nominal size	cum	1,510.00
M-069	Crushed Stone Coarse Aggregate Passing 53 mm and retained on 2.8 mm	cum	1,174.50
M-070	Curing compound	litre	-
M-071	Edge Stone (450 mm x 350 mm x 100 mm)	No.	80.00
M-072	Edge Stone (450 mm x 350 mm x 200 mm)	No.	80.00
M-073	Electric Detonator	each	15.00
M-074	Epoxy Paint	litre	410.00
M-075	Epoxy Primer	litre	373.00
M-076	Farmyard manure	cum	56.00
M-077	Fevicol adhesive	kg	230.00
M-078	Filter media	cum	1,013.00
M-079	Fine aggregate/Crushed sand 2.36 mm to 75 micron	cum	698.00
M-080	Galvanised angle	kg	70.00
M-081	Galvanised angle Section 100 mm x 100 mm of 12 mm thickness	kg	450.00
M-082	Gelatine 80 per cent	kg	120.00
M-083	GI Pipe 100 mm dia	m	900.00
M-084	GI Pipe 50 mm dia	m	450.00
M-085	GI wires	kg	75.00
M-086	Graded stone aggregate	cum	1,554.00

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-087	Granular material (Natural occuring, soil gravel mixture / quarry waste, kankar, laterite, dhandla	cum	698.00
M-088	Hand Broken Metal 40 mm size	cum	1,500.00
M-089	Jute netting, open weave 25 mm square opening	sqm	76.00
M-090	Jute rope 12 mm dia	m	90.00
M-091	Key Aggregates passing 22.4 mm and retained on 2.8 mm	cum	1,440.50
M-092	Lime	t	6,608.00
M-093	Lime putty	t	7,000.00
M-094	Local Wood Piles (1st Class) 150-200 mm dia ,6m long	No.	7,000.00
M-095	Local Wood Piles (1st Class) 100 mm x 75 mm	cum	32,400.00
M-096	Loose stone	cum	1,500.00
M-097	MS clamps	Nos.	19.00
M-098	MS Flat / Structural Steel	t	60,000.00
M-099	MS Sheet Tube (47 mm x 47 mm x 12 SWG Sheet)	kg	83.00
M-100	MS Sheet 1.5 mm thick	sqm	55.00
M-101	MS Sheet 2 mm thick	sqm	65.00
M-102	Nuts, Bolts and Rivets	t	80,000.00
M-103	Paint (Synthetic Enamel)	litre	250.00
M-104	Plasticizer	litre	102.00
M-105	Polythene sheet (125 micron)	sqm	12.00
M-106	Polythene Sheething	Nos.	12.00
M-107	Quarried Stone 150-200 mm size	cum	898.00
M-108	RCC Pipe NP3 (1200 mm dia)	m	8,570.00
M-109	RCC Pipe NP3 (1000 mm dia)	m	6,340.00
M-110	RCC Pipe NP4 (1200 mm dia)	m	10,370.00
M-111	RCC Pipe NP4 (1000 mm dia)	m	8,579.00
M-112	RCC Pipe NP3 (600 mm dia)	m	2,618.00
M-113	Red-oxide Primer	litre	165.00
M-114	Road marking paint	litre	90.00
M-115	Sand (Coarse)	cum	950.00

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-116	Sand (Fine)	cum	850.00
M-117	Seeds	kg	31.00
M-118	Steel Pipe 50 mm dia	m	131.00
M-119	TMT - IS 1786 (Fe-500 D) Primary Producer	t	40,763.00
M-120	MS bar - IS 1786 (Fe-500) Primary Producer	t	41,525.00
M-121	TMT - IS 1786 (Fe-500 D) Secondary Producer	t	34,492.00
M-122	Stone Boulder of size 150 mm and below	cum	1,055.00
M-123	Stone Chips 12 mm size	cum	1,510.00
M-124	Stone Chips 6.7 mm size	cum	1,807.00
M-125	Stone Chips 13.2 mm to 5.6 mm	cum	1,599.50
M-126	Stone Crushed Aggregate 11.2 mm to 0.09 mm	cum	1,510.00
M-127	Stone for Coarse Rubble Masonry 1st Sort	cum	1,135.00
M-128	Stone for Coarse Rubble Masonry 2nd Sort	cum	1,135.00
M-129	Stone for Random Rubble Masonry	cum	1,135.00
M-130	Stone for Stone Set Pavement (300 mm x 200 mm x 150 mm)	No.	170.00
M-131	Stone Screening - Type A 13.2 mm for Grading-1	cum	799.50
M-132	Stone Screening - Type A 13.2 mm for Grading-2	cum	799.50
M-133	Stone Screening - Type B 11.2 mm for Grading-2	cum	710.00
M-134	Stone Screening - Type B 11.2 mm for Grading-3	cum	710.00
M-135	Stone spall	cum	987.00
M-136	Traffic cones	No.	1,229.00
M-137	Water	kl	40.00
M-138	Well graded Granular Base Material - Grading A 2.36 mm below	cum	698.00
M-139	Well graded Granular Base Material - Grading A 26.5 mm to 4.75 mm	cum	1,089.00
M-140	Well graded Granular Base Material - Grading A 53 mm to 26.5 mm	cum	1,124.00
M-141	Well graded Granular Base Material - Grading B 2.36 mm below	cum	698.00
M-142	Well graded Granular Base Material - Grading B 26.5 mm to 4.75 mm	cum	1,089.00
M-143	Well graded Granular Base Material - Grading C 2.36 mm below	cum	698.00
M-144	Well graded Granular Base Material - Grading C 9.5 mm to 4.75 mm	cum	1,084.00
M-145	Well Graded Material for Sub-Base - Grading I 2.36 mm below	cum	698.00

