संचालनालय, नगरीय प्रशासन एवं विकास, म.प्र., भोपाल
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क्रमांक / यां.प्र. / 07 / 2025 / 11642 भोपाल, दिनांक 08 / 10 / 2025

प्रति,

1. परियोजना निदेशक,
म.प्र. जल निगम मर्यादित,
भोपाल, म.प्र.।
2. प्रमुख अभियंता,
म.प्र. अर्बन डेवलपमेंट कंपनी लिमिटेड,
भोपाल, म.प्र.।
3. प्रमुख अभियंता,
लोक निर्माण विभाग
भोपाल, म.प्र.।
4. प्रमुख अभियंता,
म.प्र. ग्रामीण सड़क विकास,
भोपाल, म.प्र.।
5. प्रमुख अभियंता,
ग्रामीण यांत्रिकी सेवा,
भोपाल, म.प्र.।

विषयः–विभागीय ISSR के पुनरीक्षण के संबंध में।

––00––

विषयांतर्गत संचालनालय, नगरीय प्रशासन एवं विकास द्वारा विभागीय ISSR का पुनरीक्षण किया जा रहा है।

विभाग अंतर्गत SOR में नये आयटम जोड़ने / संशोधन का कार्य किया जा रहा है। संशोधन हेतु विभाग की ओर से Vol.-I : Road and Bridges का एक ड्राफ्ट तैयार किया गया है। इस ड्राफ्ट संशोधन में किसी सुधार की आवश्यकता है तो कृपया अपना सुझाव अथवा अभिमत दिनांक 17.10.2025 तक प्रेषित करने का कष्ट करें।

(प्रदीप एस. मिश्रा)
प्रमुख अभियंता
नगरीय प्रशासन एवं विकास
मध्यप्रदेश, भोपाल

पृ.क्रमांक / यां.प्र. / 07 / 2025 / 11643 भोपाल, दिनांक 08 / 10 / 2025

प्रतिलिपिः–

1. आयुक्त, संचालनालय, नगरीय प्रशासन एवं विकास की ओर सूचनार्थ।
2. समस्त आयुक्त, नगर पालिक निगम की ओर सूचनार्थ।
3. समस्त मुख्य नगरपालिका अधिकारी, नगर पालिका परिषद / नगर परिषद की ओर सूचनार्थ।
4. समस्त संभागीय अधीक्षण यंत्री / कार्यपालन यंत्री, नगरीय प्रशासन एवं विकास की ओर सूचनार्थ।

प्रमुख अभियंता
नगरीय प्रशासन एवं विकास
मध्यप्रदेश, भोपाल

GOVERNMENT OF MADHYA PRADESH

URBAN DEVELOPMENT & HOUSING DEPARTMENT

INTEGRATED STANDARD SCHEDULE OF RATES

[VOLUME - I]

ROAD & BRIDGE WORKS – 2025-26

DIRECTORATE OF
URBAN ADMINISTRATION AND DEVELOPMENT

PALIKA BHAWAN, SHIVAJI NAGAR, NEAR 6 No. STOP
BHOPAL, MADHYA PRADESH - 462016

TABLE OF CONTENTS

INTEGRATED STANDARD SCHEDULE OF RATES (ISSR)

COMMON GENERAL NOTES

This Integrated Standard Schedule of Rates (ISSR) of the Urban Administration & Development, Government of Madhya Pradesh (UADD) consists of the following four Volumes.

VOLUME - I	Road and Bridge Works
VOLUME - II	Building Works
VOLUME - III	Water Supply and Sewerage Works
VOLUME - IV	Electrical Works
VOLUME - V	Horticulture, Landscaping and Green Items

The following are the brief details about common approach and general conditions for this ISSR:

1. Interpretations:

The Engineer-in-Chief (E in C), Urban Administration & Development, Government of Madhya Pradesh (UADD) shall be the sole deciding authority as to the meaning, interpretation and implications for various provisions in this publication. The decision of E in C shall be final and binding.

Wherever any reference is made to any Indian Standard, or any other specification, it shall be taken as reference to the latest edition with all amendments issued thereto. In the event of any variation between the specifications (adopted) and the Indian Standard, the former shall take precedence over the latter.

2. Rates for completing the Items:

Unless specified otherwise, unit rates for various items of works are for completing the works as per specifications including full compensation for all operations and inclusive of all labour, materials, royalties, lease rent, wastage, temporary work, plant, equipment overhead charges and profit.

Rates include provisions for necessary watch and ward of the site and material, all items required for security and safety of workmen, material and the site including traffic control, provision of caution boards, red lights, watchmen flags and all necessary equipment for safety of workmen.

3. Specifications and Description of Items:

The Specifications have been mentioned in the General Notes of the Sections of each Chapter of this ISSR. The description of items is given briefly and linked with the relevant Specifications and these specifications may be referred to for detailed description, provisions and interpretations.

4. Definitions:

The following terms and expressions in the ISSR shall have the meaning or implication hereby assigned to them unless otherwise specified elsewhere.

4.1. “Section” shall mean Section of the Specifications.

4.2. "Table" would refer to the table of the aforesaid specifications.

4.3. Department: "Department" shall mean Urban Administration & Development, Government of Madhya Pradesh (UADD)

4.4. Contractor: The Contractor shall mean “Contractor” as defined in the contract.

4.5. Engineer-in-Charge: The "Engineer-in Charge" shall mean the "Engineer-in Charge" or “Engineer” as defined in the contract.

