GOVERNMENT OF ASSAM

PUBLIC WORKS ROADS DEPARTMENT

SCHEDULE OF RATES FOR
RURAL ROADS
FOR ALL DIVISIONS UNDER PWRD, ASSAM
FOR THE YEAR 2020-21

PUBLISHED BY:
COMMISSIONER & SPECIAL SECRETARY
PUBLIC WORKS ROADS DEPARTMENT, ASSAM
DISPUR, GUWAHATI-6

CERTIFICATE

Certified that the Schedule of Rates for Rural Roads for all divisions under Public Works Roads Department (PWRD), Assam for the year 2020-2021 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.

Chief Engineer, Roads
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Chandmari, Guwahati - 781003

Chief Engineer, Border Roads
Public Works Roads Deptt, Assam
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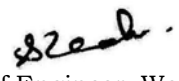

Addl. Chief Engineer, Western Zone
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Chandmari, Guwahati - 781003

Addl. Chief Engineer, Mechanical
Public Works Roads Deptt, Assam
Chandmari, Guwahati - 781003

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 2020-21 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.

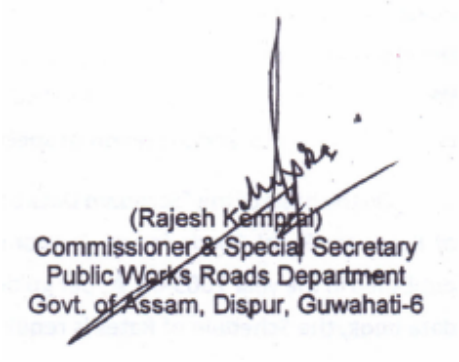
As per current revision of the specifications of Data Book in 2014 some new items has also been incorporated in this edition alongwith Long-span Bridges as per MORTH Guidelines.

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. 31-12-2020

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 the 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 form would prove to be very useful to all practicing Rural Roads Engineers.



PREFACE

The Schedule of Rates for Rural Roads for all Divisions under PWRD, Assam was last revised in the year 2017-18. Since then the cost of all materials used in Road & Bridge construction works have been varying considerably making the schedule of rate practically unworkable. As such, the revision of the schedule of rates for 2020-21 has become necessary to make the S.O.R. workable at the present stage.

Accordingly, the revision of S.O.R. was carried out considering the present prices of construction materials during the year 2020. The wages of skilled & unskilled labourers are based on the rates fixed by Labour Commissioner, Govt. of Assam.

The detailed analysis of rate for all items covered by this schedule of rates has been carried out on the basis of standard Data Book published by Ministry of Rural Development (MoRD).

The items in this S.O.R. will cover both original & repair/rehabilitation works involved in Roads & Bridge works for Rural Roads and are likely to cover almost all aspects of work, which may arise. The specification in this S.O.R. is prepared in consultation with NRRDA/ MoRD specification (4th Revision).

A number of new items have been incorporated in this S.O.R. (19-20) taking into consideration the present demand and requirements of modern construction materials that have been introduced in the market.

Additional Chapters have been incorporated in this SOR that includes New Innovative Technology in addition to major Road works and Bridge Works as per MORT&H specifications.

In RCC works the reinforcement is brought in 2 categories considering differential cost.

1) From Primary Sources: TATA/SAIL/Esser Steel/ Jindal steel/Shyam steel make

2) From Secondary Sources: Other ISI approved TMT reinforcement steel make

However, other ISI approved TMT reinforcement steel not provided for Major Bridge works (in Chapter 17 as per MORT&H Specifications).

Every endeavor has been made to make this S.O.R. comprehensive and expressive in all respect. If however, there is any error or omission, the same may kindly be brought to the notice of the Chief Engineer, PWD, (Roads), Assam.

The S.O.R. (2020-21) will be effective for all Roads Divisions under Assam PWRD from the date of its publication.

In this context, the valuable contribution and support extended by the following officers deserve special thanks. I convey my thanks to:

1. Shi Chandan Sarma, Superintending Engineer, PWD, NEC (Planning) Cell, O/o the C.E, PWD (Roads), Assam, Chandmari, Guwahati-3

2. Shi Santosh Tamuli, Executive Engineer, PWD, IBRC, O/o the C.E, PWD (Border Roads), Assam, Chandmari, Guwahati-3

3. Shi Atul Baishya, Executive Engineer, PWD, PMGSY, O/o the C.E, PWD (Border Roads), Assam, Chandmari, Guwahati-3

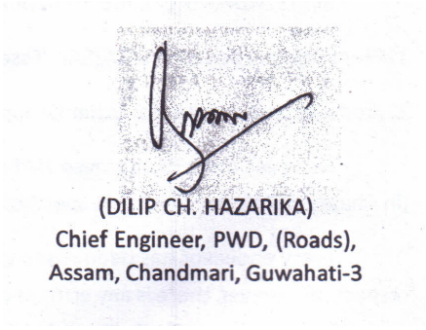
4. Sri Prahlad Ch. Kakati, Executive Engineer, West Guwahati Terr. Roads Division, PWRD, Assam, Chandmari, Guwahati-3

5. Sri Amarjyoti Das, Assistant Executive Engineer, PWRD, NEC Bridge Design, O/o the C.E, PWD (Border Roads), Assam, Chandmari, Guwahati-3

6. Sri Nilotpal Kalita, Assistant Executive Engineer, PWRD, O/o the C.E, PWD (Roads), Assam, Chandmari, Guwahati-3

I am thankful to all the Officers/ Staff of the SOR Preparation Committee, who have actively associated themselves in preparing the S.O.R. (2020-21) successfully.

The draft copy of S.O.R. (2020-21) has been approved by the Commissioner and Special Secretary to the Govt. of Assam, PWRD, Dispur, Guwahati-6 and communicated to this office vide DA5R.101/2020/187 dtd. 31-12-2020



(DILIP CH. HAZARIKA)
Chief Engineer, PWD, (Roads),
Assam, Chandmari, Guwahati-3

SCHEDULE OF RATES
PREPARATION COMMITTEE

Vide Office Order No. CE/SRC/1/2017/59 dated 29-04-2019

(A) S.O.R. Approval Committee:

1. Chief Engineer, PWD (Roads)
2. Chief Engineer, PWD (Border Roads & NEC Works)
3. Chief Engineer, PWD (EAP)
4. Dy. Secretary (Works) to the Govt. of Assam, PWRD
5. Addl. Chief Engineer, PWD (Planning)
6. Addl. Chief Engineer, PWD (W/Z)
7. Addl. Chief Engineer, PWD (Mechanical)
8. Superintending Engineer, PWD (Planning)
9. Superintending Engineer, PWD (Traffic Cell)
10. Addl. Director, Design, Bridge Design Branch
11. Superintending Engineer, PWD (PMGSY)
12. Director, Assam Road Research & Training Institute (ARR&TI)
13. Executive Engineer, PWD (PMGSY)

(B) Working Members:

1.	**Overall in-charge:**	**Sri Chandan Sarma, Superintending Engineer, PWD**
2.	Asstt. in-charge:	Sri Santosh Tamuly, Executive Engineer, PWD
3.	Convenor:	Sri Atul Baishya, Executive Engineer, PWD
4.	Asstt. Convenor :	Sri Sushil Das, Asstt. Executive Engineer, PWD
		Mrs. Bandita Das, Asstt. Executive Engineer, PWD
		Sri Paresh Ch. Haloi, Asstt. Executive Engineer, PWD

(C) Collection of Basic rates of materials, labour etc.:

1.	**In-charge:**	**Sri Nilotpal kalita, Asstt. Executive Engineer, PWD**
2.	Members:	Sri Dipak Sarma, Asstt. Engineer, PWD
		Sri Gobinda Dutta, Asstt. Engineer, PWD
		Sri Panchanan Baruah, Asstt. Engineer, PWD
		Sri Prabin Talukdar, Junior Engineer, PWD
		Sri Amol Deka, Junior Engineer, PWD
		Sri Diganta Hazarika, Junior Engineer, PWD

(D) Preparation of Schedule of Rates for the year 2020-21:

1.	**In-charge:**	**Sri Amarjyoti Das, Asstt. Executive Engineer, PWD**
2.	Members:	Sri Banajit Choudhury, Asstt. Executive Engineer, PWD
		Sri Ranjit Dutta, Asstt. Engineer, PWD
		Ms. Bandana Saikia Kharghoria, Asstt. Engineer, PWD
		Ms. Seema Pegu, Asstt. Engineer, PWD

(E) Printing, Scrutiny & Query reply:

1. In-charge:	**Sri Santosh Tamuly, Executive Engineer, PWD**
2. Members:	Sri Anup Kr. Das, Executive Engineer, PWD
	Sri Sushil Das, Asstt. Executive Engineer, PWD
	Mrs. Bandita Das, Asstt. Executive Engineer, PWD
	Sri Paresh Ch. Haloi, Asstt. Executive Engineer, PWD
	Sri Jyandeep Choudhury, Asstt. Executive Engineer, PWD
	Sri Pranjal Bhattacharjee, Asstt. Executive Engineer, PWD
	Sri Papul Saikia, Asstt. Executive Engineer, PWD
	Sri Himadri Sekhar Das, Asstt. Engineer, PWD

(F) Observations of NRRDA, Comparison of SORs, Resolution, etc:

1. In-charge:	**Sri Parikhit Baruah, Superintending Engineer, PWD, PMGSY Branch**
2. Members:	Sri Atul Baishya, Executive Engineer, PWD
	Sri Pranjal Bhattacharjee, Asstt. Executive Engineer, PWD
	Sri Arup Kalita, Asstt. Engineer, PWD
	Sri Himadri Sekhar Das, Asstt. Engineer, PWD

CONTENT

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:**

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

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

   5.3. 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 the following elements.

      i. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
      ii. Site office infrastructure.
      iii. Expenditure on
         (a) Corporate office of the Contractor
         (b) Site supervision by the Contractor
         (c) Preparation of "as built" drawings

iv. Mobilization/demobilization of resources.
v. Labour camps with minimum amenities, required as per labour laws.
vi. Light vehicles for site supervision including administrative and managerial requirements.
vii. Setting up of laboratories for quality control, field and laboratory testing for control of quality of various items of work and documentation of test results as per requirements of the MORD Specifications.
viii. Minor T&P including needle vibrators required for concrete work.
ix. 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).
x. Taking of trial pits and bore holes, where required as per the MORD Specifications.
xi. Watch and ward.
xii. Arrangement for traffic and traffic management during construction.
xiii. Expenditure on safeguarding environment during construction.
xiv. Sundries.
xv. Financing expenditure of the Contractor.
xvi. Work insurance/compensation.

5. **GST, Labour Welfare Cess, Swatch Bharat etc.:**

5.1. Overall No Taxes has been considered in the analysis towards 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 wherever required if necessary.

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 TMT from Primary Producers and other BIS Approved bars conforming to IS: 1786 have been considered. However, only TMT bars from Primary Producers are considered for Major Bridge Structures (as per MORT&H Specification).

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 where ever required only after being duly certified by Superintending Engineer of respective Circle 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 Bituminous 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 relevant MORD specifications.

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 as per 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 charges of Road rollers have been multiplied with a factor of 0.65 to account for the idle period where ever 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 tanker 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 should 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.

(i) A basic lead of 5 Km has been considered for the stone aggregates in order to work out the initial finished rates of WBM and Granular Sub-base/base items.

(ii) In case of Hot Mix plants the basic lead of the stone aggregates and an initial lead of 10 Km. between the plant and site of work have been considered.

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 Private/ Govt. land Forest Royalty 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, municipal taxes, Forest royalty and other local taxes, etc.

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 Section 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 Specifications 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 of grade M-25, M-30 and M40 for concrete pavement

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

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

12.4. Ten per cent extra cement may be provided for concreting under water, where required.

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:

12.9. Major RCC/ PSC Bridges are to be provided as per MORT&H Specifications; for which separate Chapter has been provided.

13. **Measurement and Rates:**

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

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

ABBREVIATIONS

Abbr.	Detail
AC	Asphaltic Concrete
BC	Bituminous Concrete
BM	Bituminous Macadam
BUSG	Built-up Spray Grout
cfm	Cubic feet per minute
CI	Cast Iron
cm	Centimetre
cum	Cubic metre
DBM / DGBM	Dense Grade Bituminous Macadam
Dia	Diameter
e.g.	For example
FE Loader	Front End Loader
GBFS	Granulated Blast Furnace Slag
GI	Galvanised Iron
GL	Ground Level
h	Hours
HMP	Hot Mix Plant
HP	Hours Power
i.e.	That is
IRC	Indian Roads Congress
IS	Indian Standards
kg	Kilogram
kl	Kilolitre
km	Kilometre
kN	Kilo Newton
lit	Litre
m / RM	Metre
Max	Maximum
Min	Minimum
mm	Millimetre
MORD	Ministry of Road Development
MORTH	Ministry of Road Transport & Highways
Nos.	Numbers
NRRDA	National Rural Roads Development Agency

Abbr.	Detail
OMC	Optimum Moisture Content
PCC	Plain Cement Concrete
PQC	Pavement Quality Concrete
PSC	Pre-Stressed Concrete
q / qntl.	Quintal
RCC	Reinforced Cement Concrete
RR	Road Roller
Rs.	Rupees
SDBC	Semi-Dense Bituminous Concrete
sqm	Square metre
SWL	Standing Water Level
t	Tonne
T&P	Tools & Plants
t.km	Tonne Kilometre
WBM	Water Bound Macadam
WMM	Wet Mix Macadam

BASIC RATES

BASIC RATES
(A) Labour

Sl. No.	Description of Labour	Unit	Rate (Rs.)
L-01	Bhisti	day	272.02
L-02	Bitumen Sprayer	day	272.02
L-03	Blacksmith	day	510.03
L-04	Blaster	day	396.70
L-05	Carpenter 1st Class	day	510.03
L-06	Chips spreader	day	272.02
L-07	Chiseller	day	317.35
L-08	Dresser (Skilled)	day	396.70
L-09	Driller	day	396.70
L-10	Electrician	day	510.03
L-11	Fitter	day	510.03
L-12	Mason (1st class)	day	510.03
L-13	Mason (2nd Class)	day	317.35
L-14	Mate	day	396.70
L-15	Mazdoor (Unskilled)	day	272.02
L-16	Mazdoor (Semi skilled)	day	317.35
L-17	Mazdoor (Skilled)	day	396.70
L-18	Painter (Ist class)	day	510.03
L-19	Plumber	day	510.03
L-20	Surveyor	day	510.03
L-21	White Washer	day	317.35

BASIC RATES
(B) USAGE RATES OF PLANT & MACHINERY

Sr. 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		10,091.00
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		1,670.00
	Batching and mixing plant(b)15-20cum capacitycapacity	concrete mixing	cum/hour	13.00	per hour		1,260.00
	Bitumen pressure distributor	Applying bitumen tack coat	sqm/hour	1750.00	per hour		1,274.00
PM-004	Bitumen boiler oil fired	Heating of bitumen					
	200 litre		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	2,103.00
			cum/h	100.00			
	D-80-A-12	Spreading/cutting/clearing	cum/h	300/150/250			2,797.00
	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	1,625.00
PM-010	Emulsion Sprayer with Tractor	Spraying of Emulsion			per hour		717.00
PM-011	Front end-loader 1 cum bucket capacity @ 45 cum/hour	Loading Aggregates	cum/h	45.00	per hour	511.00	1,341.00
		Loading Soil	cum/h	100.00			
	Hot mix plant 120 TPH	DBM/BM/SDC/Premix	cum/h	40.00	per hour		16,677.00
	Hot mix plant 100TPH	DBM/BM/SDC/Premix	cum/h	30.00			14,777.00
	Hot mix plant 60 t0 90TPH	DBM/BM/SDC/Premix	cum/h	25.00	per hour		12,330.00
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

Sr. 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		879.00
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	2,498.00
				50.00			
PM-018	Needle vibrator	Vibrating cement concrete mix	cum/h	3.50	per hour		101.00
	Paver finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/BM/SDC/Premix	cum/h	40.00	per hour		1,129.00
	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 attatchment dia boring	Rm/hour	2 to 3	per hour		4,665.00
	Prestressing Jack with access.	Stressing of steel wire/strands			per hour		113.00
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 roller	Compaction of Sub-base/ Asphalt	cum/h	30.00	per hour		1,039.00
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					652.00
		Earth:- Embankment or sub-grade	cum/h	80/70			652.00
		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	per hour		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
		Surface Dressing 1st Coat	sqm/h	400.00			652.00
		Surface Dressing 2ndCoat	sqm/h	500.00			652.00

Sr. 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-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		1,505.00
		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
	Tractor with trolley (with cutting, Clearing attachments)	Cutting, Clearing and Transportation of materials	t/trip	3 to 5	per hour		431.00

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
M-029	Aluminium sheeting (1.5 mm thick)	sqm	438.00

Sl. No.	Description	Unit	Rate at Plant (Rs.)
M-029A	Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size including lettering and signs as applicable background with epoxy paint	sqm	8,750.00
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	30,850.00
M-042	Bitumen (Polymer Modified)	tonne	32,880.00
M-043	Bitumen (S-65)	tonne	33,050.00
M-044	Bitumen (S-90)	tonne	32,250.00
M-045	Bitumen Emulsion (RS-1)	tonne	33,474.00
M-046	Bitumen Emulsion (SS-1)	tonne	35,169.00
M-047	Bitumen Emulsion (MS)	tonne	36,016.00
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	6,360.00
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	214.00
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	21.00
M-074	Epoxy Paint	litre	410.00
M-075	Epoxy Primer	litre	373.00
M-075A	Elastomeric bearing assembly consisting of internal layers of elastomer bonded to internal reinforcing steel laminates by the process of vulcanisation, complete with all components	cu.cm.	41,490.00
M-075B	Elastomeric slab seal expansion joint assembly	m	19,000.00
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
	Indigo	kg	100.00
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	45,000.00
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-100A	MS Sheet 1.5 mm thick duly painted with stove enamelled paint including lettering, signs, border, message with reflective tape of engineering grade	sqm	6,050.00
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-106A	Preformed continuous chloroprene elastomer/ closed cell foam sealing element with high tear strength	m	8,150.00
M-106B	Premoulded joint filler 7.5 m long, 20 mm thick and 300 mm deep	sqm	742.00
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

Sl. No.	Description	Unit	Rate at Plant (Rs.)
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
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	41,500.00
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-122A	Stone boulder (25 kg minimum for pitching/ protection work)	cum	868.00
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

Sl. No.	Description	Unit	Rate at Plant (Rs.)
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
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
	Bamboo Bholuka or Barua 55mm to 100mm dia and 6m long	each	90.00
	Bamboo Jati or Bethua 50mm to mm dia and 6m long	each	75.00
	Wood local first class piles 25cm to 30cm	metre	4,200.00
	Wood local first class planks 25cm to 38cm thick	cum	26,500.00
	Wood local first class small section	cum	18,700.00
	Wood local first class scantling up to 15cmx15cm	cum	21,200.00
	Wood local first class heavy section above 15cmx15cm	cum	24,100.00
	Wood sal piles 25cm to 30cm dia	metre	5,000.00
	Wood sal planks 25cm to 38cm dia thick	cum	32,000.00
	Wood sal scantling heavy section above 15cm to 15cm	cum	27,000.00
	Wood sal scantling upto15x15cm	cum	120.00

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 New Item for Haulage/ Carriage of materials by boats has been included in this Chapter. However, the item is only applicable for Site completely inaccessible by Road and the same shall be certified by concerned Executive Engineer.