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-146	Well Graded Material for Sub-Base - Grading I 53 mm to 9.5 mm	cum	1,119.00
M-147	Well Graded Material for Sub-Base - Grading I 9.5 mm to 2.36 mm	cum	1,041.50
M-148	Well Graded Material for Sub-Base - Grading II 2.36 mm below	cum	698.00
M-149	Well Graded Material for Sub-Base - Grading II 26.5 mm to 9.5 mm	cum	1,101.00
M-150	Well Graded Material for Sub-Base - Grading II 9.5 mm to 2.36 mm	cum	1,041.50
M-151	Well Graded Material for Sub-Base - Grading III 2.36 mm below	cum	698.00
M-152	Well Graded Material for Sub-Base - Grading III 4.75 mm to 2.36 mm	cum	1,029.00
M-153	Well Graded Material for Sub-Base - Grading III 9.5 mm to 4.75 mm	cum	1,041.50
M-154	Wooden sleepers (250 mm x 250 mm x 125 mm) (hire charges)	No.	45.00

BASIC RATES
(B) USAGE RATES OF PLANT & MACHINERY

Sl. No.	Description of		Output of Machine			Hire charge per hour in Rs (Excluding fuel)	Usage rate per hour in Rs (Including Fuel)
	Machine	Activity	Unit	Output	Unit		Rate
PM-001	Air Compressor 210 cfm	Supplying compressed air	cfm	210.00	per hour		435.00
PM-002	Batch mix HMP 40-60 TPH	BM, DBM, SDBC, PM	t/h	50.00	per hour		12,379.00
PM-003	Batch type HMP 30/40 TPH	BM, DBM, SDBC, PM	t/h	35.00	per hour		6,584.00
	Batching and mixing plant(a)30cum capacity	concrete mixing	cum/hour	20.00	per hour		1,957.00
	Batching and mixing plant(b)15-20cum capacitycapacity	concrete mixing	cum/hour	13.00	per hour		1,590.00
	Bitumen pressure distributor	Applying bitumen tack coat	sqm/hour	1750.00	per hour		954.00
PM-004	Bitumen boiler oil fired						
	200 litre	Heating of bitumen	litre / h	400.00	per hour	164.00	212.00
	1000 litre		litre / h	2000.00	per hour		2,120.00
PM-005	Bitumen emulsion pressure distributor	Applying bitumen tack coat	sqm/h	1750.00	per hour		954.00
	Concrete pump of 45&30 cum capacity	Pumping of concrete	cum/hour	1.50	per hour		234.00
	Concrete bucket	For pouring concrete	/cum	1.00	per hour		15.00
PM-006	Concrete mixer 0.28/0.4 cum	Mixing of ingradients	cum/h	2.50	per hour	162.00	188.00
	Crane (a) 80 t0n	Lifting purpose			per hour		1,136.00
	Crane(b)35 ton	Lifting purpose			per hour		759.00
	Crane(c)3 ton	Lifting purpose			per hour		318.00
PM-007	Crane upto 8T	Lifting of materials			per hour		685.00
PM-008	Dozer D 50	Dozing cutting	cum/h	200.00	per hour	2096.00	2,260.00
			cum/h	100.00			
	D-80-A-12	Spreading/cutting/clearing	cum/h	300/150/250			3,194.00
	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.		per hour				1,859.00
PM-009	Electric generator set, 125 KVA	Electricity generation	KVA	100.00	per hour	437.00	2,073.00
PM-010	Emulsion Sprayer with Tractor	Spraying of Emulsion			per hour		717.00
PM-011	Front end-loader 1 cum bucket	Loading Aggregates	cum/h	45.00	per hour	511.00	1,341.00
	capacity @ 45 cum/hour	Loading Soil	cum/h	100.00			
	Hot mix plant 120 TPH	DBM/BM/SDC/Premix	cum/h	40.00	per hour		22,823.00
	Hot mix plant 100TPH	DBM/BM/SDC/Premix	cum/h	30.00			16,575.00
	Hot mix plant 60 t0 90TPH	DBM/BM/SDC/Premix	cum/h	25.00	per hour		14,115.00
PM-012	Hydraulic broom with tractor	Surface cleaning	sqm/h	1250.00			337.00
	Hydraulic Excavator 1 bucket	Excavation	hour	60/60/60	per hour	1006.00	1,500.00
PM-013	Hydraulic Excavator 0.9 cum	Excavation	cum/h	100.00			1,635.00