4.6. Superintending Engineer shall mean officer as designated by UADD.

4.7. Chief Engineer shall mean officer as designated by UADD.

4.8. Engineer-in-chief shall mean officer as designated by UADD.

4.9. Site: "The site" shall mean the land/or other places on, in, into or through which the work is to be executed under the contract or any adjacent land, path or street through which the work is to be executed under the contract, or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.

5. Use of Machinery:

The ISSR is based on the assumption that the urban infrastructure in the state is being constructed with appropriate use of machinery and equipment’s that are required to achieve the quality of work as prescribed in the specifications.

6. Working Conditions:

Rates have been analysed for average working conditions prevailing in the State. Average achievable outputs of machines and labour have been considered taking into account the job and management factors.

7. Overheads:

The overheads are considered as 5 percent for all items of works, which is assumed to include, inter alia, the following elements:

i. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.

ii. Expenditure on office establishment of the contractor, supervision and quality control, watch and ward etc.

iii. Mobilization /demobilization of resources.

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

v. Light vehicles for site supervision including administrative and managerial requirements.

vi. 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.

vii. Minor T& P including needle vibrators required for concrete work.

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

ix. Taking of trial pits and bore holes, where required as per the MORD Specifications.

x. Arrangement for traffic and traffic management during construction.

xi. Expenditure on safeguarding environment during construction.

xii. Sundries.

xiii. Financing expenditure of the Contractor.

xiv. Work insurance/compensation.

8. Contractor's Profit:

Contractor's profit is considered at the rate of 10 percent uniformly and is added on Overheads also.

9. Measurements:

Mode of measurements shall be as per provisions contained in the relevant Section of the specifications, unless specified otherwise.

9.1. The order of dimensions shall be consistent and in the sequence of length, width and height or depth or thickness.

9.2. Rounding off: Rounding off where required shall be done in accordance with IS: 2-1960. The number of significant places rounded in the rounded off value should be as specified.

9.3. Detailed measurements for steel and concrete for items of RCC approach slab, RCC Railing and RCC wearing coat shall also be recorded in M.B. However, the payment shall be regulated as per the item and rates given in the ISSR.

The measurements of rock excavation are to be done as per the relevant clause of "Specification"

10. Field Laboratories:

The work covers the provision and maintenance of an adequately equipped field laboratory as required for site control on the quality of materials and the works. The Contractor shall arrange to provide fully furnished and adequately equipped field laboratory. Services of appropriate number of qualified lab assistant, material engineer shall also be ensured. The field laboratory shall preferably be located adjacent to the site office of the Engineer and provided with amenities like water supply, electric supply etc. as approved by the Engineer-in-Charge.

11. General:

11.1. Various Sections of all the Volumes and all the Chapters have been provided with General conditions and notes. These conditions and notes shall govern the items of work covered under relevant Section and chapter.

11.2. Quality control of works shall be governed by the relevant Specifications.

11.3. Samples of all materials to be used on the work shall be got approved by the contractor from the Engineer-in-Charge well in time. The approved samples duly authenticated and sealed shall be kept in the custody of the Engineer-in-Charge till the completion of the work. All materials to be provided by the contractor shall be fresh and as per sample approved by Engineer-in-Charge.

11.4. Materials obtained by the contractor from the sources approved by the Department shall be subjected to the mandatory tests. Where such materials do not conform to the relevant specifications, the matter shall be taken up by the Engineer-in-Charge for appropriate action against the defaulters. In all such cases, necessary documents in original and proof of payment relating to the procurement of materials shall be made available by the contractor to the Engineer-in-Charge.

11.5. Samples, whether submitted for approval to govern bulk supplies or required for testing before use and also the sample of materials bearing 'Standard mark if required for testing, shall be provided free of cost by the contractor. All other incidental expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. shall be borne by the contractor.

11.6. Materials stored at site, depending upon the individual characteristics, shall be protected from atmospheric effects due to rain, sun, wind and moisture to avoid deterioration.

11.7. It will not be obligatory on the part of engineer-in-charge to provide any assistance in obtaining lease/permits for excavation of minor minerals.

LIST OF UNITS

S No.	Units	Abbreviation Symbol
1	Length (Running Meter)	RM
2	Area (Square Meter)	Sqm
3	Volume (Cubic Meter)	Cum
4	Volume (Cubic Centimetre)	Cucm
5	Volume (Litre)	Ltr
6	Volume Kilolitre	Kl
7	Weight (Metric Tonne)	MT
8	Weight in Grams	Gms
9	Weight Kilogram	Kg
10	Kilo Newton	kN
11	Kilometre	Km
12	Quantity (Numbers)	Each/No
13	Quantity (Lump Sum)	LS
14	Time (Hour)	Hr
15	Temperature	O ^{c}

LIST OF ABBREVIATIONS

Abbreviation	Full Form
AASHTO	American Association of State Highway and Transportation Officials
AC	Asbestos Cement
AE	Assistant Engineer
BOQ	Bill of Quantities
CBR	California Bearing Ratio
CC	Cement Concrete
CE	Chief Engineer
CI	Cast Iron
CPHEEO	Central Public Health and Environmental Engineering Organization
CPWD	Central Public Works Department
CRMB	Crumb Rubber Modified Bitumen
CRRI	Central Road Research Institute
Dia.	Diameter
DLC	Dry Lean Concrete
E in C	Engineer in Chief
EE	Executive Engineer
GI	Galvanised Iron
HYSD	High Yield Strength Deformed Bars
IRC	Indian Road Congress
IS	Indian Standard Published by the Bureau of Indian Standards
Max	Maximum
MDD	Maximum Dry Density
Min	Minimum
MoRTH	Ministry of Road Transport and Highways, Government of India
MS	Mild Steel
O^c	Degree Centigrade
OMC	Optimum Moisture Content
PCC	Plain Cement Concrete
PMB	Polymer Modified Bitumen