Summary of Rate Analysis

Item No.	Description	Unit	Rate (Rs.)
Chapter 1 - LOADING, UNLOADING, CARRIAGE CRUSHING OF MATERIALS AND SETTING OUT			
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	113.80
(ii)	Loading of Earth, Sand, Moorum, Manure, Flyash by manual means including a lead upto 30 m	cum	56.90
(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	56.90
(iv)	Unloading of Earth,Sand, Moorum,Manure,Fly ash, by manual means including lead upto 30M	cum	35.40
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.	193.60
(ii)	Unloading and Stacking of Bricks by manual means including a lead upto 30 m	1000 Nos.	193.60
1.4	Loading and Unloading of Cement by Manual Means		
(i)	Loading of Cement by manual means including a lead upto 30 m	t	707.00
(ii)	Unloading of Cement by manual means including a lead upto 30 m	t	141.40
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	151.00
(ii)	Unloading of Structural Steel, Steel Bars by manual means including a lead upto 30 m	t	151.00
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	167.70
(ii)	Unloading of Bitumen Drums by Manual Means including a lead upto 30 m	t	155.00
1.7	Loading and Unloading of Timber by Manual Means		

Item No.	Description	Unit	Rate (Rs.)
(i)	Loading of Timber by manual means including a lead upto 30 m	t	250.40
(ii)	Unloading of Timber by manual means including a lead upto 30 m	t	250.40
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	370.90
(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	370.90
1.9	Loading and Unloading of Hume Pipes		
A	Loading of RCC Hume pipes by mechanical means including a lead upto 30 m		
(i)	1000 / 1200 mm dia Hume pipe	per pipe	80.30
(ii)	750 mm dia Hume pipe	per pipe	48.20
(iii)	600/450 mm dia Hume pipe	per pipe	34.40
B	Unloading of RCC Hume pipe by manual means including a lead upto 30 m		
(i)	1000/1200 mm dia RCC Hume pipes	per pipe	460.80
(ii)	750 mm dia Hume pipe	per pipe	384.00
(iii)	600/450 mm dia Hume pipe	per pipe	288.00
C	Unloading of RCC Hume pipes by mechanical means including a lead upto 30 m		
(i)	1000/1200 mm dia Hume pipe	per pipe	55.70
(ii)	750 mm dia Hume pipe	per pipe	33.40
(iii)	600/450 mm dia Hume pipe	per pipe	23.90
1.10	Haulage excluding Loading & Unloading		
A	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		
(i)	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	1,500.00

Item No.	Description	Unit	Rate (Rs.)
(ii)	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	1,597.00
(iii)	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	1,694.00
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	1,249.30
1.13	Crushing of Stone Aggregates 100 per cent passing through 22.4 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 22.4 mm sieve as per Table 500.6 of Technical Specifications including the cost of stone.	cum	1,447.70
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	1,706.00
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	1,706.00
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	7212.20
	(vi) Typical reference pillar as per Drawing 200.2	each	3599.60

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 2 - SITE CLEARANCE			
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.		
(i)	By Manual Means	hectare	12,955.00
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	46,898.30
(b)	In area of thorny jungle	hectare	67,527.10
(ii)	By Mechanical Means		
(a)	In area of non-thorny jungle	hectare	25,414.40
(b)	In area of thorny jungle	hectare	31,023.90
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	226.50
ii	Girth above 600 mm to 900 mm	each	388.10
iii	Girth above 900 mm to 1800 mm	each	776.60
iv	Girth above 1800 mm to 2700 mm	each	1,488.70
v	Girth above 2700 mm to 4500 mm	each	3,051.10
vi	Girth above 4500 mm	each	9,017.10
B	Lead upto 1000 m		
i	Girth above 300 mm to 600 mm	each	240.30
ii	Girth above 600 mm to 900 mm	each	429.50
iii	Girth above 900 mm to 1800 mm	each	831.80
iv	Girth above 1800 mm to 2700 mm	each	1,571.60
v	Girth above 2700 mm to 4500 mm	each	3,143.10
vi	Girth above 4500 mm	each	9,247.20
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.		

Item No.	Description	Unit	Rate (Rs.)
A	Lead upto 100 m		
i	Girth above 300 mm to 600 mm	each	137.80
ii	Girth above 600 mm to 900 mm	each	217.30
iii	Girth above 900 mm to 1800 mm	each	462.90
iv	Girth above 1800 mm to 2700 mm	each	913.70
v	Girth above 2700 mm to 4500 mm	each	1,839.90
vi	Girth above 4500 mm	each	5,203.20
B	Lead upto 1000 m		
i	Girth above 300 mm to 600 mm	each	141.10
ii	Girth above 600 mm to 900 mm	each	228.80
iii	Girth above 900 mm to 1800 mm	each	476.70
iv	Girth above 1800 mm to 2700 mm	each	932.10
v	Girth above 2700 mm to 4500 mm	each	1,862.90
vi	Girth above 4500 mm	each	5,318.20
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 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	309.50
(b)	Cement Concrete	cum	397.50
(c)	Reinforced Cement Concrete	cum	1,124.60
II	By Mechanical Means		
(a)	Cement Concrete	cum	382.60
(b)	Reinforced Cement Concrete	cum	627.00
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	180.00
(b)	Cement mortar	cum	241.10
(c)	Mud Morter	cum	162.60
(d)	Dry Brick Pitching or Brick Soling	cum	149.70
2.7	Dismantling Stone Masonry as per Technical Specification Clause 202:		

Item No.	Description	Unit	Rate (Rs.)
	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	236.40
(b)	Rubble Stone Masonry in Cement Mortar	cum	183.50
(c)	Rubble Stone Masonry in Mud Mortar	cum	180.00
(d)	Dry Rubble Masonry	cum	167.00
(e)	Dismantling Stone Pitching / Dry Stone Spalls	cum	167.50
(f)	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials	cum	210.50
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	565.80
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	1,514.60
(b)	Excluding dismembering	t	1,045.40
(c)	Extra over Items (a) and (b) above for cutting rivets	t	11.90
2.10	**Scraping of bricks dismantled from brick work including stacking as per Technical Specification Clause 202.**	1000 Nos.	1,133.60
2.11	**Scraping of Stone from Dismantled Stone Masonry as per Technical Specification Clause 202.**		
(a)	In Cement or Lime Mortar	cum	455.20
2.12	**Scraping Plaster in Lime or Cement Mortar from Brick / Stone Masonry as per Technical Specification Clause 202.**	sqm	14.40
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	168.10
(b)	Above 600 mm to 900 mm dia Hume pipe	m	227.60
(c)	Above 900 mm dia Hume pipe	m	389.50
	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		
(a)	Bituminous Courses	cum	571.90
(b)	Granular Courses	cum	414.50
II	By Mechanical Means		
(a)	Bituminous Courses	cum	234.60

Item No.	Description	Unit	Rate (Rs.)
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	1,045.20
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	62.40
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	11.80
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	18.20
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	each	311.90
(b)	Ordinary km Stones	each	196.40
(c)	200 m Stones	each	38.50
2.20	Dismantling of Fencing		
	Dismantling of barbed wire fencing / wire mesh fencing including posts, foundation concrete, backfilling of pit by manual means 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.	running m	49.50
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	119.00
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	196.90
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	165.80

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 3-EARTHWORK, EROSION CONTROL AND DRAINAGE			
3.1	Scarifying Existing Granular Surface to a Depth of 50 mm		
	Scarifying existing granular surface to a depth of 50mm and disposal of scarified material with a lift upto 3.0m and lead upto 1000m as per Technical specification Clause 301.4		
(i)	Manual means	sqm	19.90
(ii)	Mechanical means	sqm	7.20
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 3.0m 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	150.30
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	228.50
(ii)	Govt. Land	cum	228.50
3.5	Excavation in Ordinary Soil		
(i)	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 method should be adopted where machines can not be deployed due to site condition)	cum	121.50
(ii)	Excavation in Soil with Dozer with lead upto 100 m		
	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	50.90
(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	60.00
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	65.70
3.7	Removal of Unsuitable Soil with Disposal upto 1000 m		

Item No.	Description	Unit	Rate (Rs.)
	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	60.00
	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	188.90
(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	56.30
(iii)	Excavation in Ordinary Rock using Hydraulic Excavator and Tippers with disposal upto 1000 m		
	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	88.50
3.9	Excavation in Hard Rock		
(i)	Excavation in Hard Rock (requiring blasting) with disposal upto 1000 m		
	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	231.00
(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	984.00
B	Mechanical Means	cum	458.90
(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	330.90
3.10	Stripping, Storing and Relaying Top Soil from Right-of-Way (R.O.W)		
	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	cum	185.60

Item No.	Description	Unit	Rate (Rs.)
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	117.50
3.12	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, fetching of sods and watering as per Technical Specification Clause 309.	sqm	20.70
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	96.70
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	300.60
(ii)	Govt. land	cum	300.60
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	20.30
(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	32.00
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	1.80
3.17	Presplitting Rock Excavation Slopes		
	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	158.50
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	207.10

Item No.	Description	Unit	Rate (Rs.)
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	64.80
(B)	Mechanical Means	m	26.50
(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	97.20
(B)	Mechanical Means	m	34.60
(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 relevant 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**		
I	Providing chute drains across embankment slopes in approches of bridges and on horizontal curves as per drawings.		
(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 (Rate as per item No. 11.1 of Chapter 11).	cum	113.00
(b)	Providing and laying plain cement concrete M15 grade (Rate as per 12.5 of Chapter 12).	cum	5,516.99
(c)	Brick masonry in cement morter 1:5. (Rate as per item no 12.1 (iii) of Chapter 12).	cum	7,026.21
(d)	Plastering with cement morter 1:4. (Rate as per item no 12.3 of Chapter 12)	cum	1,295.74
(e)	Providing P.C.C. M 20 coping on the top of chute walls. (Rate as per item no 12.13 of Chapter 12)	cum	404.84

Chapter – 4

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

Preamble:

1 For construction of sub-base, one alternative 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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 4 - GRANULAR SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS			
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	1,546.20
(ii)	For Grading II Material	cum	1,467.50
(iii)	For Grading III Material	cum	1,375.00
4.2	**Gravel/Soil-Aggregate Base (Table 400.2)**		
	(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 three wheel 80-100 kN static roller to achieve the desired density, complete as per Technical Specifications Clause 402	cum	1,609.80
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 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	1,564.00
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	1,510.90
iv)	Gravel/Soil Aggeregate Base/Sub-Base Nominal Maximum size Grading 80 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 80 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 capacity to achieve complete as per specification contained in para 2.2,3.6,3.7 of IRC SP 77-2008	cum	1108.40
v)	Gravel/Soil Aggeregate Base/Sub-Base Nominal Maximum size 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 approprite 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	1060.60
vi)	Gravel/Soil Aggeregate Base/Sub-Base Nominal Maximum size Grading 20 mm (Table 2.3 of IRC SP 77-2008		

Item No.	Description	Unit	Rate (Rs.)
	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 approprite 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	1018.90
vii)	Gravel/Soil Aggeregate Base/Sub-Base Nominal Maximum size Grading 10 mm (Table 2.3 of IRC SP 77-2008		
	Construction of Gravel/Soil aggregrete Base/Surface by providing well graded material of nominal maximum size grading 10 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 80-100kn static roller capacity to achieve the desired density complete as per specifications contained in para 2.2,3.6 and 3.7 of IRC SP 77-2008.	cum	932.70
viii)	Gravel/Soil Aggeregate Base/Sub-Base Nominal Maximum size Grading 5 mm (Table 2.3 of IRC SP 77-2008		
	Construction of Gravel/Soil aggregrete 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 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 asper para 2.2,3.6 and 3.7 of IRC SP 77-2008.	cum	891.00
4.3	**Gravel/Soil-Aggregregate surface course (table 400.3)**		
	(Only for PMGSY work)		
	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	1,280.00
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	365.20
(B)	By Mechanical Means	cum	323.10
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	585.90
4.6	Cement Treated Soil Sub-Base/Base		

Item No.	Description	Unit	Rate (Rs.)
	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	642.40
4.7	**Water Bound Macadam Sub-base/base**		
	(Only for PMGSY work)		
I	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	2,656.40
B	By Mechanical Means	cum	2,686.20
II	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	2,823.80
B	By Mechanical Means	cum	2,522.30
III	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	2,867.80
B	By Mechanical Means	cum	2,662.90
4.8	**Water Bound Macadam with Crushable Screenings**		
	(Only for PMGSY work)		
I	**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	2,714.80

Item No.	Description	Unit	Rate (Rs.)
B	By Mechanical Means	cum	2,419.30
II	**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	2,706.00
B	By Mechanical Means	cum	2,504.20
III	**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	2,827.20
B	By Mechanical Means	cum	2,583.10
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 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	cum	2,143.60
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	631.60

Item No.	Description	Unit	Rate (Rs.)
(ii)	Using Gravel mix soil using	cum	478.70
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	1,118.60
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 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	930.80
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	1,447.80
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	666.50
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	2,190.20
ii	With 37.5 mm maximum size of aggregates	cum	1,981.30
B	By mixing plant method		

Item No.	Description	Unit	Rate (Rs.)
i	With 53 mm maximum size of aggregates	cum	2,401.60
ii	With 37.5 mm maximum size of aggregates	cum	2,042.40
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	635.10
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	792.70

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 5 - BASES AND SURFACE COURSES (BITUMINOUS)			
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	35.20
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	43.30
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	55.40
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	9.90
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	11.80
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	11.80
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	13.80
5.3	**Bituminous Macadam**		
(i)	Providing and laying bituminous macadam with hot mix 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.	cum	6,534.40
(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	9,095.80
5.4	**Built-Up Spray Grout**		

Item No.	Description	Unit	Rate (Rs.)
	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	343.10
(ii)	Bitumen (S-65)	sqm	345.80
B	By Mechanical Means(S90)	sqm	281.00
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	207.90
B	75 mm thick		
(i)	Bitumen (S-90)	sqm	269.60
(ii)	Bitumen (S-65)	sqm	271.40
5.6	**Surface Dressing using Bituminous (Penetrations grade / modified bitumen) Binder**		
	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	84.90
ii)	Bitumen (S-65)	sqm	85.80
iii)	Polymer Modified Bitumen	sqm	85.60
iv)	Crumb Rubber Modified Bitumen	sqm	83.30
	Case – II: Nominal chipping size 9.5 mm		
i)	Bitumen (S-90)	sqm	73.80
ii)	Bitumen (S-65)	sqm	74.60
iii)	Polymer Modified Bitumen	sqm	74.20
iv)	Crumb Rubber Modified Bitumen	sqm	72.40
B	By Mechanical Means		