BASIC RATES
(B) USAGE RATES OF PLANT & MACHINERY

Sl. No.	Description of		Output of Machine			Hire charge per hour in Rs (Excluding fuel)	Usage rate per hour in Rs (Including Fuel)
	Machine	Activity	Unit	Output	Unit		Rate
PM-014	Hydraulic self propelled chip spreader	Surface Dressing	sqm/h	1500.00	per hour		2,380.00
PM-015	Joint Cutting Machine with 2-3 blades	Cutting of Joints	h		per hour		150.00
	Mastic cooker	Mastic wearing coat	Ton	1.00	per hour		56.00
PM-016	Mixall 6-10 t capacity	Mixing of bituminous materials	t/h	8.00	per hour	445.00	1,686.00
PM-017	Motor Grader	Scarifier & levelling	cum/h	200.00	per hour	2276.00	
3,075.00				50.00			
PM-018	Needle vibrator	Vibrating cement concrete mix	cum/h	3.50	per hour		101.00
	Paver finisher Hydrostatic with sensor	Paving of	cum/h	40.00	per hour		1,129.00
	control 100 TPH	DBM/BM/SDC/Premix					
	Pneumatic sinking plant	Pneumatic sinking of wells	cum/h	1.5 to 2.00	per hour		3,453.00
	Piling rig with bantonite pump	.75 dia to 1.2m	Rm/hour	2 to 3	per hour		4,665.00
		attatchment dia boring					
	Prestressing Jack with access.	Stressing of steel wire/			per hour		113.00
		strands					
PM-019	Paver finisher	Laying/spreading	t/h	75.00	per hour		883.00
PM-020	Plate compactor	Compaction	cum/h		per hour		218.00
PM-021	Plate vibrator	Compaction	cum/h		per hour		218.00
	Rotavator	Scarifying	cum/h	25.00	per hour		22.00
	Ripper	Scarifying	cum/h	60.00	per hour		31.00
	Road marking machine	Road marking	Sqm/hr	100.00	per hour		192.00
PM-022	Screed vibrator	Compaction	cum/h		per hour		
PM-023	Smooth wheeled 80-100 kN tandem	Compaction of Sub-base/	cum/h	30.00	per hour	1,039.00	
	roller	Asphalt					
PM-024	Stone crusher (Integrated) of 200 TPH	Crushing of Spalls	t/h	200.00	per hour		14,389.00
PM-025	Three wheel 80-100 kN Static Roller	Compaction/ Rolling			per hour		652.00
		Earth:- Embankment or	cum/h	80/70			652.00
		sub-grade					
		Sub-base G-I	cum/h	10.00			652.00
		Sub-base G-II/G-III	cum/h	8.00			652.00
		WMM	cum/h	16.00			652.00
		BUSG	cum/h	10.00			652.00
		BM 50/75 mm	cum/h	12.00			652.00
		Premix 20 mm	sqm/h	250.00			652.00
		Seal Coat	sqm/h	500.00			652.00

BASIC RATES
(B) USAGE RATES OF PLANT & MACHINERY

Sl. No.	Description of		Output of Machine			Hire charge per hour in Rs (Excluding fuel)	Usage rate per hour in Rs (Including Fuel)
	Machine	Activity	Unit	Output	Unit		Rate
		Surface Dressing 1st Coat	sqm/h	400.00			652.00
		Surface Dressing 2ndCoat	sqm/h	500.00			652.00
PM-026	Tipper 5.5 cum/10 t	Carriage	cum/trip	5.50	per hour		850.00
PM-027	Tractor with Disc Harrows	Pulverisation of soil	cum/h	80.00	per hour		
PM-028	Tractor with ripper @ 60 cum per hour	Ripping Pavements, uprooting trees	cum/h	60.00	per hour		440.00
PM-029	Tractor with trolley	Transportation of materials	t/trip	3 to 5	per hour		409.00
PM-030	Tractor with Rotavator	Scarifier	cum/h	25.00	per hour		431.00
	Tractor with Grader	Grading	cum/h	25.00	per hour		431.00
	Transit mixure 4.0/4.5cum	Transportation of concrete mix	cum/h	4.50	per hour		828.00
	Transit mixure 4.0/4.5cum	Transportation of concrete mix	cum/h	4.50	Ton/km		40.00
PM-031	Truck 10 t capacity	Carriage	cum/trip	5.50	per hour		825.00
PM-032	Vibratory roller 80-100 kN	Compaction of soil WMM	cum/h	100.00	per hour		1,687.00
		Compaction of BM	cum/h	60.00			
PM-033	Water tanker 6 kl capacity (Truck Mounted)	Carriage of water	litre / h	12000.00	per hour		440.00
PM-034	Wet mix plant (Pug Mill)	Wet Mix	cum/h	25.00	per hour		1,149.00