PQC	Pavement Quality Concrete
PSC	Prestressed Concrete
RE	Reinforced Earth
RCC	Reinforced Cement Concrete
S/E	Sub-Engineer
SE	Superintending Engineer
SW	Stoneware
UADD	Directorate of Urban Administration and Development, Government of Madhya Pradesh
UCS	Unconfined Compressive Strength
VG	Viscosity Grade
WBM	Water Bound Macadam
WC	Water Cement
WMM	Wet Mix Macadam

INTEGRATED STANDARD SCHEDULE OF RATES

GENERAL NOTES

VOLUME-1

ROAD AND BRIDGE WORKS

1. Specifications:

Unless specified otherwise "Specifications" shall mean "Specifications for Road and Bridge works" (5th Revision) published by the Indian Roads Congress April 2013, on behalf of the Government of India, Ministry of Road Transport & Highway (Roads Wing) and other relevant publications.

2. Rates:

The rates include all such activities that are described in Specifications unless specified otherwise. All expenses pertaining to quality control tests are also part of the rates and the contractor shall not be entitled for any extra remuneration in this regard. Rates also include provisions of necessary precautionary devices and other arrangements etc. for traffic control, e.g. provision of caution boards, red lights, watchmen flags and flagmen but do not include construction of temporary diversion.

CHAPTER- 1

CARRIAGE OF MATERIAL

Notes:

1. The items of this Chapter shall be governed by provisions of materials in various Chapters of Specifications.
2. In case of supply of materials or carriage of materials involved in any items of work in this ISSR, unless specified otherwise, if carriage of any material is not covered in the item of work, carriage of material shall be calculated and paid as per provisions of this Chapter.

CHAPTER - 01
CARRIAGE OF MATERIAL

1.0 Transportation by Mechanical means including loading, unloading and stacking

S No.	Material	Per Trip	Payable	Unit		Rate (Rs.)							
					Over	1km	2km	3km	4km	5km	Beyond 5 km upto 10 km (Per Km)	Beyond 10 km upto 20 km (Per Km)	Beyond 20 km upto 50 km (Per Km)
1.1	Excavated Earth	8	6.4	cum	0.15	92.87	107.35	121.62	135.42	148.81	12.32	10.49	8.31
1.2	Excavated rock	8	4	cum	0.15	148.59	171.76	194.59	216.68	238.09	19.71	16.78	13.29
1.3	Sand, stone aggregate below 40 mm	8	8	cum	0.15	74.30	85.88	97.29	108.34	119.04	9.86	8.39	6.64
1.4	Stone aggregate 40 mm and above	8	7.36	cum	0.15	80.76	93.35	105.75	117.76	129.40	10.71	9.12	7.22
1.5	Boulder	8	6.8	cum	0.15	87.41	101.03	114.46	127.46	140.05	11.60	9.87	7.82
1.6	Lime, gravel, building, rubbish, Fly Ash	8	8	cum	0.15	74.30	85.88	97.29	108.34	119.04	9.86	8.39	6.64
1.7	Bricks	3000	3000	1000	0.15	198.12	229.01	259.45	280.11	307.79	25.49	21.69	17.18
1.8	Steel/G.I. sheet/ Pipes/Fuel wood/ Coal/ Cement/ Bitumen	9	9	tonne	0.15	66.04	76.34	86.48	96.30	105.82	8.76	7.46	5.91
1.9	Timber	7	7	cum	0.15	84.91	98.15	111.19	123.82	136.05	11.27	9.59	7.59
1.10	Manure or sludge	8	7.36	cum	0.15	80.76	93.35	105.75	117.76	129.40	10.71	9.12	7.22
1.1.9	Brick Tiles	5000	5000	1000	0.15	118.87	137.41	155.67	168.07	184.67	15.29	13.01	10.31
1.1.10	Cement, stone blocks, G.I. C.I., A.C., and C.C., pipes below 100mm dia and other heavy materials	9	9	tonne	0.15	66.04	76.34	86.48	96.30	105.82	8.76	7.46	5.91
1.1.13	Bitumen	8	8	tonne	0.15	74.30	85.88	97.29	108.34	119.04	9.86	8.39	6.64