Item No.	Description	Unit	Rate (Rs.)
	Case – I: Nominal chipping size 13.2 mm		
i)	Bitumen (S-90)	sqm	61.30
ii)	Bitumen (S-65)	sqm	62.20
iii)	Polymer Modified Bitumen	sqm	62.00
iv)	Crumb Rubber Modified Bitumen	sqm	60.70
	Case – II: Nominal chipping size 9.5 mm		
i)	Bitumen (S-90)	sqm	53.90
ii)	Bitumen (S-65)	sqm	54.70
iii)	Polymer Modified Bitumen	sqm	54.50
iv)	Crumb Rubber Modified Bitumen	sqm	52.50
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, 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	100.30
	Case – II: Nominal chipping size 9.5 mm	sqm	89.00
B	By Mechanical Means		
	Case – I: Nominal chipping size 13.2 mm	sqm	81.50
	Case – II: Nominal chipping size 9.5 mm	sqm	74.00
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	1,598.80
ii)	Bitumen (S-65)	cum	1,613.20
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	156.80
ii)	Bitumen (S-65)	sqm	155.40

Item No.	Description	Unit	Rate (Rs.)
iii)	Polymer Modified Bitumen	sqm	161.10
iv)	Crumb Rubber Modified Bitumen	sqm	151.20
	Case - II: By Mechanical Means		
i)	Bitumen (S-90)	sqm	121.80
ii)	Bitumen (S-65)	sqm	123.10
iii)	Polymer Modified Bitumen	sqm	122.90
iv)	Crumb Rubber Modified Bitumen	sqm	119.50
5.10	**20mm thick Open-Graded Premix Carpet**		
(i)	**Using Bitumen Emulsion as per Technical Specification clause 508.2**		
	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.	sqm	139.00
(ii)	**Using Cold mix Binder (Tailor made as per IRC:SP:100-2014)**		
	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 Cold Mix binder 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.	sqm	165.00
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	205.00
ii)	Bitumen (S-65)	sqm	206.90
iii)	Polymer Modified Bitumen	sqm	206.50
iv)	Crumb Rubber Modified Bitumen	sqm	201.50
v)	Using Cold mix Binder (Tailor made as per IRC:SP:100-2014)	sqm	230.32
	Type B		
i)	Bitumen (S-90)	sqm	194.10
ii)	Bitumen (S-65)	sqm	195.80
iii)	Polymer Modified Bitumen	sqm	195.40
iv)	Crumb Rubber Modified Bitumen	sqm	191.10

Item No.	Description	Unit	Rate (Rs.)
v)	Using Cold mix Binder (Tailor made as per IRC:SP:100-2014)	sqm	216.00
	By Mechanical Means		
	Type A		
i)	Bitumen (S-90)	sqm	148.60
ii)	Bitumen (S-65)	sqm	150.60
iii)	Polymer Modified Bitumen	sqm	150.20
iv)	Crumb Rubber Modified Bitumen	sqm	145.10
	0		
	Type B		
i)	Bitumen (S-90)	sqm	137.80
ii)	Bitumen (S-65)	sqm	139.40
iii)	Polymer Modified Bitumen	sqm	139.10
iv)	Crumb Rubber Modified Bitumen	sqm	134.70
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	65.90
ii)	Bitumen (S-65)	sqm	66.80
iii)	Polymer Modified Bitumen	sqm	66.20
iv)	Crumb Rubber Modified Bitumen	sqm	64.40
	Case - II : Type B		
i)	Bitumen (S-90)	sqm	44.50
ii)	Bitumen (S-65)	sqm	44.60
iii)	Polymer Modified Bitumen	sqm	44.40
iv)	Crumb Rubber Modified Bitumen	sqm	47.10
	Case - III : Type C		
i)	Bitumen (S-90)	sqm	56.60
ii)	Bitumen (S-65)	sqm	57.20
iii)	Polymer Modified Bitumen	sqm	56.80
iv)	Crumb Rubber Modified Bitumen	sqm	55.60
B.	By Mechanical Means		

Item No.	Description	Unit	Rate (Rs.)
	Case - I : Type A		
i)	Bitumen (S-90)	sqm	57.50
ii)	Bitumen (S-65)	sqm	58.40
iii)	Polymer Modified Bitumen	sqm	58.20
iv)	Crumb Rubber Modified Bitumen	sqm	56.00
	Case - II : Type B		
i)	Bitumen (S-90)	sqm	37.10
ii)	Bitumen (S-65)	sqm	37.70
iii)	Polymer Modified Bitumen	sqm	37.60
iv)	Crumb Rubber Modified Bitumen	sqm	38.10
	Case - III : Type C		
i)	Bitumen (S-90)	sqm	48.60
ii)	Bitumen (S-65)	sqm	49.10
iii)	Polymer Modified Bitumen	sqm	49.00
iv)	Crumb Rubber Modified Bitumen	sqm	47.50
	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-3 and 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.

6 New Item of Interlocking Concrete Block Pavement with M30 Grade of Concrete has been included in this Chapter.

Item No.	Description	Unit	Rate (Rs.)
Chapter 6 - CEMENT CONCRETE PAVEMENT			
6.1	**Granual Sub-base with Well Graded Material (Table 400.1)**		
(i)	For Grading I Material	cum	1,546.20
(ii)	For Grading II Material	cum	1,467.50
(iii)	For Grading III Material	cum	1,375.00
6.2	**Lime Treated Soil for Sub-base/ base**	cum	585.90
6.3	**Water Bound Macadam (WBM) - Sub-base**		
(A)	By Manual Means	cum	2,656.40
(B)	By Mechnical Means	cum	2,686.20
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	6,719.10
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	cum	5,995.90
	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		
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	2,339.20
6.7	**Inter locking concrete Block pavement**		
(A)	**Interlocking pavement block**		
(i)	Providing and laying interlocking concrete block pavement with M40 grade grade of concrete blocks having thickness 80mm as per technical specification clause 1504 complete including carriage.		
a)	Including Edge block/ Edge restraints	sqm	1,027.50

Item No.	Description	Unit	Rate (Rs.)
b)	Excluding Edge block/ Edge restraints	sqm	833.10
(ii)	Providing and laying interlocking concrete block pavement with M40 grade grade of concrete blocks having thickness 60mm as per technical specification clause 1504 complete including carriage.		
a)	Including Edge block/ Edge restraints	sqm	826.50
b)	Excluding Edge block/ Edge restraints	sqm	631.00
(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	112.20
	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).

Item No.	Description	Unit	Rate (Rs.)
Chapter 7 - CAUSEWAY AND SUBMERSIBLE BRIDGES			
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	6,719.10
7.6	**Apron with Stone Boulders/ CC Blocks as per Technical Specification Clause 1301**		
i)	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 Apron with Stone Boulders Laid in Wire Crates as per Drawings & Technical 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	
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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 8 - HILL ROADS			
8.1	Site Clearance		
8.2	Setting Out		
i)	Construction of reference pillars as per Fig. 1600.1 (b) as per drawing and Technical Specification Clause 1602.1	per Km	6,171.40
ii)	Construction of back piller as per Fig. 1600.1(c) as per drawing and Technical Specification Clause 1602.3	per Km	14,655.30
iii)	Construction of Job pillers as per Fig. 1600.1 (d) and Technical Specification Clause 1602.4	each	1,756.30
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	161.90
B	Extra for Every Additional Lift of 1.5 m or Part thereof	cum	16.80
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	94.10
B	Extra for Every Additional Lift of 1.5 m or Part thereof	cum	16.80
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	356.30
B	Extra for Every Additional Lift of 1.5 m or Part thereof	cum	26.30
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	147.50
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	337.00
B	Extra for Every Additional Lift of 1.5 m or Part thereof	cum	33.10
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	923.20
b)	Mechanical Means	cum	515.00
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		

Item No.	Description	Unit	Rate (Rs.)
	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	
8.5	Construction of Hill side Drain		
	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:			
	1.Quantities of material/work shall be as per Design and Drawing.		
	2.Earth work in excavation may be taken as per site conditions.		
	It may comprise of a number of sub-items depending upon the type		
	typy of soil/rock.		
8.6	Construction of catch water/Intercepting drain.		
	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		
i)	Earthwork in excavation for structure as per drawing and technical specificatuion		
	Rate as per item no 11.2 of chapter 11	cum	
	0		

Item No.	Description	Unit	Rate (Rs.)
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	31,276.20
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	
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	285.40
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	sqm	22.20
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	171.20

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 9 - PIPE CULVERTS			
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.		
	Rate as per item No.11.1 of Chapter 11	cum	113.00
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	5,216.10
(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	1,164.00
ii)	Laying (First Class) bedding on well compacted approved granular material as per Clause 1105 (ii)	cum	1,378.80
	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	9,883.40
	1000 mm dia	m	6,891.90
	600 mm dia	m	2,895.80
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 excavation, protection works, backfilling, concrete and masonry works in head walls and parapets Clause 1106.		
	1200 mm dia	m	11,908.40
	1000 mm dia	m	9,276.44
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	19,835.90
B)	1000 mm dia	m	14,587.30

Item No.	Description	Unit	Rate (Rs.)
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	23,885.90
B)	1000 mm dia	m	19,625.00
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		
	Rate as per item No.11.4 of Chapter 11	cum	
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		
	Rate as per item No.11.5 (ii) Chapter 11	cum	
B	In cement-lime mortar (1:0.5:4.5)		
	Rate as per item No.11.5 (iii) Chapter 11	cum	
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		
	Rate as per item No.11.6 (II) (ii) Chapter 11	cum	
B	In cement-lime mortar (1:0.5:4.5)		
	Rate as per item No.11.6 (II) (iii) Chapter 11	cum	
9.10	**Pointing with Cement Mortar (1:3) on brickwork as per technical specification Clause 613.3**		
	Rate as per item No.12.2 of Chapter 12	sqm	
9.11	**Plastering with Cement Mortar (1:4), 15 mm thick on brickwork in substructure as per technical specification**		
	Rate as per item No.12.3 of Chapter 12	sqm	
9.12	**Backfilling in Foundation Trenches as per drawing and technical specification Clause 1108**		
	Rate as per Item No.11.2 of Chapter 11	cum	
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**		
	Rate as per Item No.12.13 of Chapter 12	m	

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 10 - TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES			
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	1.01
ii	English and Roman	per cm height per letter	0.65
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	5,390.30
ii	600mm equilateral triangle	each	3,480.70
iii	600mm circular	each	4,730.80
iv	800mm x 600mm rectangular	each	6,670.00
v	600mm x 450mm rectangular	each	4,602.80
vi	600mm x 600mm square	each	5,488.80
vii	900mm side octagon	each	8,560.00
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	5,798.90
ii	600mm equilateral triangle	each	3,889.20
iii	600mm circular	each	5,139.30
iv	800mm x 600mm rectangular	each	7,078.60
v	600mm x 450mm rectangular	each	5,011.40
vi	600mm x 600mm square	each	5,897.30

Item No.	Description	Unit	Rate (Rs.)
vii	900mm side octagon	each	9,952.90
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	4,966.70
ii	600mm equilateral triangle	each	3,057.00
iii	600mm circular	each	4,307.20
iv	800mm x 600mm rectangular	each	6,246.40
v	600mm x 450mm rectangular	each	4,179.20
vi	600mm x 600mm square	each	5,065.10
vii	900mm side octagon	each	8,136.40
	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	4,281.70
ii	600mm equilateral triangle	each	2,961.20
iii	600mm circular	each	3,825.60
iv	800mm x 600mm rectangular	each	5,166.50
v	600mm x 450mm rectangular	each	3,737.20
vi	600mm x 600mm square	each	4,349.70
vii	900mm side octagon	each	7,153.90
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	12,300.20

Item No.	Description	Unit	Rate (Rs.)
(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	12,458.80
(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	11,516.00
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 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	sqm	8,910.30
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	12,720.20
(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 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	13,264.90
(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	11,835.50
B	Semi-Reflective Traffic Signs		
	Direction and place identification signs more than 0.90 sqm sign board		

Item No.	Description	Unit	Rate (Rs.)
	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 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	sqm	9,804.60
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	102.70
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	70.40
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	127.30
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	85.60
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	67.30
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 and printing, etc as per drawing and Technical Specification Clause 1703		
I)	5th Kilometre Stone (precast)	each	3,715.00
ii)	Ordinary Kilometer Stone (Precast)	each	2,220.50
iii)	200 m stone (precast)	each	590.50
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	624.20
10.12	G.I Barbed Wire Fencing 1.2 m high		

Item No.	Description	Unit	Rate (Rs.)
	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	260.70
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	430.80
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	1,414.20
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	1,199.00
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	21,987.00
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	each	1,345.00
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		

Item No.	Description	Unit	Rate (Rs.)
	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		
	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	548.50

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 11 - FOUNDATION			
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	113.00
	3 m to 6 m depth	cum	165.00
II	Ordinary rock (not requiring blasting)		
	Upto 3 m depth	cum	182.30
III	Hard rock (requiring blasting)	cum	429.30
IV	Hard rock (blasting prohibited)	cum	401.10
V	Marshy soil	cum	518.20
11.2	Fillling in foundation trenches as per drawing and technical specification Clause 305.3.9		
I	Sand filling	cum	1,455.10
ii	Earth filling (For marshy soil)	cum	179.10
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	4,986.20
B	With natural Gravel	cum	4,704.70
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	5,342.10
	Nominal mix 1:3.6 (Hand mixing)	cum	5,378.80
II	P.C.C grade M 15		
	Nominal mix (1:2.5:5)	cum	5,216.10
	Nominal mix 1:2.5:5 (Hand mixing)	cum	5,252.80
III	P.C.C Grade M20		
	Nominal mix (1:2:4)	cum	5,897.60
	Nominal mix 1:2:4 (Hand mixed)	cum	5,934.40
IV	R.C.C Grade M20	cum	6,259.20
V	R.C.C Grade M25	cum	6,671.30
B	**With natural Gravel**		
I	P.C.C Grade M 10		
	Nominal mix 1:3:6	cum	4,962.50
	Nominal mix 1:3:6 (Hand mixing)	cum	4,999.20

Item No.	Description	Unit	Rate (Rs.)
II	P.C.C Grade M15		
	Nominal mix 1:2.5:5	cum	4,899.80
	Nominal mix 1:2.5:5 (Hand mixing)	cum	4,936.50
III	P.C.C Grade M20		
	Nominal mix (1:2:4)	cum	5,507.20
	Nominal mix 1:2:4 (Hand mixed)	cum	5,543.90
IV	R.C.C Grade M20	cum	5,799.30
V	R.C.C Grade M25	cum	6,212.80
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	6,807.30
ii	Brick masonry in 1:4 cement mortar	cum	6,593.60
iii	Brick masonry in 1:6 cement mortar	cum	6,502.00
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	4,641.60
	In 1:4 cement mortar	cum	4,353.10
	in 1:6 Cement morter	cum	4,229.40
II	Coursed rubble masonry (2nd sort)		
	In 1:3 cement mortar	cum	5,373.60
	In 1:4 cement mortar	cum	4,991.50
	in 1:6 Cement morter	cum	4,831.20
III	Random Rubble Masonry		
	In 1:3 cement mortar	cum	5,876.40
	In cement mortar 1:4	cum	4,143.20
	in 1:6 Cement morter	cum	4,019.50
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	56,239.00
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	47,409.00
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	56,270.50

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 12 - SUBSTRUCTURE			
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	7,277.90
ii	In 1:4 Cement mortar	cum	7,064.70
iii	In 1:5 cement mortar	cum	7,026.20
iv	In 1:6 cement mortar	cum	6,949.30
12.2	**Pointing with cement mortar (1:3) on brickwork as per drawing and technical specification Clauses 613.3 and 1204**	10 sqm	637.70
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	1,295.70
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	5,088.10
	In 1:4 cement mortar	cum	4,785.20
	In 1:5 cement mortar	cum	4,579.20
	In 1:6 cement mortar	cum	4,492.60
II	Coursed Rubble masonry (2nd sort)		
	In 1:3 cement mortar	cum	5,344.50
	In 1:4 cement mortar	cum	4,639.10
	In 1:5 cement mortar	cum	4,578.20
	In 1:6 cement mortar	cum	4,456.30
III	Random rubble masonry		
	In 1:3 cement mortar	cum	5,617.70
	In 1:4 cement mortar	cum	5,079.20
	In 1:5 cement mortar	cum	5,002.20
	In 1:6 cement mortar	cum	4,848.40
12.5	**Plain/reinforced cement concrete in substructure complete as per drawings and technical specification Clauses 802, 804, 805, 806, 807, 1202 ans 1204**		
A	**With Crushed Stone**		
I	P.C.C grade M 15		
i)	Nominal mix (1:2.5:5)	cum	5,517.00
ii)	Nominal mix 1:2.5:5 (Hand mixing)	cum	5,555.80
II	P.C.C. grade M 20		

Item No.	Description	Unit	Rate (Rs.)
i)	Nominal mix (1:2:4)	cum	6,237.90
ii)	Nominal mix 1:2:4 (Hand mixed)	cum	6,276.70
III	RCC Grade M 20		
i)	For height upto 5 m	cum	6,620.00
ii)	For height above 5 m upto 10 m	cum	6,740.20
IV	RCC Grade M 25		
i)	For height upto 5 m	cum	7,073.00
ii)	For height above 5 m upto 10 m	cum	7,201.80
B	**With Natural Gravel**		
I	P.C.C grade M 15		
i)	Nominal mix (1:2.5:5)	cum	5,182.40
ii)	Nominal mix 1:2.5:5 (Hand mixing)	cum	5,221.30
II	P.C.C. grade M 20		
i)	Nominal mix (1:2:4)	cum	5,824.90
ii)	Nominal mix 1:2:4 (Hand mixed)	cum	5,863.80
III	RCC Grade M 20		
i)	For height upto 5 m	cum	6,134.00
ii)	For height above 5 m upto 10 m	cum	6,245.20
IV	RCC Grade M 25		
i)	For height upto 5 m	cum	6,587.00
ii)	For height above 5 m upto 10 m	cum	6,706.80
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	56,373.70
12.7	**Supplying, fitting and placing TMT (Fe-500 D) reinforcement bar (Other ISI approved TMT reinforcement bar (SAI/BISCON/THERMAX or equivalent)) in substructrue complete as per drawings and technical specification Clauses 1002, 1005, 1010 & 1202**	t	47,543.60
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	56,405.20
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.	119.20
12.10	**Backfilling behind abutment, wing wall and return wall complete as per drawings & technical specification Clause 1204.3.8**		

Item No.	Description	Unit	Rate (Rs.)
I	Granular material	cum	1,316.10
ii	Sandy material	cum	1,613.00
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	1,835.00
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	3.18
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	404.80
ii	With Natural Gravel	Running m	378.00
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.	634.90

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 13 - SUPERSTRUCTURE			
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	7,221.63
b)	Height from 5m to 10M	cum	7,522.53
c)	Height above 10 M	cum	7,823.43
ii	For nominal mix 1:2:4 (Hand mixed)		
a)	Height upto 5 M	cum	7,210.13
b)	Height 5m to 10M	cum	7,510.55
c)	Height above 10M	cum	7,810.97
iii	For design mix RCC M 20		
a)	Height upto 5M	cum	7,038.46
b)	Height 5Mto 10 M	cum	7,331.73
c)	Height above 10 M	cum	7,625.00
II	**R.C.C grade M 25**		
a)	Height upto 5M	cum	7,679.55
b)	Height from 5M to 10 M	cum	7,999.53
c)	Height above 10 M	cum	8,319.51
III	**R.C.C grade M 30**		
a)	Height upto 5M	cum	7,954.30
b)	Height from 5M to 10M	cum	8,285.73
c)	Height above 10M	cum	8,617.16
B	**With Natural Gravel**		
I	**R.C.C. grade M 20**		
i	For Nominal mix 1:2:4		
a)	Height upto 5M	cum	6,691.31
b)	Height from 5M to 10M	cum	6,970.11
c)	Height above 10M	cum	7,248.91
ii	Nominal mix 1:2:4 (Hand Mixed)		
a)	Height upto 5M	cum	6,679.80

Item No.	Description	Unit	Rate (Rs.)
b)	Height from 5M to 10M	cum	6,958.13
c)	Height above 10M	cum	7,236.45
iii	For Design mix RCC M 20		
a)	Height upto 5 M	cum	6,508.14
b)	Height from 5m to 10M	cum	6,779.31
c)	Height above 10 M	cum	7,050.48
II	**R.C.C. grade M 25**		
a)	Height upto 5M	cum	7,149.23
b)	Height from 5M to 10M	cum	7,447.11
c)	Height above 10M	cum	7,744.99
III	**R.C.C. grade M 30**		
a)	Height upto 5M	cum	7,423.98
b)	Height from 5M to 10 M	cum	7,733.31
c)	Height above 10 M	cum	8,042.64
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	57,715.00
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	48,884.90
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	57,746.50
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	12,760.70
B	With Natural Gravel	cum	12,305.50
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	2,445.30
13.7	Providing fitting and fixing mild steel railing complete as per drawing and technical specifications Clause 1208.2	Running m	2,864.50
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	1,453.90

Item No.	Description	Unit	Rate (Rs.)
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	6,851.60
13.10	**Drainage spouts complete as per drawing and technical specifications Clause 1209**	Nos.	1,658.20
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	5,015.40
ii	Nominal mix 1:2.5:5 (Hand mixing)	cum	5,012.60
B	**With Natural Gravel**		
I	Mix (1:2.5:5)	cum	4,711.30
ii	Mix 1:2.5:5 (Hand mixed)	cum	4,708.50
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	10,565.30
B	With Natural Gravel	cum	10,035.00
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	24,226.40
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 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**	Running m	13,219.10
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	1,719.80
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	3,267.30
ii	Providing and fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing and technical specifications	Running m	255.30
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	277.90
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	23.10

Item No.	Description	Unit	Rate (Rs.)
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	5,617.70
II	**Coursed rubble masonry (1st sort)**	cum	5,088.10
13.18	**Pointing with cement mortar (1:3) on brickwork in parapet as per technical specifications Clauses 613.3 and 1208.4**	10 sqm	637.70
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	1,295.70
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	5,517.00
ii	Nominal mix (1:2.5:5)	cum	5,555.80
B	**With Natural Gravel**		
I	Mix 1:2.5:5(Hand mixing)	cum	5,221.30
ii	Mix (1:2.5:5)	cum	5,182.40
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	15,708.40
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	11,257.60
ii	For Arch 4 m to 6 m span	cum	10,131.90
iii	For Arch less than 4 m span	cum	8,443.20
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**		

Item No.	Description	Unit	Rate (Rs.)
I	**RCC grade M20 (1:2.4) nominal mix**		
a)	For arch above 6 m span	cum	9,134.80
b)	For arch 4 m to 6 m span	cum	8,525.80
c)	For arch less than 4 m span	cum	7,916.80
II	**RCC Grade M 25**		
a)	For arch above 6 m span	cum	9,752.95
b)	For arch 4 m to 6 m span	cum	9,102.75
c)	For arch less than 4 m span	cum	8,452.55
B	**With Natural Gravel**		
I	**R.C.C.Grade M20 (1:2:4) nominal mix**		
a)	For arch above 6 m span	cum	8,471.90
b)	For arch 4 m to 6 m span	cum	7,907.10
c)	For arch less than 4 m span	cum	7,342.30
II	**R.C.C Grade M25**		
a)	For arch above 6 m span	cum	9,090.04
b)	For arch 4 m to 6 m span	cum	8,484.04
c)	For arch less than 4 m span	cum	7,878.04
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	7,236.60

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 14 - PROTECTION WORKS			
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	1,646.80
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	2,460.70
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	5,192.70
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	793.10
	Driven at least 900 mm below ground and 900 mm above ground on average	Running m	748.10
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	1,646.80
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	5,320.40
b)	Brick pitchng set in cement mortar 1:4	cum	5,964.90
14.6	**Providing and laying filter material underneath pitching in slopes complete as per drawing and technical specifications Clause 1302**	cum	1,813.60
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	3,847.00
ii	Cement conrete blocks grade M 15	cum	5,795.00
iii	Brick on edge laid in cement mortar (1:3)	cum	4,978.80
	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	2,297.40
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	7,252.90
ii	Coursed rubble masonary (2nd sort) in cement mortar (1:4)	cum	4,639.10
iii	Cement concrete grade M 10	cum	5,074.90

Item No.	Description	Unit	Rate (Rs.)
14.10	**Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less then 25 kg beyond curtain wall**	cum	1,341.90
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	4,151.60
ii	Brick masonry in cement mortar 1:4 in case of brick pitching	cum	5,867.80
iii	Cement concrete grade M 10 in case of concrete block pitching	cum	5008.20
	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	928.10
ii	Driven at least 900 mm below ground and 900 mm above ground on average	Running m	751.80
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	1,356.80
B	Driven at least 900 mm below ground and 900 mm above ground on average	Running m	937.50
C	Driven at least 600 mm below ground and 1200 mm above ground on average.	Running m	862.50
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	959.20
B	1st class bamboo (Bholuka or Barua) 85 mm to 100 mm dia	Running m	909.20
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	1,635.70
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	1,076.90

Item No.	Description	Unit	Rate (Rs.)
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	19,114.70
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	77.60

PART-C: MAINTENANCE & MISCELLENEOUS WORKS

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.

Item No.	Description	Unit	Rate (Rs.)
Chapter 15 - MAINTENANCE OF ROADS			
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	142.30
B	Mechanical Means	cum	113.70
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	73.70
	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	16.40
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	7,172.40
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	182.30
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	178.70
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	192.30
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 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	sqm	347.80
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	298.80
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	2.60
15.7	**Maintenance of Culverts**		

Item No.	Description	Unit	Rate (Rs.)
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	1,525.50
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	3,020.40
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	71.80
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	1,173.90
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	256.40
ii	Repair of RCC railing to bring it to the original shape, cleaning and repainting as per drawings and technical specification Clause 1911		
	RCC Railing	m	141.50
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	194.60
ii	Printing letters and figures of any shade with synthtic enamel paint of any approved colour to give an even shade	km	638.40
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	111.20
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	6.50
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	2.20
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	17.80
15.14	**Periodical Renewal to existing bituminous surface**		
1	Open graded Premix carpet 20 mm thick		
I)	Tack coat		

Item No.	Description	Unit	Rate (Rs.)
	Rates as per item 5.2 (ii)	sqm	
ii)	Pre-mix carpet using bituminous (penetration grade modified bitumen) binder		
	Rates as per item No. 5.9	sqm	
	OR		
iii)	Premix carpet using bitumen Emulsion		
	Rates as per item No. 5.10	sqm	
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	

Chapter-16

Miscellaneous items

Preamble

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

2 As per latest revised version of MoRD specification for rural RoadsSpecific importance to some new items alongwith few new technologies like cold mix, 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 has been included in this edition.

3 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.

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
		CHAPTER-16		
		MISCELLENEOUS ITEMS OF WORK		
		Soil stabilisation using woven Jute Geo-Textiles		
16.1		**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.	97.40
16.2		**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 MS 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.	114.80
16.3		**Open weave Jute Geo Textiles for control of surficial soil erosion:** (Supplying,testing and installation of 100cm wide woven jute geotextiles(JGT) 500 gm/sqm posseing tensile strength of 6.5kN/m on 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 MS 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.	45.70
		Soil/ Sub-Grade stabilisation using non-woven Geo-Textiles/ Geo-Grids		
16.4		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	180.70
16.5		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	314.60
		Soil/ Sub-Grade and Base course stabilisation using RBI-81 products		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.6		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	3607.70
16.7		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	3876.00
16.8		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	4438.00
16.9		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	4672.60
		Misc. Base/ Sub-base Works		
16.10		**Construction of Base/ Sub-base 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	3335.00
16.11		**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	2345.00
(ii)		**For Base course**	cum	1989.00
16.12		**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	364.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.13		**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 15 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	58.00
		Misc. Bituminous & Cold Mix Works		
16.14		**20mm thick Open-Graded Premix Carpet using Bituminous (penetration grade/ modified bitumen) Binder: Using Paver finisher hydrostatic with sensor control @ 75 cum per hour**		
		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.	sqm	166.27
16.15	**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.)		
I		Without anti stripping agent		
A		With Bitumen emulsion CRS-2		
(i)		19 mm nominal chipping size	sqm	89.80
(ii)		13 mm nominal chipping size	sqm	74.50
II		With anti stripping agent as per IS:14982 (Refer Appendix-5 of MoSRT&H specification)		
A		With Bitumen emulsion CRS-2		
(i)		19 mm nominal chipping size	sqm	89.80
(ii)		13 mm nominal chipping size	sqm	69.40
16.16	**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)		5.0 mm thickness	sqm	74.50
(ii)		3.0 mm thickness	sqm	51.00
(iii)		1.5 mm thickness	sqm	31.60
16.17	**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.)		
A		With Bitumen emulsion CSS-1 (IS:8887-2004)		
(i)		Without blinding	sqm	39.80
(ii)		Extra for blinding the fog spray	sqm	5.10
B		With Bitumen emulsion CSS-1h		
(i)		Without blinding	sqm	41.80

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(ii)		Extra for blinding the fog spray	sqm	5.10
16.18	**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.		
(i)		Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate	cum	12381.20
(ii)		Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate	cum	12519.10
(iii)		Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate	cum	8702.80
(iv)		Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate	cum	8812.50
16.19	**3004.3.3**	**Crack Filling:** (Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm)	Rm	4.10
16.20		**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.		
I		By manual means		
A		Case-1: Type A (11.2mm to2.36mm)		
(i)		Bitumen Emulsion (RS-2)	sqm	57.30
B		Case-II: Type-B (2.36mm to 180 micron)		
(i)		Bitumen Emulsion (RS-1)	sqm	42.20
C		Case III:Type-C (9.5mm to 2.36mm)		
(i)		Bitumen Emulsion (RS-2)	sqm	45.80
II		By mechanical means		
A		Case-1: Type A (11.2mm to2.36mm)		
(i)		Bitumen Emulsion (RS-2)	sqm	56.60
B		Case-II: Type-B (2.36mm to 180 micron)		
(i)		Bitumen Emulsion (RS-1)	sqm	45.00
C		Case III:Type-C (9.5mm to 2.36mm)		
(i)		Bitumen Emulsion (RS-2)	sqm	47.30
		GEOSYNTHETICS AND REINFORCED EARTH		
16.21		**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	1291.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.22		**Narrow Filter Sub-Surface Drain:** Construction of a narrow filter sub-surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3.5 including excavation and backfilling .	metre	1022.00
16.23		**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	414.00
16.24		**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	1169.00
16.25		**Reinforced Earth Retaining Wall:** (Reinforced earth retaining walls including four main components of (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 and (d) Earth fill with granular material which is to be retained by the wall complete as per Technical Specification and Drawings.		
I		18mm thick, M-35 grade RCC Facing elements of shape and size as per design and drawing with bearing pads, joint fillers, tie strips, fastener and all accessories and consumable complete.	sqm	2476.50
II		Assembling, joining and laying of reinforcing elements.		
A		With High Adherence Structural Reinforcing 40 x 5mm elements of Steel / Copper / Aluminium / Polymeric strips.		
(i)		Type-1: Galvanised Carbon Steel Strips	metre	343.00
(ii)		Type-2: Copper Strips	metre	1544.00
(iii)		Type-3: Aluminium Strips	metre	670.00
(iv)		Type-4: Stainless Steel Strips	metre	914.00
(v)		Type-5: Glass reinforced / Fibre reinforced Polymeric strips	metre	914.00
B		With Reinforcing elements of Synthetic Geogrids	sqm	471.00
III		Earth work including excavation, backfilling, grading and compaction with selected backfill soil in layers in Reinforced Earth works as per Technical specification and drawings.	cu.m.	167.60
IV		Construction of PCC strips level footing (35cm x 15cm) in M-15 grade concrete complete as per technical specification and drawing.	meter	330.90

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
V		Providing 600mm drainage bay behind RE wall with compacted granular material as per technical specification and drawing.	cum	1269.50
VI		Construction of crash barrier, parapet, coping beam with friction slab in M-30 grade concrete complete as per technical specification and drawing.	meter	1760.00
		Miscelleneous Road Pavement Works		
16.26		Labour for spreading metal gravel / granular material on the road surface as directed including dressing and cambering the formation and utilizing the loose earth in filling the depression as directed including carriage of gravel within 30m.	Cum	192.40
16.27		**Close graded Premix Surfacing using cationic Bitumen Emulsion SS-2 or Tailor made as per(IRC:SP:100-2014):** (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 Bitumen 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 8-10 kN static roller and finishing to required level and grades as per Technical Specification Clause 509)		
A		Manual Means		
(i)		Type-A	sqm	195.00
(ii)		Type-B	sqm	186.00
		Miscelleneous Road Appurtenances		
16.28		**RCC Guard Post:** Supplying, fitting and fixing RCC guard post 150cm long erected 75cm above the ground and 75cm below the ground with M-15 grade (nominal mix 1:2:4 with broken stone aggregate up to 20mm size) of cement concrete and required reinforcement tied in position with annealed black wire including centering, moulding the top, curing including painting concrete surfaces in 23cm strips upto 0.75m from the top alternately in black and white and having 2 nos. reflective band of desired shade etc. complete as per design and as directed.		
(a)		30 cm dia. RCC guard post with reinforcement of 6nos. 12mm dia TMT main steel bars and 6mm TMT/ MS stirrups at 15cm c/c.	Each	2239.00
(b)		15 cm dia. RCC guard post with reinforcement of 4nos. 12mm dia TMT main steel bars and 6mm TMT/ MS stirrups at 15cm c/c.	Each	1172.00
16.29		**Dressed Wood Guard Post:** Supplying, fitting and fixing 20cm to 25cm diameter Jungle Wood Dressed guard post of 150cm long erected 75cm above the ground and 75cm below the ground, fitted with horizantal struts size 50mm x 50mm x 550mm long at bottom with necessary nails necessary etc. including coal tarring one coat below ground and painting surfaces in 23cm strips upto 0.75m from the top alternately in black and white and having 2 nos. reflective band of desired shade etc. complete as per design and as directed.	Each	504.80
16.30		**RCC Pipe Delineator** Providing of hume pipe delineator, 250 mm in diameter, 1250 mm high, having 25mm skin thickness filled with earth for stability up to 5 cm from top and remaining filled with 1:3:6 c.c.in spherical segment to prevent percolation of water and emeded in c.c. (1:3:6) below ground level up to a depth of 500mm, 75mm thick cc surrounding the pipe, painted white as per approved drawing.	Each	2873.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.31		**Drum Delineator** Providing of metal drum/empty bitumen drum delineator, 600 mm in diameter, 800 mm high, filled with earth for stability up to 5 cm from top and remaining filled with 1:3:6 c.c. to prevent percolation of water, painted in circumferential strips of alternate black and white 120 mm wide all as per IRC:SP:55-2001and drawing.	Each	734.00
16.32		**Pre fabricated railing:** Providing,fitting and erecting pre fabricated railing of STRUCTURA materials having size of 2.00x0.90M in panels made of 25x25x2.6/40x40x2.6 vertical bars and 40x40x2.6/32x32x2.6 horizontal bars.The two end posts of each panel are founded with M-15 cement concrete up to a depth of 200mm with anti corrosive primer and paint etc. complete as per approved drawing and technical specification as directed..	metre	1508.20
16.33	408	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	324.50
B		Using Concrete Batching and Mixing Plant	metre	326.50
16.34		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	605.00
B		Using Concrete Batching and Mixing Plant	metre	606.40
16.35		**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.	metre	4449.50
16.36	810	**Metal Beam Crash Barrier, Type - A: "W" Metal Beam Crash Barrier** (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 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 150mm x 75mm x 5mm, 330mm long complete as per clause 810.)	metre	4293.90