CHAPTER - 01
CARRIAGE OF MATERIAL

1.0 Transportation by Mechanical means including loading, unloading and stacking

S No.	Material	Per Trip	Payable	Unit		Rate (Rs.)							
					Over	1km	2km	3km	4km	5km	Beyond 5 km upto 10 km (Per Km)	Beyond 10 km upto 20 km (Per Km)	Beyond 20 km upto 50 km (Per Km)
1.1.14	Coal	7	7	tonne	0.15	84.91	98.15	111.19	123.82	136.05	11.27	9.59	7.59
1.1.15	R.C.C. pipes, A.C. pipes, steel pipe, C.I. pipes & S.W. Pipes												
1.1.15.1	100 mm dia	366	366	100 m	0.15	162.39	187.71	212.66	236.80	260.21	21.55	18.34	14.52
1.1.15.2	125 mm dia	274	274	100 m	0.15	216.92	250.74	284.07	316.32	347.57	28.78	24.49	19.40
1.1.15.3	150 mm dia	219.6	219.6	100 m	0.15	270.66	312.85	354.44	394.67	433.68	35.91	30.56	24.21
1.1.15.4	200 mm dia	135	135	100 m	0.15	440.27	508.91	576.55	642.00	705.45	58.41	49.71	39.38
1.1.15.5	250 mm dia	95	95	100 m	0.15	625.64	723.19	819.31	912.32	1002.48	83.01	70.64	55.96
1.1.15.6	300 mm dia	76.86	76.86	100 m	0.15	773.31	893.87	1012.68	1127.64	1239.07	102.60	87.32	69.16
1.1.15.7	350 mm dia	54.9	54.9	100 m	0.15	1082.63	1251.42	1417.75	1578.70	1734.70	143.64	122.24	96.83
1.1.15.8	400 mm dia	40.26	40.26	100 m	0.15	1476.31	1706.48	1933.29	2152.77	2365.50	195.87	166.69	132.04
1.1.15.9	450 mm & 500 mm dia	32.94	32.94	100 m	0.15	1804.38	2085.70	2362.92	2631.17	2891.17	239.40	203.74	161.38
1.1.15.10	600, 700, 750 & 800 mm	21.96	21.96	100 m	0.15	2706.57	3128.55	3544.37	3946.75	4336.76	359.10	305.61	242.07
1.1.15.11	900 mm dia	14.64	14.64	100 m	0.15	4059.85	4692.82	5316.56	5920.12	6505.14	538.65	458.41	363.11
1.1.15.12	1000, 1100 & 1200 mm	10.98	10.98	100 m	0.15	5413.14	6257.09	7088.75	7893.50	8673.52	718.20	611.21	484.15
1.1.15.13	1600 to 1800 mm dia	8.75	8.78	100 m	0.15	6769.50	7824.93	8864.97	9871.36	10846.84	898.16	764.37	605.46
NOTE:	**The rates are inclusive of voids for different types of materials no further deduction shall be made for voids**												

CHAPTER- 2

SITE CLEARANCE AND DISMANTLING

Notes:

1. The items of this Chapter shall be governed by Section 200 of the Specifications.★
2. The work include cutting removing and disposing all material such as bushes, shrubs, stumps, roots, grass, weeds, top organic soil not exceeding 150 mm in thickness, rubbish etc. which in the opinion of the Engineer-in-Charge are unsuitable for the work.
3. The work includes necessary excavation back filling of pits resulting from uprooting of trees and stumps to required compaction, handling, salvaging, and disposal of cleared materials.
4. Before starting the work, contractor shall submit to the Engineer-in-Charge for approval his work plan including the procedure to be followed for disposal of waste material.
5. The contractor shall ensure that underground and overground existing public utility structures such as pipe line, sewers and cables etc shall be protected from damages during site clearance operation, if damages are caused to public utility structures, the contractor shall repair such structures at his own cost.
6. Material obtained by dismantling shall be stacked are disposed as per the direction of Engineer-in-Charge.

Schedule of Rates

Item No.	Sub Items No.	Description	Unit	Rate (In Rs.)
2.1		**Cutting of Trees**		
		Cutting of trees, including, branches and removal of cuttings of trees, including cutting of trunks/branches in suitable size removal of stumps/roots and stacking of serviceable material with all lifts and lead up to storage yard and filling earth in the depression and pits as per Section-200 of the specifications.		
	2.1.1	Girth from 300 mm to 600 mm	Each	350.00
	2.1.2	Girth beyond 600 mm to 900 mm	Each	554.00
	2.1.3	Girth beyond 900 mm to 1800 mm	Each	1175.00
	2.1.4	Girth above 1800 mm	Each	2351.00
2.2		**Clearing and Grubbing**		

Item No.	Sub Items No.	Description	Unit	Rate (In Rs.)
		Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees having girth up to 300 mm, removal of stumps of trees cut earlier, disposal of unserviceable materials and stacking of serviceable material up to a lead of 1000 Metres including removal and disposal of top organic soil not exceeding 150 mm in thickness, if required, as per Section-200 of the specifications.		
(i)		By manual means:		
	2.2.1	In area of light jungle	Hectare	111981.00
	2.2.2	In area of thorny jungle	Hectare	139937.00
2.3		**Dismantling of existing structures by manual means**		
		Dismantling of existing structures by manual means comprising of masonry, Cement Concrete, wood work, steel work, including TandP and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material, stacking the serviceable material with all lifts and lead up to 1000 Metre, as per Section-200 of the specifications.		
	2.3.1	**Concrete**		
	2.3.1.1	Lime Concrete, Cement Concrete grade M-10 and below	Cum	497.00
	2.3.1.2	Plain Cement Concrete Grade M-15 and M-20	Cum	609.00
	2.3.1.3	Prestressed/Reinforced Cement Concrete Grade M -20 and above	Cum	1765.00
	2.3.2	**Tile work/brick masonry**		
	2.3.2.1	In lime mortar	Cum	273.00
	2.3.2.2	In cement mortar	Cum	385.00
	2.3.2.3	In mud mortar	Cum	229.00
	2.3.2.4	Dry brick pitching or brick soling	Cum	206.00
	2.3.3	**Stone Masonry**		
	2.3.3.1	Rubble stone masonry in lime mortar	Cum	318.00
	2.3.3.2	Rubble stone masonry in cement mortar.	Cum	385.00
	2.3.3.3	Rubble Stone Masonry in mud mortar.	Cum	273.00
	2.3.3.4	Dry rubble masonry	Cum	251.00
	2.3.3.5	Dismantling stone pitching/dry stone spalls.	Cum	229.00
	2.3.3.6	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.	Cum	273.00