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.37	810	**Metal Beam Crash Barrier, Type - A: "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	5968.90
16.38	803	**Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface**		
		Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes and conforming to the MoSrt&H specifications	sqm	501.00
16.39		**Portable Barricade in Construction Zone** (Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes , 150mmin width at an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001.	each	3426.80
16.40		**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	5370.70
16.41		**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) (cement concrete to be measured and paid separately)	each	18526.00
16.42		**Tree reflector** made of high intensity grade retro-reflectorised sheeting fixed over aluminium sheeting of 2mm/0.28mm thick firmly fixed with necessary galvanized nail.		
(a)		100mm dia/ 100mm x 100mm size	each	79.60
(b)		150mm dia/ 150mm x 150mm size	each	112.20
16.43		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	254.00
16.44		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	994.50
		Spurs & Palasiding Works		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.45		Single bamboo spur and palasiding of whole 2nd class bamboo (Jati or Bethua) 65mm to 75mm dia closely packed & driven, including fitting and fixing with half bamboo kamis horizantally in three rows with the cane or tieing wire complete and struts 1500 mm apart longitudinally and providing brush wood as per drawing and technical specification clause 1302.5 of MORD		
(a)		Driven at least 900mm below and 1800 mm above the ground on average.	meter	616.20
(b)		Driven at least 900mm below and 900 mm above the ground on average	meter	502.70
16.46		Single bamboo spur and palasiding of whole 1st class bamboo (Bholuka or Barua) 85mm to 100mm dia closely packed & driven, including fitting and fixing with half 2nd class bamboo (Jati or Bethua) bamboo kamis horizantally in three rows with the cane or tieing wire complete and struts 1500 mm apart longitudinally and providing brush wood as per drawing and technical specification clause 1302.5 of MORD.		
(a)		Driven at least 900mm below and 1800 mm above the ground on average.	meter	698.90
(b)		Driven at least 900mm below and 900 mm above the ground on average	meter	427.40
(c)		Driven at least 900mm below and 1200 mm above the ground on average	meter	397.70
16.47		Bamboo spur 'A' type with whole bamboo placed 230mm center to center driven 900mm below ground and 1200mm to 1500mm above the ground tied with 2nd class bamboo (Jati or Bethua) on either side at 450mm apart horizantally with galvanized wire etc. complete as per drawing and technical specifications.		
(a)		2nd class bamboo (Jati or Bethua) 65mm to 75mm dia.	meter	651.10
(b)		1st class bamboo (Bholuka or Barua) 85mm to 100mm dia.	meter	532.40
16.48		Bamboo single spur 'A' type with 1st class bamboo (Bholuka or Barua) 85mm to 100mm dia, driven closely placed 3m to 4m above the ground and 1.20m to 1.5m below the ground and tied with cane or coir string, half 2nd class bamboo (Jati or Bethua) kamis horizontally on both face placed not more than one meter apart including whole bamboo struts inside one meter apart and 2nos. of purlin at top and bottom fitted with vertical struts at 1500mm apart and filling with brushwood or jungle wood inside the spur complete as per drawing and technical specifications.	meter	914.20
16.49		Close bamboo toe walling with 65mm to 75mm diameter bamboos of length ranging from 1.2m to 3.0m driven at least 150mm c/c and provided with three horizontal split bamboo runner fixed with nails complete including coal tarring as directed (Rate inclusive of cost of the required quantity of tar)	meter	736.00
16.50		Double timber spur with two rows of 1st class local wood (Azar/ Nahar/ Nageswar/ Zarul) timber piles of 150mm to 200mm dia driven 800mm c/c apart upto minimum 2000mm below ground and 3600mm above ground and average placed at 800mm belt, bracing etc. of 100mm x 75mm size dia bolts and nuts etc. including coal tarring of timber members and necessary bamboo staging etc. as directed and as per drawing and technical specifications.	meter	25584.60
16.51		Supplying and filling up hollows of the timber spur to an average height of 3600mm above the ground with jungle wood branches as directed and as per drawing and technical specifications.	meter	55.10

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.52		Providing split bamboo digonally wooven lining over slope of bridges, abutement and road embakement etc. secured to the ground at least 70cm long bamboo pegs and half bamboo horizontally at 100cm center to center both ways complete as directed.	sqm	114.50
16.53		Supplying, fitting and fixing whole Bholuka or Barua bamboo pegs 85mm to 100mm dia, closely placed all round the hollows of spur fitted with necessary nail in the horizontal timber between 90 cm below ground and 360cm above ground on average (timber works will be paid for separately).		
(a)		For 360 cm above ground on average	meter	775.30
(b)		For 200 cm above ground on average	meter	619.30
0		**Earthwork by Head Load**		
16.54		Earthwork in filling in the guide bund by head load up to lead of 60m with approved quality all leads and lifts ramming and compacting with rammer weighing not less than 10kg and falling from height of not less than 90cm and sprinkling with water if necessary. earth is to collected after removing the 1st 20cm of top soil and should be free from grass, shrubs and other foreign matter and rate will be including payment of land compensation.	cum	90.10
(a)		Extra lead for each 30cm and part thereof beyond 60m up to a lead 200m.	cum	11.90
(b)		Extra lift for each 1.50m or part thereof beyond the initial lift of 1.50m	cum	11.90
		Miscelleneous Embankment Protection		
16.55		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.		
(a)		Part-1 Plantation Part	metre	83.60
(b)		Part-II Maintenance part	metre	28.60
16.56	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	15.30
16.57		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	28.60
(ii)		In rows 7.5 cm apart in either direction	sqm	52.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.58		Labour for laying apron with man size boulders by hand packing the stone with dry stone masonry template crosswalls to ensure regular and orderly deposition of the full intended quality of stone in the apron including labour for buildung these walls about one meter thick and to the full height of the specific thockness of the apron at interval of 30 meters all along the length of the apron with local carriage of stone within 60 meters complete.	cum	1295.40
16.59		**Stone masonry work:** Uncoursed rubble masonry work in all retaining wall, wing wall, abutement etc. in cement mortar 1;6 withoutside face stone roughly hammer dressed and inside (earthen side) undressed as per drawing and technical sopecifications including racking out joints and curing , supplying and carriage of stone as directed.	cum	5592.80
		Tree Plantation		
16.60		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	673.20
16.61		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	102176.50
		Geo-Bags		
16.62		Supplying, filling and laying in loose with Geo-textile bags of Type-A (1.30m x 0.70m) made of Geo textile non woven fabric sheets of 400 GSM manufactured from polyster/ polypropylene conforming to relevant ISO standard filled with specified sand/ silt from flood plain or adjacent char within a distance of 90 m of the work site including excavation, filling Geo bags with sand weighing 126.00 kg after filling, stitching the mouth of the filled bags with polypropylene or polyster complete as per technical specifications and as directed.		
(a)		With Boat	Bag	298.00
(b)		Without Boat	Bag	286.00
16.63		Supply, Stitching and Laying of Non wooven Geo textile Fabric sheet of 400 gsm	Sqm	210.00
16.64		Supplying, filling and laying in cages with Geo-textile bags of Type-A (1.30m x 0.70m) made of Geo textile non woven fabric sheets of 400 GSM manufactured from polyster/ polypropylene conforming to relevant ISO standard filled with specified sand/ silt from flood plain or adjacent char within a distance of 90 m of the work site including excavation, filling Geo bags with sand weighing 126.00 kg after filling, stitching the mouth of the filled bags with polypropylene or polyster thread by power driven double needle machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly in cages of PVC coated G.I.Gabion box of size 1.5m x 1.5m x 0.45m complete as per technical specifications and as directed.		
(a)		With Boat	Cage	1051.00
(b)		Without Boat	Cage	687.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.65		Earthwork in excavation in key cage of size 1.00m x 1.00m x 1.00m for anchoring geo fabrics mat including supply and filling of geo bags (bags are filled with sand/silt from flood plain or adjacent char within a distance of 90 m of the work site), filling geo bags with sand weighing 126kg after filling, stitching mouth with polyster/ polypropylene thread by power driven double needle machine, carrying the same to the site including all handling charges and local carriage from a distance of 150m complete as per technical specifications and as directed.	Cum	3461.00
16.66		Supplying, laying, fitting and fixing g-mat in doubled layer composite geo textile fabricated to form a three dimensional mattresses after filling sand by pump, the upper layer of mattress being heavily woven with polyproplyne fabric needle punched with a mixture of U.V. stabilized green fibres and cut tape yarns (Typical value of mass per unit area ASTM D5261) is 650g/sqm, tensile strength (ASTMD4595)is 45kn/m, pore size (ASTMD4751) is less than 0.35mm and UV stability (strength retained per ASTMD4355-92 @ 500hrs is 80%) the lower layer of the mattress being polypropyline wooven fabric, UV stabilized (Typical value of mass per unit area (ASTM D 4595) is greater than 80kn/m, pore size (ASTMD4751) is less than 0.35mm and UV stability (strength retained per ASTM4355-92 @ 500hrs is 80%). The sewing thread being of high tenacity polyster, continued parrell stitches positioned 350mm apart with a stitch length not exeeding 40mm anchoring by cutting trenches of 1.5m x 1m placing the mat filling earth filled cement bags anchorage at lower end, double locking chain stitch 3 stitch/inch including all charges complete. (Approved rate of CWC for the FMP scheme under WRD)	Sqm	2417.90
		Miscelleneous Bridge Works		
16.67		Providing and constructing temporary island for construction of pile foundation with depth of water upto 4.0m complete as per technical specification.	each	56383.70
16.68		Providing and constructing temporary island for construction of well foundation complete as per technical specification.		
(a)		For 6m dia. Well		
(i)		Depth of water above 1.0 m upto 2.0 m	each	115345.30
(ii)		Depth of water above 2.0 m upto 3.0 m	each	146526.20
(iii)		Depth of water above 3.0 m upto 4.0 m	each	165819.80
(b)		For 7m dia. Well		
(i)		Depth of water above 1.0 m upto 2.0 m	each	125338.40
(ii)		Depth of water above 2.0 m upto 3.0 m	each	161564.00
(iii)		Depth of water above 3.0 m upto 4.0 m	each	195643.20
(c)		For 8m dia. Well		
(i)		Depth of water above 1.0 m upto 2.0 m	each	134891.40
(ii)		Depth of water above 2.0 m upto 3.0 m	each	172001.50
(iii)		Depth of water above 3.0 m upto 4.0 m	each	209394.70
16.69		Greasing of Bearing with ULTRATACK AP3 grease including cleaeing of bearings with steel brush, removal of dusts and dirt with necessary scaffolding etc. complete as directed by the department.	each	1237.70
		Bamboo Bridge		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.70		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.	meter	12026.10
16.71		Construction of temporary Bamboo bridge of 3.70m clear road way with Bholuka or Barua Bamboo post 5nos. in each rows driven at least180cm. below ground level and rows not more than 150cm apart from center to center Bholuka or Barua Bamboo dham longitudinal groth both closely placed and tied with half bamboo 90cm to 120cm apart in both layers and ttwo layers of jati bamboo chattais (top layer should be digonally woven), 70 mm to 100 mm thick brushwood in between chattias should be tied with half jati bamboo on both ends, bamboo railing with bholuka or barua bamboo post placed at150cm apart jati or betua bamboo hand rails of two lines both side of every alternate rows.All tying must be done with cane or coir string and only mature bamboo should be used in work.	meter	3073.60
16.72		Making 120mm 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.	meter	933.40
		Timber Bridge		
16.73		Supplying and driving timber piles of 25cm to 30cm diameter, 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.)		
A		**Using Sal Timber**		
(a)		Mechanically with Rod monkey and crab winch		
(i)		Portion of pile actually driven underground.	meter	7526.00
(ii)		Portion of pile remaining above rground.	meter	7423.20
(b)		Manually with labour		
(i)		Portion of pile actually driven underground.	meter	6394.60
(ii)		Portion of pile remaining above rground.	meter	6287.20
B		**Using Azar/ Nahar/ Nageswar/ Zarul Timber**		
(a)		Mechanically with Rod monkey and crab winch		
(i)		Portion of pile actually driven underground.	meter	6596.00
(ii)		Portion of pile remaining above ground.	meter	6493.20
(b)		Manually with labour		
(i)		Portion of pile actually driven underground.	meter	5464.60
(ii)		Portion of pile remaining above rground.	meter	5357.20

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.74		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.)		
A		**Using Sal Wood**		
(a)		Underssed in floor planks, collars, bracing, standards, wheel guards, struts and railings, runner belts, rail, posts etc.	cum	3596.10
(b)		In track way planks (alternate nailing to be done with decking in a seggragate way.)	cum	41130.40
B		**Using Azar/ Nahar/ Nageswar/ Zarul Wood**		
(a)		Undressed in floor planks, collars, bracing, standards, wheel guards, struts and railings, runner belts, rail, posts etc	cum	28591.70
(b)		In track way planks (alternate nailing to be done with decking in a seggragate way.)	cum	34608.80
16.75		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 (Rate inclusive of cost of the required quantity of tar)		
(a)		**Using Sal Timber**	cum	3631.10
(b)		**Using Azar/ Nahar/ Nageswar/ Zarul Timber**	cum	28136.60
16.76		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 inclusive of cost of the required quantity of tar)		
(a)		**Using Sal Timber**	meter	6345.50
(b)		**Using Azar/ Nahar/ Nageswar/ Zarul Timber**	meter	5415.50
16.77		Scarfing and joining piles 25 cm to 30 cm diameter, dressed to heartwood of 90 cm in length includng supplying, fitting and fixing with 2 nos. of 50mm x 10mm MS FI clamps and 16 mm dia MS bolts and nuts etc. complete as directed. (Timber for piles and coal tarring shall be measured and paid separately.)	each Joints	1377.70
16.78		Labour for taking out old piles of timber bridge with necessary scaffolding, jati bamboos, jumper ropes etc, complete and stacking them at suitable places as directed.	each	1481.50
16.79		Labour for dismantling all members of the timber bridge (excluding piles) with necessary scaffolding, jati bamboos, jumper ropes etc, complete and stacking them at suitable places as directed (all members will be under custody of the contractor till taken over by the department)	meter	1186.60
16.80		Labour for driving timber piles of 25cm to 30cm diameter, dressed to heartwood marking length in every 30cm interval including coal tarring two (2) coats with best tar applied hot including providing ncessary scaffolding or staging (Rate inclusive of cost of the required quantity of tar)		
(a)		With Rod monkey and crab winch		
(i)		Portion of pile actually driven under ground	meter	617.40
(ii)		Portion of pile remaining over ground	meter	472.10
(b)		By use of labour		
(i)		Portion of pile actually driven under ground	meter	984.20
(ii)		Portion of pile remaining over ground	meter	648.60
16.81		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-Steel paints to be supplied by the contractor at his own costs) including all lead and lifts from PWD Godown.	Quintal	793.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.82		Labour for fitting and fixing RSJ beam, Old CI saddle etc. in position including necessary scaffolding and fixing necessary bolts and nuts, painting two coats complete as directed (Tar-Steel paints to be supplied by the contractor at his own costs)	Quintal	662.60
16.83		Labour for making and fitting MS F.I. Straps and cleats etc. in position including drilling holes complete with all lead and lifts from PWD Godown.	Quintal	3176.70
16.84		Supplying fitting and fixing "U" shaped flat iron strap making 0.5m x 0.3m size from 150mm x 12mm size MS flat including providing 10 bolts holes and fitting with 0.35m long 20mm dia MS bolts including fitting tightly with bearing beam, pile and RSJ beams etc. complete as directed.	Each	1590.30
16.85		Labour for fitting woodwork including sizing, supplying and fixing with new MS bolts, nuts, nails, spikes etc. and coal tarring with best tar applied hot as directed (Rate inclusive of cost of the required quantity of tar) complete with all lead and lifts from PWD Godown.		
(a)		Applying 2 (two) coats of Coal Tar	cu.m.	2750.10
(b)		Applying 1 (one) coats of Coal Tar	cu.m.	2207.10
16.86		Labour for fitting and fixing 25cm to 30cm diameter Log Beam including supplying and fixing necessary MS nuts and bolts etc. and coal tarring with best tar applied hot as directed (Rate inclusive of cost of the required quantity of tar)		
(a)		Applying 2 (two) coats of Coal Tar	meter	569.10
(b)		Applying 1 (one) coats of Coal Tar	meter	381.40
16.87		Labour for talking out old woodworks of bridge and the refitting the same including supplying and fixing necessary new MS bolts, nuts, spikes, nail etc. complete and coal tarring with best tar applied hot as directed (Rate inclusive of cost of the required quantity of tar)	cum	3448.70
16.88		Labour for talking out old Log Beam of bridge and the refitting the same including supplying and fixing necessary new MS bolts, nuts, spikes, nail etc. complete and coal tarring with best tar applied hot as directed (Rate inclusive of cost of the required quantity of tar)	meter	310.40
16.89		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.) x 50cm(Depth) x 5cm (circumferential length at bottom) and 25cm inside diameter at top, including fitting and fixing 3 (Three) nos. M.S. plate of size of 6mm x 50mm, 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 with necessary grooving for placing the MS plates and pile shoe.	Each	2116.10
0		**Repairing of Boat**		
16.90		Labour for haulding up boat and refloating the same after repair		
(a)		Mar boat	each	3595.10
(b)		Single boat	each	1790.10
16.91		Renewing rotton planks of boat with 25 mm to 38 mm thick timber planks including supplying and fitting with necessary nail etc. including coat tarring two coats applied hot.		
(a)		With Sal planks	sq.m	2644.90
(b)		With Cham or Lorul planks	sq.m	2184.60
16.92		Making good cracks of the joint boat with necessary jute mixed with putty of dhuna and flat nails including coaltarring after taking out old nails, rotten jute etc.	metre	31.80

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
16.93		Supplying, fitting and fixing kori (for boat) of wood of required sizes.		
(a)		With Sal timber	each	2706.40
(b)		With cham/sundi/nageswar/gamari timber	each	1911.00
16.94		Supplying sal wood helm for marboat 18cm dia 6.10m as per direction including fixing in position and coal tarring complete as directed.cham/nageswar wood helm for mar boat 13cm dia. 6.10m long as per direction including fixing in position and coal and coal tarring as directed.	each	6049.10
16.95		Supplying cham/nageswar wood helm for mar boat 13cm dia. 6.10m long as per direction including fixing in position and coal and coal tarring as directed.	each	3424.40
16.96		Renewing oars of wood plank complete as directed.		
(a)		Of Sal wood	each	1031.90
(b)		Of Cham wood	each	845.30
16.97		Supplying fitting and fixing in position koniaghosa of required size of wood to fit exactly at boat and coal tarring etc. complete as directed.		
(a)		Sal wood	each	296.90
(b)		Cham/ Sundi/ Gamari wood	each	213.20
16.98		Repariring or providing timber free board line 8cm by 5cm painted white with two coats of approved paint complete as directed.		
(a)		With Sal timber	metre	233.30
(b)		With Cham/ Sundi/ Gamari timber	metre	182.40
16.99		Refitting drop gates with necessary hinges, spikes, bolts and nuts etc. complete up to 6 tonne mar boat.	set of two	422.10
17.00		Refitting drop gates with necessary hinges, spikes, bolts and nuts etc. complete above 6 tonne mar boat.	set of two	592.90

PART-D: MAJOR ROADS & BRIDGE WORKS

[MORT&H SPECIFICATION]

Chapter-17

MAJOR ROADS & BRIDGE WORKS [MORT&H SPECIFICATION]

Preamble

1 This Chapter includes various Major Roads and Bridge Works, which are not covered by MORD specification for Rural Road 2004.

2 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.

3 As per latest revised version of MoRD specification for Rural Roads, Specific importance to some new items alongwith few new technologies like Dense Bituminous macadam, Semi dense Bituminous concrete, Bituminous concrete alongwith construction of major Bridges as per latest version of MORT&H 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) 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.