Item No.	Sub Items No.	Description	Unit	Rate (In Rs.)
	2.3.3.7	Steel work in all types of sections up to a height of 5 m above plinth level including cutting of rivet Including dismembering	Tonne	2242.00
	2.3.4	**Scraping of bricks dismantled from brick work including stacking.**		
	2.3.4.1	In lime/Cement mortar	1000 No.	1957.00
	2.3.4.2	In mud mortar	1000 No.	699.00
	2.3.5	**Scraping of stone from dismantled stone masonry**		
	2.3.5.1	In cement and lime mortar	Cum	785.00
	2.3.5.2	In mud mortar	Cum	167.00
	2.3.5.3	Scarping plaster in lime or cement mortar from brick/ stone masonry	Sqm	23.00
	2.3.6	**Removing all type of R.C.C. Hume pipes and stacking within a lead up to 1000 Metre including earthwork and dismantling of masonry works around pipes.**		
	2.3.6.1	Up to 600 mm dia.	Metre	290.00
	2.3.6.2	Above 600 mm to 900 mm dia.	Metre	393.00
	2.3.6.3	Above 900 mm dia.	Metre	672.00
2.4		**Dismantling of flexible pavements**		
		Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 Metre by manual means, stacking serviceable and unserviceable materials separately and Section-200 of the specifications.		
	2.4.1	Bituminous courses	Cum	706.00
	2.4.2	Granular courses	Cum	635.00
2.5		**Dismantling of Cement Concrete pavement**		
		Dismantling of Cement Concrete pavement including breaking to pieces not exceeding 0.02 Cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead up to 1000 Metre, stacking serviceable and unserviceable materials separately as per Section-200 of the specifications.	Cum	1238.00
2.6		**Dismantling Guard Rails**		
		Dismantling guard rails by manual means and disposal of dismantled material with all lifts and up to a lead up to 1000 Metre, stacking serviceable materials and unserviceable materials separately as per Section-200 of the specifications.	Metre	95.00

Item No.	Sub Items No.	Description	Unit	Rate (In Rs.)
2.7		**Dismantling Kerb Stone**		
		Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead up to 1000 Metre, stacking serviceable and unserviceable materials separately and as per Section-200 of the specifications.	Metre	13.00
2.8		**Dismantling of Barbed Wire**		
		Dismantling of barbed wire fencing/wire mesh fencing including posts (any type), foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and up to a lead of 1000 Metre, stacking serviceable material and unserviceable material separately.	Metre	76.00
2.9		**Dismantling of CI Water Pipe Line**		
		Dismantling of CI water pipe line up to 600 mm dia. including disposal with all lifts and lead up to 1000 Metre and stacking of serviceable material and unserviceable material separately.	Metre	210.00
2.10		**Removal of Cement Concrete Pipes**		
		Removal of Cement Concrete pipe of sewer gutter up to 1500 mm dia. under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 Metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works.	Metre	223.00
2.11		**Removal of Telephone/Electric Poles**		
		Removal of telephone/Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 Metres and stacking the serviceable and unserviceable material separately.	Each	248.00
2.12		**Dismantling of Kilometre Stones**		
		Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead up to 1000 m and back filling of pit.		
	2.12.1	5th Km Stone	Each	512.00
	2.12.2	Ordinary Km Stone	Each	303.00
	2.12.3	Hectometre Stone	Each	61.00
	2.12.4	Boundary Stone	Metre	66.00
2.13		**Dewatering**		

Item No.	Sub Items No.	Description	Unit	Rate (In Rs.)
		Dewatering of water caused by springs, tides or river seepage, broken water mains or drains or well or another similar situation.	Kilolitre	115.00
2.14		**Taking out Interlocking Paver Blocks**		
		Taking out existing CC interlocking paver blocks from footpath /central verge etc., including removal of rubbish etc., and stacking of serviceable material within 50 Metre lead as per direction of Engineer-in-Charge. (Payment shall be made separately for disposal of unserviceable material to the dumping ground)	Sqm	31.00

CHAPTER- 3

EARTH WORKS

Notes:

1. The items of this Chapter shall be governed by Section 300 of the Specifications.★
2. The limits of excavation shall be set out true to lines, curves, slopes, grades and sections as shown in the drawings of concerned work.
3. The classification of excavated material shall be as per Sub Section 301.2 of the Specifications.
4. The construction operations shall be as per Sub Section 301.3 of the Specifications.
5. Measurements for payment and rates shall be as per Section 301.8 and 301.9 of the Specifications respectively.
6. Precautions shall be taken to ensure protection and preservation of any or all existing roadside trees, drains, sewers or other sub-surface drains, pipes, conduits etc.
7. Blasting operations shall be as per Section 302 of the Specifications. Blasting shall be done only with the written permission of competent authority. Blasting hours shall be announced to the people in vicinity and red danger flag shall be displayed prominently in all direction during the blasting operation. The flag shall be planted 200 m from the blasting side in all directions.
8. Excavation for structure beyond the depth of 3 metre has been included in Chapter 12 of this ISSR.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
		Excavation by Manual Means		
3.1		Excavation for **roadway in soil** including loading and unloading in/from truck for carrying suitable cut earth to embankment site and disposing off unsuitable earth with all lifts and lead up to 1000 Metres as per Section-300 of the specifications.	Cum	244.00
3.2		**Ordinary Rock**		
		Excavation in **ordinary rock** including loading and unloading in/from in a truck and carrying of excavated material to embankment site with all lifts and leads up to 1000 Metres as per Section-300 of the specifications (by manual means)	Cum	361.00
		Excavation by Mechanical Means		
3.3		**Roadwork in Soil**		
		Excavation for **roadwork in soil** with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location with all lifts and lead up to 1000m as per Section-300 of the specifications.	Cum	122.00
3.4		**Roadway in Ordinary Rock**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
		Excavation for **roadway in ordinary rock** with hydraulic excavator including cutting and loading in tippers, transporting to embankment site with in all lifts and lead up to 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections as per Section-300 of the specifications.	Cum	195.00
3.5	**3.5.1**	**Excavation in Hard Rock (Blasting prohibited)**		
		Excavation for **roadwork in Hard Rock (Blasting prohibited)** with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes in accordance with requirements of lines, grades and cross Ss, and transporting to the embankment location within all lifts and lead up to 1000 m. *(50% quantity of hard rock obtained from excavation is assumed as usable quantity and the cost of which has been credited to the contractor in this item)*	Cum	645.00
	3.5.2	**Excavation in Hard Rock (Controlled Blasting)**		
		Excavation for **roadway in hard rock (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 road with all lifts and leads up to 1000 Metres and as per Section 300 of the specifications. *(50% quantity of hard rock obtained from excavation is assumed as usable quantity and the cost of which has been credited to the contractor in this item)*	Cum	593.00
3.6		**Marshy Soil**		
		Excavation for roadway in **marshy soil** with hydraulic excavator including cutting and loading in tippers and disposal with all lifts and lead up to 1000 Metres trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections as per Section-300 of the specifications.	Cum	191.00
3.7		**Granular Road Surface**		
		Scarifying the existing **granular road surface** to a depth of 50 mm and disposal of scarified material within all lifts and leads up to 1000 Metres. by mechanical means)	Sqm	8.00
3.8		**Bituminous Road Surface**		
		Scarifying the existing **bituminous road surface** by mechanical means to a depth of 50 mm and disposal of scarified material with in all lifts and lead up to 1000 Metres.	Sqm	9.00
3.9		**Excavation for Pipe/Cable laying**		
		Excavation for pipe laying (exceeding 30 cm in depth) including disposal of excavated earth with all lift and lead up to 50 m, disposed earth to be levelled and neatly dressed.		
	3.9.1	All kinds of soils	Cum	175.00
	3.9.2	Ordinary rock	Cum	232.00
	3.9.3	Hard rock (requiring blasting)	Cum	597.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
	3.9.4	Hard rock (blasting prohibited)	Cum	691.00
3.10		**Removal of Unserviceable Soil** with Disposal up to 1000 Metre: Removal of unserviceable soil including excavation, loading and disposal up to 1000 Metre lead but excluding replacement by suitable soil which shall be paid separately as per Section 305 of the specifications.	Cum	71.00
3.11		**Pre-splitting of Slopes**		
		Pre-splitting of Slopes of Rock Excavation: Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a dozer, loading in tipper by a front-end loader and disposing of the material with all lifts and lead up to 1000 m, as specified in Section 303 of the specifications.	Sqm	119.00
3.12		**Stripping and Storing Top Soil**		
		Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth.	Cum	66.00
3.13		**Construction of Embankment/Sub-grade/Earthen Shoulders**		
		Construction of Embankment/Sub-grade/Earthen Shoulders with material obtained from other sources, as per provisions of Section 305 of the specifications, with approved materials/soil confirming to requirements given in Table 301-1 of specifications including all lead and lifts including cost of watering, compaction by vibratory roller/heavy pneumatic type roller etc. confirming to requirements given in Table 301-2 of the specifications complete.	Cum	404.00