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
		CHAPTER-17		
		MAJOR ROADS & BRIDGE WORKS [MORT&H SPECIFICATION]		
		ROAD WORKS		
		BITUMINOUS BASES AND SURFACE COURSES:		
17.1	**507**	**Dense Graded Bituminous Macadam** (Providing and laying dense bituminous macadam 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 @ 4.0 to 4.5% by weight of total mix and filler transporting the hot miox 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. 507. complete in all respect. (including carriage of mixed materials up to 10.0 Km initial lead from mixing plant)(Including cost of testing of materials at site and laboratory as directed by the deptt.)		
I		**With hydrated lime/ cement as filler (refer table 500-9 of MoSRT&H specification)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (40 mm nominal size)	cum	7204.00
(ii)		for Grading II (19 mm nominal size)	cum	7281.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (40 mm nominal size)	cum	7229.00
(ii)		for Grading II (19 mm nominal size)	cum	7306.00
II		**With rock dust as filler (refer table 500-9 of MoSRT&H specification)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (40 mm nominal size)	cum	6952.00
(ii)		for Grading II (19 mm nominal size)	cum	7028.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (40 mm nominal size)	cum	6977.00
(ii)		for Grading II (19 mm nominal size)	cum	7054.00
III		**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)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (40 mm nominal size)	cum	7218.00
(ii)		for Grading II (19 mm nominal size)	cum	7294.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (40 mm nominal size)	cum	7243.00
(ii)		for Grading II (19 mm nominal size)	cum	7320.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.2	**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. including carriage of mixed materials up to 10.0 Km initial lead from mixing plant) (Including cost of testing of materials at site and laboratory as directed by the deptt.)		
I		**With hydrated lime/ cement as filler (refer table 500-9 of MoSRT&H specification)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (13 mm nominal size)	cum	7361.00
(ii)		for Grading II (10 mm nominal size)	cum	7743.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (13 mm nominal size)	cum	7388.00
(ii)		for Grading II (10 mm nominal size)	cum	7773.00
C		**With CRMB 55**		
(i)		for Grading I (13 mm nominal size)	cum	7103.00
(ii)		for Grading II (10 mm nominal size)	cum	7457.00
II		**With rock dust as filler (refer table 500-9 of MoSRT&H specification)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (13 mm nominal size)	cum	7109.00
(ii)		for Grading II (10 mm nominal size)	cum	7491.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (13 mm nominal size)	cum	7136.00
(ii)		for Grading II (10 mm nominal size)	cum	7521.00
C		**With CRMB 55**		
(i)		for Grading I (13 mm nominal size)	cum	6851.00
(ii)		for Grading II (10 mm nominal size)	cum	7205.00
III		**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)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (13 mm nominal size)	cum	7642.00
(ii)		for Grading II (10 mm nominal size)	cum	8056.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (13 mm nominal size)	cum	7669.00
(ii)		for Grading II (10 mm nominal size)	cum	8086.00
C		**With CRMB 55**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(i)		for Grading I (13 mm nominal size)	cum	7384.00
(ii)		for Grading II (10 mm nominal size)	cum	7770.00
IV		**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)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (13 mm nominal size)	cum	7390.00
(ii)		for Grading II (10 mm nominal size)	cum	7804.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (13 mm nominal size)	cum	7417.00
(ii)		for Grading II (10 mm nominal size)	cum	7834.00
C		**With CRMB 55**		
(i)		for Grading I (13 mm nominal size)	cum	7163.00
(ii)		for Grading II (10 mm nominal size)	cum	7518.00
V		**Using cold mix Binder SS-2 (as per IRC:SP:100-2014)**		
(i)		for Grading I (13 mm nominal size)	cum	8119.00
(ii)		for Grading II (10 mm nominal size)	cum	8074.00
17.3	**509**	**Bituminous Concrete:** Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % 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.509. complete in all respect. (including carriage of mixed materials up to 10.0 Km initial lead from mixing plant)(Including cost of testing of materials at site and laboratory as directed by the deptt.)		
I		**With hydrated lime/cement as filler (refer table 500-9 of MoSRT&H specification)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (19 mm nominal size)	cum	8651.00
(ii)		for Grading II (13 mm nominal size)	cum	8537.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (19 mm nominal size)	cum	8778.00
(ii)		for Grading II (13 mm nominal size)	cum	8664.00
II		**With rock dust as filler (refer table 500-9 of MoSRT&H specification)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (19 mm nominal size)	cum	8353.00
(ii)		for Grading II (13 mm nominal size)	cum	8240.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (19 mm nominal size)	cum	8502.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(ii)		for Grading II (13 mm nominal size)	cum	8389.00
III		**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)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (19 mm nominal size)	cum	8967.00
(ii)		for Grading II (13 mm nominal size)	cum	8853.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (19 mm nominal size)	cum	9116.00
(ii)		for Grading II (13 mm nominal size)	cum	9002.00
IV		**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)**		
A		**With 60/70 or VG-30 grade bitumen**		
(i)		for Grading I (19 mm nominal size)	cum	8691.00
(ii)		for Grading II (13 mm nominal size)	cum	8578.00
B		**With Polymer modified bitumen 70**		
(i)		for Grading I (19 mm nominal size)	cum	8841.00
(ii)		for Grading II (13 mm nominal size)	cum	8727.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
		BRIDGE WORKS		
		FOUNDATIONS		
17.4	**304**	**Excavation for Structures** (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.		
I		**Ordinary soil**		
A		**Manual Means**		
		(I) Without dewatering		
(i)		upto 3 m depth	cum	122.00
(ii)		3 m to 6 m depth	cum	161.00
(iii)		Above 6 m depth	cum	209.00
		(II) With dewatering		
(i)		upto 3 m depth	cum	134.00
(ii)		3 m to 6 m depth	cum	180.00
(iii)		Above 6 m depth	cum	230.00
B		**Mechanical Means**		
		(I) Without dewatering		
(i)		Depth upto 3 m	cum	67.00
(ii)		Depth 3 m to 6 m	cum	77.00
(iii)		Depth above 6m	cum	93.00
		(II) With dewatering		
(i)		Depth upto 3 m	cum	71.00
(ii)		Depth 3 m to 6 m	cum	82.00
(iii)		Depth above 6m	cum	102.00
II		**Ordinary rock (not requiring blasting)**		
A		Manual Means		
		(I) Without dewatering		
		Depth upto 3 m	cum	177.00
		(ii)With dewatering		
		Depth upto 3 m	cum	192.00
B		Mechanical Means		
		(I) Without dewatering		
		Depth upto 3 m	cum	86.00
(ii)		With dewatering		
		Depth upto 3 m	cum	94.00
III		**Hard rock (requiring blasting)**		
A		Manual Means		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
		(I) Without dewatering	cum	425.00
		(ii) With dewatering	cum	462.00
IV		**Hard rock (blasting prohibited)**		
A		Mechanical Means		
		(I) Without dewatering	cum	490.00
		(ii) With dewatering	cum	539.00
V		**Marshy soil**		
(i)		upto 3 m depth		
A		Manual means		
		(I) Without dewatering	cum	453.00
		(ii) With dewatering	cum	557.00
B		Mechanical Means		
		(I) Without dewatering	cum	154.00
		(ii) With dewatering	cum	184.00
VI		Back Filling in Marshy Foundation Pits	cum	304.00
17.5	**304**	**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	4946.00
17.6	**304**	Sand Filling in Foundation Trenches as per Drawing & Technical Specification	cum	1338.00
17.7	**2100**	**PCC 1:3:6 in Foundation** (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	cum	4946.00
17.8	**1300**	Brick masonry work in cement mortar 1:3 in foundation complete excluding pointing and plastering, as per drawing and technical specifications	cum	6203.00
A		Cement mortar1:3 (1cement :3 sand)	cum	4502.00
B		Cement mortar1:2 (1cement :2 sand)	cum	5418.00
C		Cement mortar1:4 (1cement :4 sand)	cum	3889.00
D		Cement mortar1:6 (1cement :6 sand)	cum	3363.00
17.9	**1400**	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	4073.00
(b)	**1405.3**	Random Rubble Masonry	cum	3779.00
17.10	**1500,1700 & 2100**	**Plain/Reinforced cement concrete, in open foundation complete as per drawing and technical specification including steel shuttering formwork.**		
I		**Without plasticiser**		
A		PCC Grade M15	cum	5382.00
B		PCC Grade M20	cum	6010.00
C		RCC Grade M20		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(i)		Using concrete mixer	cum	6194.00
(ii)		With Batching Plant, Transit Mixer and Concrete Pump	cum	7090.00
D		PCC Grade M25		
(i)		Using concrete Mixer	cum	6437.00
(ii)		With Batching Plant, Transit Mixer and Concrete Pump	cum	7335.00
E		RCC Grade M25		
(i)		Using concrete Mixer	cum	6626.00
(ii)		With Batching Plant, Transit Mixer and Concrete Pump	cum	7520.00
F		PCC Grade M30		
(i)		Using Concrete Mixer	cum	6470.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7360.00
G		RCC Grade M30		
(i)		Using Concrete Mixer	cum	6637.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7530.00
H		RCC Grade M35		
(i)		Using Concrete Mixer	cum	6726.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7615.00
II	**1500,1700 & 2100**	**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	6087.00
B		PCC Grade M20	cum	6891.00
C		(I)RCC Grade M20		
(i)		Using concrete mixer	cum	7083.00
(ii)		With Batching Plant, Transit Mixer and Concrete Pump	cum	7979.00
D		PCC Grade M25		
(i)		Using concrete Mixer	cum	7468.00
(ii)		With Batching Plant, Transit Mixer and Concrete Pump	cum	8365.00
E		RCC Grade M25		
(i)		Using concrete Mixer	cum	7666.00
(ii)		With Batching Plant, Transit Mixer and Concrete Pump	cum	8560.00
F		PCC Grade M30		
(i)		Using Concrete Mixer	cum	7513.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	8402.00
G		RCC Grade M30		
(i)		Using Concrete Mixer	cum	7683.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	8576.00
H		RCC Grade M35		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(i)		Using Concrete Mixer	cum	7807.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	8696.00
17.11	**1200**	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	48507.00
B		Assuming depth of water 4.0 m and height of island 4.5 m.	each	691436.00
C		Providing and constructing one span service road to reach island location from one pier location to another pier location	metre	3283.00
17.12	**1200 & 1900**	Providing and laying cutting edge of mild steel weighing 40 kg per metre for well foundation complete as per drawing and technical specification.	tonne	101742.00
17.13	**1200, 1500 & 1700**	**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	7147.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8208.00
(ii)		RCC M25 Grade		
Case I		Using concrete mixer	cum	7665.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8725.00
(iii)		RCC M30 Grade		
Case I		Using concrete mixer	cum	7696.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8757.00
(iv)		RCC M35 Grade		
Case I		Using concrete mixer	cum	7836.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8899.00
B		**Well steining**		
(I)		PCC M15 Grade	cum	5802.00
(ii)		PCC M20 Grade	cum	6357.00
(iii)		RCC M20 Grade		
Case I		Using concrete mixer	cum	6551.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7524.00
(iv)		PCC M25 Grade		
Case I		Using concrete mixer	cum	6825.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7958.00
(v)		RCC M25 Grade		
Case I		Using concrete mixer	cum	7026.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7998.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(vi)		PCC M30 Grade		
Case I		Using concrete mixer	cum	6877.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7848.00
(vii)		RCC M30 Grade		
Case I		Using concrete mixer	cum	7054.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8027.00
(viii)		RCC M35 Grade		
Case I		Using concrete mixer	cum	7183.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8158.00
(ix)		RCC M40 Grade (With Batching Plant, Transit Mixer and Concrete Pump)	cum	8200.00
C		**Bottom Plug**		
(i)		PCC Grade M20		
Case I		Using Concrete Mixer	cum	6421.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7264.00
(ii)		PCC Grade M25		
Case I		Using Concrete Mixer	cum	6658.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7499.00
(iii)		PCC Grade M30		
Case I		Using Concrete Mixer	cum	6707.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7550.00
(iv)		PCC Grade M35		
Case I		Using Concrete Mixer	cum	6820.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7660.00
D		**Intermediate plug**		
(I)		Grade M20 PCC		
Case I		Using Concrete Mixer	cum	6135.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	6994.00
(ii)		Grade M25 PCC		
Case I		Using Concrete Mixer	cum	6361.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7216.00
(iii)		Grade M30 PCC		
Case I		Using Concrete Mixer	cum	6407.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7266.00
E		**Top plug**		
(i)		Grade M15 PCC		
Case I		Using Concrete Mixer	cum	5274.00
(ii)		Grade M20 PCC		
Case I		Using Concrete Mixer	cum	5779.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(iii)		Grade M25 PCC		
Case I		Using Concrete Mixer	cum	6205.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7235.00
(iv)		Grade M30 PCC		
Case I		Using Concrete Mixer	cum	6252.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7134.00
F		**Well cap**		
(i)		RCC Grade M20		
Case I		Using concrete Mixer	cum	6146.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7040.00
(ii)		RCC Grade M25		
Case I		Using concrete Mixer	cum	6626.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7521.00
(iii)		RCC Grade M30		
Case I		Using Concrete Mixer	cum	6637.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7529.00
(iv)		RCC Grade M35		
Case I		Using Concrete Mixer	cum	6726.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7615.00
(v)		RCC M40 Grade	cum	7718.00
(P)	**1200, 1500 & 1700**	**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	8070.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9130.00
(ii)		RCC M25 Grade		
Case I		Using concrete mixer	cum	8609.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9669.00
(iii)		RCC M30 Grade		
Case I		Using concrete mixer	cum	8647.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9710.00
(iv)		RCC M35 Grade		
Case I		Using concrete mixer	cum	8824.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9887.00
B		**Well steining**		
(I)		PCC M15 Grade	cum	6647.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(ii)		PCC M20 Grade	cum	7203.00
(iii)		RCC M20 Grade		
Case I		Using concrete mixer	cum	7398.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8369.00
(iv)		PCC M25 Grade		
Case I		Using concrete mixer	cum	7683.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8658.00
(v)		RCC M25 Grade		
Case I		Using concrete mixer	cum	7891.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8863.00
(vi)		PCC M30 Grade		
Case I		Using concrete mixer	cum	7746.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8715.00
(vii)		RCC M30 Grade		
Case I		Using concrete mixer	cum	7926.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8900.00
(viii)		RCC M35 Grade		
Case I		Using concrete mixer	cum	8088.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9063.00
(ix)		RCC M40 Grade	cum	9376.00
C		**Bottom Plug**		
(i)		PCC Grade M20		
Case I		Using Concrete Mixer	cum	7378.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	8221.00
(ii)		PCC Grade M25		
Case I		Using Concrete Mixer	cum	7701.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	8540.00
(iii)		PCC Grade M30		
Case I		Using Concrete Mixer	cum	7765.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	8608.00
(iv)		PCC Grade M35		
Case I		Using Concrete Mixer	cum	7915.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	8754.00
D		**Intermediate plug**		
(I)		Grade M20 PCC		
Case I		Using Concrete Mixer	cum	6850.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7709.00
(ii)		Grade M25 PCC		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
Case I		Using Concrete Mixer	cum	7139.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7994.00
(iii)		Grade M30 PCC		
Case I		Using Concrete Mixer	cum	7197.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	8077.00
E		**Top plug**		
(i)		Grade M15 PCC		
Case I		Using Concrete Mixer	cum	6043.00
(ii)		Grade M20 PCC		
Case I		Using Concrete Mixer	cum	6549.00
(iii)		Grade M25 PCC		
Case I		Using Concrete Mixer	cum	6984.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7871.00
(iv)		Grade M30 PCC		
Case I		Using Concrete Mixer	cum	7042.00
Case II		Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	7923.00
F		**Well cap**		
(i)		RCC Grade M20		
Case I		Using concrete Mixer	cum	7020.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7914.00
(ii)		RCC Grade M25		
Case I		Using concrete Mixer	cum	7666.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	8562.00
(iii)		RCC Grade M30		
Case I		Using Concrete Mixer	cum	7683.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	8575.00
(iv)		RCC Grade M35		
Case I		Using Concrete Mixer	cum	7807.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump	cum	8696.00
(v)		RCC M40 Grade Using Batching Plant, Transit Mixer and Concrete Pump	cum	8832.00
17.14	**1200**	**Sinking of 6 m external diameter well** (other than pneumatic method of sinking) **through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewedfrom bed level.**		
A		**Sandy soil**		
(i)		Depth below bed level upto 3.0 M	metre	4460.00
(ii)		Beyond 3m upto 10m depth	metre	6364.00
(iii)		Beyond 10m upto 20m	metre	8404.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	15764.00
b		For sinking including kentledge	metre	18917.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	37456.00
b		For sinking including kentledge	metre	44947.00
B		**Clayey soil (6m dia. Well)**		
(i)		Depth below bed level upto 3.0 M	metre	6388.00
(ii)		Beyond 3m upto 10m depth	metre	13531.00
(iii)		Beyond 10 m upto 20 m		
a		For sinking	metre	17870.00
b		For sinking including kentledge	metre	18764.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	33520.00
b		For sinking including kentledge	metre	41901.00
c		For sinking including kentledge & dewatering if required.	metre	43996.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	79640.00
b		For sinking including kentledge	metre	95568.00
c		For sinking including kentledge & dewatering if required.	metre	100346.00
C		**Soft rock (6m dia well)**		
(i)		Depth of soft rock strata upto 3m	metre	18305.00
D		Hard rock (6m dia well)		
(i)		Depth of soft rock strata upto 3m	metre	19443.00
17.15	**1200**	Sinking of 7 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
A		**Sandy soil**		
(i)		Depth below bed level upto 3.0 M	metre	6702.00
(ii)		Beyond 3m upto 10m depth	metre	9056.00
(iii)		Beyond 10m upto 20m	metre	11959.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	22431.00
b		For sinking including kentledge	metre	26917.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	53292.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
b		For sinking including kentledge	metre	63950.00
B		Clayey soil (7m dia. Well)		
(I)		Depth below bed level upto 3.0 M	metre	9056.00
(ii)		Beyond 3m upto 10m depth	metre	13313.00
(iii)		Beyond 10 m upto 20 m		
(a)		For sinking	metre	17582.00
b		For sinking including dewatering, if required., if required	metre	18462.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	32983.00
b		For sinking including kentledge	metre	41229.00
c		For sinking including kentledge & dewatering, if required.	metre	43291.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	78365.00
b		For sinking including kentledge		94038.00
c		For sinking including kentledge & dewatering, if required.	metre	98740.00
C		Soft rock (7m dia well)		
(i)		Depth of soft rock strata upto 3m	metre	15620.00
D		Hard rock (7m dia well)		
(i)		Depth upto 3 m	metre	22364.00
17.16	**1200**	Sinking of 8 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
A		**Sandy soil**		
(i)		Depth below bed level upto 3.0 M	metre	8267.00
(ii)		Beyond 3m upto 10m depth	metre	10190.00
(iii)		Beyond 10m upto 20m	metre	13458.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	25244.00
b		For sinking including kentledge	metre	30293.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	59977.00
b		For sinking including kentledge	metre	71972.00
B		**Clayey soil (8m dia. Well)**		
(i)		Depth upto 3.0 M	metre	11084.00
(ii)		Beyond 3m upto 10m depth	metre	13868.00
(iii)		Beyond 10 m upto 20 m		
a		For sinking	metre	18315.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
b		Adding for dewatering @ 5% of cost, if required.	metre	19230.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	34354.00
b		For sinking including kentledge	metre	42943.00
c		For sinking including kentledge & dewatering, if required.	metre	45090.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	81622.00
b		For sinking including kentledge	metre	97947.00
c		For sinking including kentledge & dewatering, if required.	metre	102844.00
C		**Soft rock (8m dia well)**		
(i)		Depth in soft rock strata upto 3m	metre	17470.00
D		Hard rock (8m dia well)		
(i)		Depth in hard rock strata upto 3 m	metre	22655.00
17.17	**1200**	Sinking of 9 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
A		**Sandy soil**		
(i)		Depth below bed level upto 3.0 M	metre	8368.00
(ii)		Beyond 3m upto 10m depth	metre	11180.00
(iii)		Beyond 10m upto 20m	metre	14765.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	27694.00
b		Adding 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	33234.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	65800.00
b		For sinking including kentledge	metre	78961.00
B		**Clayey soil (9m dia. Well)**		
(i)		Depth below bed level upto 3.0 M	metre	11704.00
(ii)		Beyond 3m upto 10m depth	metre	14953.00
(iii)		Beyond 10 m upto 20 m		
a		For sinking	metre	19749.00
b		For sinking including dewatering, if required	metre	20736.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	37045.00
b		For sinking including kentledge	metre	46306.00
c		For sinking including kentledge & dewatering, if required.	metre	48621.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	88012.00
b		For sinking including kentledge	metre	105615.00
c		For sinking including kentledge & dewatering, if required.	metre	110896.00
C		**Soft rock (9m dia well)**		
(i)		Depth upto 3m	metre	21001.00
D		Hard rock (9m dia well)		
(i)		Depth of hard rock strata upto 3 m	metre	26013.00
17.18	**1200**	Sinking of 10 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
A		**Sandy soil**		
(i)		Depth below bed level upto 3.0 M	metre	10046.00
(ii)		Beyond 3m upto 10m depth	metre	11810.00
(iii)		Beyond 10m upto 20m	metre	15597.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	29256.00
b		For sinking including kentledge	metre	35107.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	69507.00
b		Adding 20% of cost for Kentledge including supports, loading arrangement, and Labour etc	metre	83409.00
B		**Clayey soil (10m dia. Well)**		
(i)		**Depth below bed level upto 3.0 M**	metre	12895.00
(ii)		**Beyond 3m upto 10m depth**	metre	14719.00
(iii)		**Beyond 10 m upto 20 m**		
a		For sinking	metre	19439.00
b		Adding for dewatering @ 5% of cost, if required.	metre	20411.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	36463.00
b		For sinking including kentledge	metre	45578.00
c		For sinking including kentledge & dewatering, if required.	metre	47857.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	86631.00
b		For sinking including kentledge		103957.00
c		For sinking including kentledge & dewatering, if required.	metre	109155.00
C		**Soft rock (10m dia well)**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(i)		Depth of soft rock strata upto 3m	metre	22428.00
D		**Hard rock (10m dia well)**		
(i)		Depth of hard rock strata upto 3 m	metre	29684.00
17.19	**1200**	Sinking of 11 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is rekonewed from bed level.		
A		**Sandy soil**		
(i)		Depth from bed level upto 3.0 M	metre	23103.00
(ii)		Beyond 3m upto 10m depth	metre	18301.00
(iii)		Beyond 10m upto 20m	metre	24170.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	45339.00
b		For sinking including kentledge	metre	54407.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	107721.00
b		For sinking including kentledge	metre	129265.00
B		**Clayey soil (11 m dia. Well)**		
(i)		Depth from bed level upto 3.0 M	metre	21494.00
(ii)		Beyond 3m upto 10m depth	metre	30329.00
(iii)		Beyond 10 m upto 20 m		
a		For sinking	metre	40053.00
b		For sinking including dewatering, if required	metre	42056.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	75129.00
b		For sinking including kentledge	metre	93911.00
c		For sinking including kentledge & dewatering, if required.	metre	98607.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	178497.00
b		For sinking including kentledge	metre	214196.00
c		For sinking including kentledge & dewatering, if required.	metre	224906.00
C		**Soft rock (11m dia well)**		
(i)		Depth of soft rock strata upto 3m	metre	50326.00
D		**Hard rock (11m dia well)**		
(i)		Depth of hard rock upto 3 m	metre	66431.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.20	**1200**	Sinking of 12 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against 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	47780.00
(ii)		**Beyond 3m upto 10m depth**	metre	53814.00
(iii)		**Beyond 10m upto 20m**	metre	71071.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	133310.00
b		For sinking including kentledge	metre	159972.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	316723.00
b		For sinking including kentledge	metre	380068.00
B		**Clayey soil (12 m dia. Well)**		
(i)		**Depth below bed level upto 3.0 M**	metre	52679.00
(ii)		**Beyond 3m upto 10m depth**	metre	76695.00
(iii)		**Beyond 10 m upto 20 m**		
a		For sinking	metre	101290.00
b		For sinking including dewatering, if required	metre	106355.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	189994.00
b		For sinking including kentledge	metre	237492.00
c		For sinking including kentledge & dewatering, if required.	metre	249367.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	451397.00
b		For sinking including kentledge	metre	541677.00
c		For sinking including kentledge & dewatering	metre	568761.00
C		**Soft rock (12m dia well)**		
(i)		**Depth of soft rock strata upto 3m**	metre	118540.00
D		**Hard rock (12m dia well)**		
(i)		**Depth of hard rock strata upto 3 m**	metre	150689.00
17.21	**1200**	Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as 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	10811.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(ii)		**Beyond 3m upto 10m depth**	metre	11674.00
(iii)		**Beyond 10m upto 20m**	metre	15419.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	28921.00
b		For sinking including kentledge	metre	34705.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	68716.00
b		For sinking including kentledge	metre	82459.00
B		**Clayey soil (Twin D Type Well)**		
(i)		**Depth below bed level upto 3.0 M**	metre	12719.00
(ii)		**Beyond 3m upto 10m depth**	metre	16301.00
(iii)		**Beyond 10 m upto 20 m**		
a		For sinking	metre	21529.00
b		For sinking including dewatering, if required	metre	22606.00
(iv)		Beyond 20m upto 30 m		
a		For sinking	metre	40382.00
b		For sinking including kentledge	metre	50477.00
c		For sinking including kentledge & dewatering, if required.	metre	53001.00
(v)		Beyond 30m upto 40 m		
a		For sinking	metre	95942.00
b		For sinking including kentledge	metre	115131.00
c		For sinking including kentledge & dewatering, if required.	metre	120887.00
C		**Soft rock (Twin D Type well)**		
(i)		**Depth of soft rock strata upto 3m**	metre	25229.00
D		**Hard rock (Twin D Type well)**		
(i)		**Depth of hard rock strata upto 3 m**	metre	32000.00
17.22		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		
17.23	**1207**	Sand filling in wells complete as per drawing and technical specifications	cum	1338.00
17.24	**1200 & 1900**	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	92294.00
17.25	**1100 & 1700**	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-750 mm)	metre	6076.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.26	**1101 & 1700**	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. 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	6455.00
17.27	**1100,1600 & 1700**	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-1000 mm)	metre	10173.00
17.28	**1100,1600 & 1701**	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-1000 mm)	metre	10846.00
17.29	**1100&1700**	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-1200 mm)	metre	13383.00
17.30	**1100&1701**	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	14352.00
17.31	**1100 & 1700**	Driven cast-in-place vertical M35 grade R.C.C. pile excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 750 mm)	metre	4293.00
17.32	**1101 & 1700**	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	4672.00
17.33	**1100 & 1700**	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	7246.00
17.34	**1100 & 1700**	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	7920.00
17.35	**1100&1700**	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	10508.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.36	**1100&1701**	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	11478.00
17.37	**1100**	**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
17.38	**1100, 1500 & 1700**	**Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification.**		
A		**RCC Grade M20**		
(i)		Using Concrete Mixer	cum	6146.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	5972.00
B		RCC Grade M25		
(i)		Using concrete mixer.	cum	6610.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	6450.00
C		RCC Grade M30		
(i)		Using concrete mixer.	cum	6669.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	6495.00
D		RCC Grade M35		
(i)		Using concrete mixer.	cum	6791.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	6631.00
17.39	**1100, 1500 & 1700**	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	6832.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	6659.00
B		RCC Grade M25		
(i)		Using concrete mixer.	cum	7420.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7260.00
C		RCC Grade M30		
(i)		Using concrete mixer.	cum	7493.00
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7320.00
D		RCC Grade M35		
(i)		Using concrete mixer.	cum	7647.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(ii)		Using Batching Plant, Transit Mixer and Concrete Pump	cum	7487.00
17.40	1100 &1700	Levelling course for Pile cap	cum	5152.00
17.41	1600	**Reinforcement in Foundation:** Supplying, fitting and placing TMT IS:1786 Fe500 D bar reinforcement in foundation complete as per drawing and technical specifications		
(a)		TMT-IS 1786 (Fe-500 D) Primary Producer (TATA/ SAIL/ Esser Steel/ Jindal panther steel/ Shyam steel or equivalent)	tonne	56744.00
		SUB-STRUCTURE		
17.42	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications	cum	7280.00
17.43	1300 & 2200	Pointing with cement mortar (1:3) on brick work in substructure as per Technical specifications	sqm	66.00
17.44	1300 & 2200	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical specifications	sqm	128.00
17.45	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications		
A		Random Rubble Masonry	cum	3803.00
B		Coursed rubble masonry (first sort)	cum	3999.00
C		Ashlar masonry (first sort)	cum	5380.00
17.46	**1500,1700 & 2200**	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	5802.00
		Height upto 5m		
B		**PCC Grade M20**	cum	6357.00
		Height upto 5m		
C		**PCC Grade M25**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	6825.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7958.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7074.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8247.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	7384.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8609.00
D		**PCC Grade M30**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	6877.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7848.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7127.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8133.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	7440.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8490.00
E		**RCC Grade M20**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	6551.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7524.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	6789.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7798.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	7087.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	6527.00
F		**RCC Grade M25**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7026.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7998.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7026.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	7998.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	7601.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8652.00
G		**RCC Grade M30**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7054.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8027.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7253.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8253.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	7599.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8648.00
H		**RCC Grade M35**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7183.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8158.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7340.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8336.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	7575.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8603.00
(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	6647.00
B		**PCC Grade M20**		
		Height upto 5m	cum	7203.00
C		**PCC Grade M25**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7683.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8658.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7962.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8247.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	8311.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9367.00
D		**PCC Grade M30**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7746.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8715.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	8028.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9032.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	8380.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9428.00
E		**RCC Grade M20**		
a		Height upto 5m		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
Case I		Using concrete Mixer	cum	7398.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8369.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	7667.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8674.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	8003.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9054.00
F		**RCC Grade M25**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7891.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8863.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	8150.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9153.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	8537.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9588.00
G		**RCC Grade M30**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	7926.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	8900.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	8149.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9151.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	8467.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9507.00
H		**RCC Grade M35**		
a		Height upto 5m		
Case I		Using concrete Mixer	cum	8088.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9063.00
b		Height 5m to 10m		
Case I		Using concrete Mixer	cum	8265.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9261.00
c		Height above 10m		
Case I		Using concrete Mixer	cum	8530.00
Case II		With Batching Plant, Transit Mixer and Concrete Pump	cum	9557.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.47		**Supplying, fitting and placing TMT IS:1786 (Fe 500) bar reinforcement in sub-structure complete as per drawing and technical specifications**		
(a)		TMT-IS 1786 (Fe-500 D) Primary Producer (TATA/ SAIL/ Esser Steel/ Jindal panther steel/ Shyam steel or equivalent)	tonne	56880.00
17.49		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	182.00
17.50		Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification		
A		Granular material	cum	1326.00
B		Sandy material	cum	1326.00
17.51		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	1768.00
17.52		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	666.00
17.53		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	576.00
17.54		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	309.00
17.55		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	1.21
17.56		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	174.00
17.57		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	196.00
		SUPER-STRUCTURE		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.58		**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	7091.00
b		Height 5m to 10m	cum	7387.00
c		Height above 10m	cum	7682.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	7387.00
b		Height 5m to 10m	cum	7682.00
c		Height above 10m	cum	7978.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8124.00
b		Height 5m to 10m	cum	8462.00
c		Height above 10m	cum	8801.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	8462.00
b		Height 5m to 10m	cum	8801.00
c		Height above 10m	cum	9139.00
B		**RCC Grade M25**		
Case I		**Using Concrete Mixer**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	7627.00
b		Height 5m to 10m	cum	7945.00
c		Height above 10m	cum	8262.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	7945.00
b		Height 5m to 10m	cum	8262.00
c		Height above 10m	cum	8580.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8667.00
b		Height 5m to 10m	cum	9028.00
c		Height above 10m	cum	9389.00
(ii)		**For T-beam & slab**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
a		Height upto 5m	cum	9028.00
b		Height 5m to 10m	cum	9389.00
c		Height above 10m	cum	9750.00
C		**RCC Grade M 30**		
Case I		**Using Concrete Mixer**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	7723.00
b		Height 5m to 10m	cum	8044.00
c		Height above 10m	cum	8366.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	8044.00
b		Height 5m to 10m	cum	8366.00
c		Height above 10m	cum	8688.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump.**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8693.00
b		Height 5m to 10m	cum	9056.00
c		Height above 10m	cum	9418.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	9056.00
b		Height 5m to 10m	cum	9418.00
c		Height above 10m	cum	9780.00
D		**RCC/PSC Grade M35**		
Case 1		**Using concrete mixer.**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	7733.00
b		Height 5m to 10m	cum	8061.00
c		Height above 10m	cum	8388.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	8061.00
b		Height 5m to 10m	cum	8388.00
c		Height above 10m	cum	8716.00
(iii)		**For box girder and balanced cantilever**		
a		Height upto 5m	cum	9044.00
b		Height 5m to 10m	cum	9699.00
c		Height above 10m	cum	10354.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump**		
(i)		**For solid slab super-structure**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
a		Height upto 5m	cum	8682.00
b		Height 5m to 10m	cum	9050.00
c		Height above 10m	cum	9417.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	9050.00
b		Height 5m to 10m	cum	9417.00
c		Height above 10m	cum	9785.00
(iii)		**For box girder and balanced cantilever**		
a		Height upto 5m	cum	10153.00
b		Height 5m to 10m	cum	10889.00
c		Height above 10m	cum	11625.00
E		**PSC Grade M-40**		
Case 1		Using concrete mixer.		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	7991.00
b		Height 5m to 10m	cum	8324.00
c		Height above 10m	cum	8657.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	8324.00
b		Height 5m to 10m	cum	8657.00
c		Height above 10m	cum	8990.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8761.00
b		Height 5m to 10m	cum	9132.00
c		Height above 10m	cum	9503.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	9132.00
b		Height 5m to 10m	cum	9503.00
c		Height above 10m	cum	9875.00
(iii)		**For box girder and balanced cantilever**		
a		Height upto 5m	cum	10246.00
b		Height 5m to 10m	cum	10988.00
c		Height above 10m	cum	11731.00
F		**PSC Grade M-45**		
(i)		**For solid slab/voided slab super-structure**		
a		Height upto 5m	cum	8925.00
b		Height 5m to 10m	cum	9309.00
c		Height above 10m	cum	9694.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(ii)		**For I-beam & slab including launching of precast girders by launching truss upto 40 m span**		
a		Height upto 5m	cum	9309.00
b		Height 5m to 10m	cum	9694.00
c		Height above 10m	cum	10079.00
(iii)		**For cast-in-situ box girder, segmental construction and balanced cantilever**		
a		Height upto 5m	cum	10464.00
b		Height 5m to 10m	cum	11233.00
c		Height above 10m	cum	12002.00
G		**PSC Grade M-50**		
(i)		**For cast-in-situ box girder, segmental construction and balanced cantilever**		
a		Height upto 5m	cum	10646.00
b		Height 5m to 10m	cum	11435.00
c		Height above 10m	cum	12224.00
H		**PSC Grade M- 55**		
(i)		**For cast-in-situ box girder, segmental construction and balanced cantilever**		
a		Height upto 5m	cum	11053.00
b		Height 5m to 10m	cum	11872.00
c		Height above 10m	cum	12691.00
(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	8100.00
b		Height 5m to 10m	cum	8437.00
c		Height above 10m	cum	8775.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	8437.00
b		Height 5m to 10m	cum	8775.00
c		Height above 10m	cum	9112.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	9035.00
b		Height 5m to 10m	cum	9411.00
c		Height above 10m	cum	9788.00
(ii)		**For T-beam & slab**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
a		Height upto 5m	cum	9411.00
b		Height 5m to 10m	cum	9788.00
c		Height above 10m	cum	10164.00
B		**RCC Grade M25**		
Case I		**Using Concrete Mixer**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8818.00
b		Height 5m to 10m	cum	9186.00
c		Height above 10m	cum	9553.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	9186.00
b		Height 5m to 10m	cum	9553.00
c		Height above 10m	cum	9921.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	9813.00
b		Height 5m to 10m	cum	10222.00
c		Height above 10m	cum	10631.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	10222.00
b		Height 5m to 10m	cum	10631.00
c		Height above 10m	cum	11040.00
C		**RCC Grade M 30**		
Case I		**Using Concrete Mixer**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8936.00
b		Height 5m to 10m	cum	9308.00
c		Height above 10m	cum	9681.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	9308.00
b		Height 5m to 10m	cum	9681.00
c		Height above 10m	cum	10053.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump.**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	9907.00
b		Height 5m to 10m	cum	10319.00
c		Height above 10m	cum	10732.00
(ii)		**For T-beam & slab**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
a		Height upto 5m	cum	10319.00
b		Height 5m to 10m	cum	10732.00
c		Height above 10m	cum	11145.00
D		**RCC/PSC Grade M35**		
Case 1		**Using concrete mixer.**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	8971.00
b		Height 5m to 10m	cum	9351.00
c		Height above 10m	cum	9732.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	9351.00
b		Height 5m to 10m	cum	9732.00
c		Height above 10m	cum	10112.00
(iii)		**For box girder and balanced cantilever**		
a		Height upto 5m	cum	10492.00
b		Height 5m to 10m	cum	11252.00
c		Height above 10m	cum	12012.00
Case II		**Using Batching Plant, Transit Mixer and Concrete Pump**		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	9920.00
b		Height 5m to 10m	cum	10340.00
c		Height above 10m	cum	10761.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	10340.00
b		Height 5m to 10m	cum	10761.00
c		Height above 10m	cum	11181.00
(iii)		**For box girder and balanced cantilever**		
a		Height upto 5m	cum	11601.00
b		Height 5m to 10m	cum	12442.00
c		Height above 10m	cum	13283.00
E		**PSC Grade M-40**		
Case 1		Using concrete mixer.		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	9274.00
b		Height 5m to 10m	cum	9661.00
c		Height above 10m	cum	10047.00
(ii)		**For T-beam & slab**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
a		Height upto 5m	cum	9661.00
b		Height 5m to 10m	cum	10047.00
c		Height above 10m	cum	10434.00
Case II		Using Batching Plant, Transit Mixer and Concrete Pump		
(i)		**For solid slab super-structure**		
a		Height upto 5m	cum	10023.00
b		Height 5m to 10m	cum	10447.00
c		Height above 10m	cum	10872.00
(ii)		**For T-beam & slab**		
a		Height upto 5m	cum	10447.00
b		Height 5m to 10m	cum	10872.00
c		Height above 10m	cum	11297.00
(iii)		**For box girder and balanced cantilever**		
a		Height upto 5m	cum	11721.00
b		Height 5m to 10m	cum	12571.00
c		Height above 10m	cum	13420.00
F		**PSC Grade M-45**		
(i)		**For solid slab/voided slab super-structure**		
a		Height upto 5m	cum	10266.00
b		Height 5m to 10m	cum	10709.00
c		Height above 10m	cum	11151.00
(ii)		**For I-beam & slab including launching of precast girders by launching truss upto 40 m span**		
a		Height upto 5m	cum	10709.00
b		Height 5m to 10m	cum	11151.00
c		Height above 10m	cum	11594.00
(iii)		**For cast-in-situ box girder, segmental construction and balanced cantilever**		
a		Height upto 5m	cum	12036.00
b		Height 5m to 10m	cum	12921.00
c		Height above 10m	cum	13806.00
G		**PSC Grade M-50**		
(i)		**For cast-in-situ box girder, segmental construction and balanced cantilever**		
a		Height upto 5m	cum	12291.00
b		Height 5m to 10m	cum	13202.00
c		Height above 10m	cum	14112.00
H		**PSC Grade M- 55**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
(i)		**For cast-in-situ box girder, segmental construction and balanced cantilever**		
a		Height upto 5m	cum	12830.00
b		Height 5m to 10m	cum	13780.00
c		Height above 10m	cum	14730.00
17.59		Reinforcement in Super Structure: Supplying, fitting and placing TMT conforming to IS:1786 Fe 500 D reinforcement in super-structure including splicing complete as per drawing and technical specifications		
(a)		TMT-IS 1786 (Fe-500 D) Primary Producer (TATA/ SAIL/ Esser Steel/ Jindal panther steel/ Shyam steel or equivalent)	tonne	62506.00
17.60		High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	111434.00
17.61		Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	11822.00
17.62		**Mastic Asphalt Wearing Course:** Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, 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.	sqm	406.00
17.63		**Bituminous wearing course:** 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	503.00
17.64		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	1798.00
17.65		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	1757.00
17.66		Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification	metre	4109.00
17.67		Drainage Spouts complete as per drawing and Technical specification	Each	8031.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.68		PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	5274.00
17.69		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 (TATA/ SAIL/ Esser Steel/ Jindal panther steel/ Shyam steel or equivalent)	cum	11165.00
(b)		TMT-IS 1786 (Fe-500 D) Secondary Producer (ISI approved)	cum	11045.00
(c)		MS bar-IS 1786 (Fe-250) Secondary Producer	cum	11045.00
17.70		**Structural steel Built-Up-Girder (BUG)** (Providing and launching Steel Truss of Structural steel BUG Super Structure including painting complete as per as per drawing and technical specifications under Section 1900 of MOST.)	MT	123302.00
17.71		**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	50.00
(B)		**For RCC Railing**	RM	177.00
17.72		**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	1374.00
17.73		**Filler joint**		
(i)		Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.	metre	3944.00
(ii)		Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.	metre	333.00
(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	302.00
(iv)		Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight	metre	23.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
17.74		**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	1174.00
17.75		**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	24189.00
17.76		**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	12689.00
17.77		**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	25451.00
17.78		**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	137986.00
17.79		**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 to the manufacturer's instruction for installation.)	metre	209145.00
17.80		**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	333.00
17.81		**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	229.00

PART-E: NEW TECHNOLOGY

Chapter-18

New Technology

Preamble

1 This Chapter includes various innovative new Technology items, which are not covered by MORD specification for Rural Road 2004.

2 As per latest revised version of MoRD specification for rural RoadsSpecific importance to some new items alongwith few new technologies like Bio-Enzyme, Roadstab, Zycosil Nano Technology, Evocrete Technology, Cell Fill Concrete, Tenax 3D Grid Technology, Cold milling etc. has been included in this edition.

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
		CHAPTER-18		
		NEW TECHNOLOGY		
18.1		**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	168.00
18.2		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	34.00
18.3		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	3105.00
18.4		**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 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%.	cum	1436.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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	1632.00
18.5		**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	3662.00
18.6		**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 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	4423.00
B		**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. Various combinations of Aggregates, Stone Dust Insitu Soil and RBI grade 81 percentages have been given. The optimum combination would depend upon the (1) In Situ Soil CBR and PI. (2) Traffic Catagory. (3) Distance of Quarry from Site For further increasing the durability of the road, out of the combinitations as bellow the combination with higher		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	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	4500.00
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 (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	4423.00
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	4293.00
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	4216.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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 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	cum	4086.00
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	4009.00
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 item in ASSAM SOR 2017-18 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 directions	cum	2687.00
C		**For Selected Soil Having CBR 7% to 9%**		
		RBI GRADE-81 - 4%		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
		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 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 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	4543.00
II		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 % 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	4385.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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	4336.00
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 all cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions	cum	4178.00
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	4129.00
		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	3970.00
		RBI GRADE-81 - 2%		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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 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	2649.00
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	4679.00
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	4473.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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	4266.00
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	2945.00
18.7		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/Subgrade. Including basic cost of materials, labour, HOM of machinery, etc complete as per specifications and EIC directions.	cum	2464.00
18.8		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	2819.00
18.9		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	1904.00
18.10		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	2258.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
18.11		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	1904.00
18.12		**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 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.	sqm	15.00
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	cum	2234.00
III		Prime Coat (with silane Nanotechnology)		
(i)		Low porosity		
		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, hire Charges of machery etc. complete as per MoRD specifications & direction of Engineer-in-Charge.	sqm	21.00

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
18.13		**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	128.00
18.14		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	48.00
18.15		**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**)**		
I		20.0cm thick Sub-Base & Base with Evocrete and Cement etc.	cum	3118.00
18.16		**Cell Filled Concrete Pavement**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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		
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 20 Female workers 7 Mason 4 1 number concrete mixer Plate 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	864.00
18.17		**TENAX 3D GRID TECHNOLOGY**		
I		Supplying and laying of Polypropylene extruded Geogrid with a minimum stiffness (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	sqm	148.00
18.18		**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	6161.00
18.19		**Protective coatings to the structures, equipments and machine parts with performance guarantee for 3 years.**		

Item No.	Ref. of MoSRT&H	Descriptions	Unit	Rate
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
18.20		**WASTE PLASTIC TECHNOLOGY**		
I		Semi dense bituminous concrete using Bituminous Binder mixing with processed waste plastice (as per IRC-SP;98-20130 by replacement of 8% Bitumen binder by weight. 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 @ 4.6 per cent of mix and filler, (ic 92% of standard Bitumen and 8% waste proccessed plastice by weight shall be used for coating aggregate after its heating) as per IRC:SP:98-2013) for grading II.	cum	6952.70
II		20mm thick open-Graded Premix carpet using Bituminous Binder mixing with processed waste plastice (as per IRC-SP;98-20130 by replacement of 8% Bitumen binder by weight: Providing laying and rolling of 20mm thick open - graded premix carpet (thickness not less than 20mm at any place) composed of 13.2mm graded aggregate size @0.18cum per 10sqm & 11.2mm graded aggregate size @ 0.09cum per 10sqm using with bituminous binder @13.43kg per 10sqm (ic 92% of standard Bitumen and 8% waste proccessed plastice by weight shall be used for coating aggregate after its heating) as per IRC:SP:98-2013, laying to required line, grade and level to serve as wearing in a suitable plant , laying and rolling with a three wheel 80-100KN static roller capacity, finished to required level and grades as per technical specification clause 508 to be followed by seal coat of either Type-A,Type-B or Type-C as per technical specification.	sqm	150.90