3.14		**Construction of Embankment with Material obtained from Borrow Pits**		
		Construction of **embankment** as per provisions of Section 305 with approved materials obtained from **borrow pits** confirming to requirements given in Table 301-1 of specifications with all lifts and lead up to 2500 m, including transportation to site, watering, compaction by vibratory roller/heavy pneumatic type roller etc. confirming to requirements given in Table 301-2 of specifications complete.	Cum	476.00
3.15		**Construction of Embankment with Material Deposited from Roadway Cutting**		
		Construction of **embankment** as per provisions of Section 305 with approved materials, confirming to requirements given in Table 301-1 of specifications, deposited at site from **roadway cutting and excavation from drain and foundation of other structures,** watering, compaction by vibratory roller/heavy pneumatic type roller etc. confirming to requirements given in Table 301-2 of specifications complete.	Cum	52.00
3.16		**Rock Fill Embankment**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
		Construction of **rock fill embankment** with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular material, rolled with vibratory road roller, all complete as per Section 313	Cum	125.00
3.17		**Compacting Original Ground supporting sub-grade**		
		Loosening of the ground up to a level of 500 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of Table 300.2 for sub-grade construction. *(This item is to be used only in cases where subgrade is being laid on old surfaces and will be executed with written permission of C.E.)*	Cum	74.00
		EARTHEN SURFACE DRAINS AND HUME PIPES		
3.18		Construction of unlined surface drains of average cross-sectional area 0.40 Sqm in soil to specified lines, grades, levels and dimensions to the requirement of Section 301 and 309. Suitable Excavated material to be used in embankment within a lead of 50 Metres as per Section-300.	Metre	105.00
3.19		Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/asbestos cement/cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450(w)x 550(d) mm. Suitable excavated material to be utilized in roadway at site	Metre	443.00
	Note: Items of Sub- Surface Drain with Geotextiles and Narrow Filter Sub- Surface Drain are available in Chapter 7 of this ISSR.			
		ENVIRONMENT FRIENDLY AND GREEN ITEMS		
3.20		**Stripping and Storing Top Soil for Plan Growth**		
		Stripping storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth.	Cum	66.00
3.21		**Construction of Embankment with Fly Ash**		
		Construction of embankment with **fly ash** conforming to table 1 of IRC: SP: 58 - 2001 obtained from coal or lignite burning thermal power stations as waste material, spreading with motor grader and compaction by vibratory roller in layer of 200mm thickness each at OMC, all as specified in IRC: SP: 58-2001 and Section 300 of the specifications.	Cum	380.00
		Note: The above rate is for an initial lead of fly ash up to 80 Kms. If the lead of the Fly ash is more than 80 Kms. the same shall be measured and paid extra as per item 1.6 of Chapter-1 "Carriage of Material".		
3.22		**Turfing with Sods**		
		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 specifications.	Sqm	31.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
3.23		**Seeding and Mulching**		
		Seeding and Mulching: Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per Sqm and laying and fixing jute netting, including watering for 3 months all as per Section 308 of the specifications.	Sqm	184.00
3.24		**Cement Concrete Hume pipes**		
	3.24.1	Providing and laying reinforced cement concrete Hume pipe NP-4 for service ducts below concrete pavement or other similar work, including fixing collar with cement mortar 1:2 excluding excavation bedding, protection works, backfilling, concrete and masonry work in head walls and parapets as per Section 2900 of the specifications.		
	3.24.1.1	300 mm dia	Metre	850.00
	3.24.1.2	600 mm dia	Metre	3100.00
	3.24.2	Providing and Laying Reinforced cement concrete Hume pipe NP4 for culverts including fixing collar with cement mortar 1:2 excluding excavation bedding, protection works, backfilling, concrete and masonry work in head walls and parapets as per Section 2900 of the specifications.		
	3.24.2.1	a. 1000 mm dia, in single row,	Metre	7500.00
		b. 1000 mm dia, in double row,	Metre	14052.00
	3.24.2.2	a. 1200 mm dia, in single row,	Metre	8553.00
		b. 1200 mm dia, in double row,	Metre	17280.00
	3.24.2.3	a. 1500 mm dia, in single row,	Metre	11094.00
		b. 1500 mm dia, in double row,	Metre	22362.00
	3.24.3	Providing and laying non-pressure NP3 class (Medium duty) cement concrete Hume pipes for service ducts below concrete pavement or other similar work, collar jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement: 2 fine sand).		
	3.24.3.1	Size 300 mm dia meter	RM	1921.00
	3.24.3.2	Size 450 mm dia meter	RM	2899.00
	3.24.3.3	Size 600 mm dia meter	RM	3471.00
	3.24.4	Providing and laying non-pressure NP2 class (light duty) cement concrete Hume pipes for service ducts below concrete pavement or other similar work, collar jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement: 2 fine sand).		
	3.24.4.1	Size 300 mm dia meter	RM	1679.00
	3.24.4.2	Size 450 mm dia meter	RM	2328.00
	3.24.4.3	Size 600 mm dia meter	RM	2374.00

CHAPTER- 4

NON-BITUMINOUS SUB BASES, BASES AND SHOULDERS

Notes:

1. The items of this Chapter shall be governed by Section 400 of the Specifications, unless specified otherwise.★

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
4.1		**Construction of Granular Sub-Base**		
		Construction of **granular sub-base**, spreading in uniform layers with motor grader on prepared surface, mixing **by Mix in Place Method** at OMC and compacting with vibratory roller of 80-100 KN Static weight to achieve the desired density, including all lifts and lead complete in all respect as per Section-400 of specifications.		
	4.1.1	**By Mix in Place Method**		
	4.1.1.1	Grading I	Cum	1085.00
	4.1.1.2	Grading II	Cum	1170.00
	4.1.1.3	Grading III	Cum	1152.00
	4.1.1.4	Grading IV	Cum	1157.00
	4.1.1.5	Grading V	Cum	1078.00
	4.1.1.6	Grading VI	Cum	1102.00
	4.1.2	Construction of granular sub-base by **Plant Mix Method including** mixing in a mechanical mixing plant at OMC, carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, including all lifts and lead complete as per Section 401 of specifications		
	4.1.2.1	Grading I	Cum	1387.00
	4.1.2.2	Grading II	Cum	1470.00
	4.1.2.3	Grading III	Cum	1454.00
	4.1.2.4	Grading IV	Cum	1459.00
	4.1.2.5	Grading V	Cum	1380.00
	4.1.2.6	Grading VI	Cum	1404.00
4.2		**Crusher Run Macadam Base**		
		Crusher Run Macadam Base - Providing crushed stone aggregate, depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a vibratory roller including all leads and lifts confirming to Section 407 of specifications to form a layer of Base.		
	4.2.1	**By Mix in Place Method**		
	4.2.1.1	For 53 mm maximum size	Cum	1207.00
	4.2.1.2	For 37.5 mm maximum size	Cum	1269.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
	4.2.2	**By Mixing Plant:**		
	4.2.2.1	For 53 mm maximum size	Cum	1319.00
	4.2.2.2	For 37.5 mm maximum size	Cum	1393.00
4.3		**Water Bound Macadam Sub-base and Base**		
		Water Bound Macadam Sub-base and Base: Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam including spreading in uniform thickness, hand packing (if required), rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding materials to fill up the interstices of coarse aggregate, watering and compacting to the required density and as per Section 404 of the specifications.		
	4.3.1	**Grading- I (63 to 45mm)**		
	4.3.1.1	Using Screening Type-A (13.2mm Agg.)	Cum	1169.00
	4.3.1.2	Using Screening Type-B (11.2mm Agg.)	Cum	1213.00
	4.3.2	**Grading- II (53 to 22.4mm)**		
	4.3.2.1	Using Screening Type-B (11.2mm Agg.)	Cum	1239.00
4.4		**Wet Mix Macadam Base (Plant mix method)**		
		Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam confirming to provisions of Section 406 of specifications including premixing the material with water at OMC in mechanical mix plant, carriage of mixed material by tipper to site, laying in uniform layers with paver in sub- base/base course on well-prepared surface and compacting with vibratory roller to achieve the desired density.	Cum	1199.00
	4.4.1	Deduction if paver is not used for spreading.	Cum	89.00
4.5		**Filling of Medians and Islands**		
		Filling of median and island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures or borrow pits, spread, graded and uncompacted as per Section-400 of the specifications.	Cum	241.00
4.6		**Hard Shoulders**		
		Construction of Hard Shoulder with approved material/selected soil having including excavation all lifts and leads including grading to required slope and camber of 4% and compacting using vibratory roller of 80 to 100 kN static weight to meet requirement as per Section of 400 of the specifications.	Cum	422.00
	4.6.1	Deduction for item No. 4.1 to 4.3 and 4.6 if vibratory roller / motor grader is not used.		
	4.6.1.1	If static roller is used in place of vibratory roller.	Cum	61.00
	4.6.2.2	If motor grader is not used.	Cum	61.00
4.7		**Inverted Choke**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
		Inverted Choke: Construction of inverted choke by providing, laying, spreading and compacting screening B type/ coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with power roller etc.	Cum	3610.00
4.8		**Making 50 mm wide Furrows**		
		Making 50 mm wide furrows, 450 mm to the centre line of the road and at one-Metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 Metres lead.		
	4.8.1	25 mm deep furrow cutting	Sqm	10.00
	4.8.2	50 mm deep furrow cutting	Sqm	12.00
4.9		**Construction of Median and Island with Soil taken from Roadway Cutting**		
	4.9.1	Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of structures, spread, graded and compacted as per Section 408 of the specifications.	Sqm	173.00
	4.9.2	Construction of Median and Island with soil taken from Borrow Areas construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per Section 408 of the specifications.	Cum	262.00
4.10		**Footpaths and Separators**		
		Construction of footpath/ separator by providing a 150 mm compacted granular sub base as per Section 410 of the specifications and 25-mm thick Cement Concrete Grade M15, over laid with precast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel.	Sqm	696.00
		ENVIRONMENT FRIENDLY ITEMS OF STABILISATION AND GREEN ITEMS		
4.11		**Lime Fly Ash Stabilised Sub-Base and Bases**		
		Construction of Sub-base using lime - fly ash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low plasticity clays having PI between 5 to 20 and liquid limit less than 25, 16% fly ash and 4% commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50%, fly ash to conform to gradation as per clause 4.3 of IRC: 88-1984, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5Kg/sq cm and 25% respectively, all as specified in IRC: 88 and as per Section-400 of the specifications.	Cum	784.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
		The above rate is for an initial lead of fly ash up to 25 Kms. If the lead of the Fly ash is more than 25 Kms. the same shall be measured and paid extra as per item 1.6 of Chapter 1 "Carriage of Material".		
		Cement Stabilized Sub Base and Bases.		
4.12		Providing, laying and spreading soil on a prepared sub-grade, pulverizing, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with vibrator roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base as per Section 403 of the specifications.	Cum	914.00
4.13		**Cement Treated Crushed Rock**		
		Cement Treated Crushed Rock or combination as per Section 403.2 and table 400.4 in 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 the motor grader and compacting with vibrator roller at OMC to achieve the desired unconfined compressive strength and to form a layer of Sub-base/Base as per Section 403 of the specifications.		
	4.13.1	**For Sub-Base course**		
		Plant Mix Method (Using by Mechanical Paver)	Cum	1442.00
	4.13.2	**For Base course**		
		Plant Mix Method (Using by Mechanical Paver)	Cum	1508.00
4.14		**Crushed Cement Concrete Sub-base/Base from C & D waste:**		
		Crushed Cement Concrete Sub-base/ Base, Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75mm as specified in table 400-9 transporting the aggregates obtained from breaking of Cement Concrete slabs at a lead of 1.0 km., laying and compacting the same as sub base/ base course, constructed as per Section 405 of the specifications.	Cum	295.00
4.15		**Full Depth Reclamation**		
		Stabilization of in-situ (existing pavement crust) or soil or otherwise sub base/ base course up to the required depth by cold in-situ recycling using chemical additives, otherwise: Providing pulverizing, spreading, milling and mixing of chemical additives at the appropriate rate as per job mix design in accordance with IRC: SP:72 and IRC-37, spreading cementitious additive at the rate of minimum 4-7% on the existing pavement using a mobile truck mounted containerized cement/additive spreader with microprocessor-controlled weighing and spreading system. The additive spreader shall have variable	Cum	3757.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs)
		working width sufficient to cover whole pavement lane. The in-situ stabilization process shall be carried out by a mobile and self-propelled stabilizer/reclaimer of working width of 2.4m with minimum engine horse power of 440 kw with a variable working depth up to 50 cm. the resultant stabilized mix then would be profiled to the required grade, level and thickness using motor grader and the mix would be compacted using 20 tone pad foot roller in combination with smooth wheel roller to achieve desired proctor density as per IRC 37-2018 and complete in all respect and curing with water as required including all materials, labour and machinery etc. The entire in-situ process would be carried out in single pass with milling and pulverizing of damaged asphalt pavement/ soil/aggregates/ soil-aggregate mixture to the desired depth and with simultaneous addition of additives and water with machine integrated spray bars fitted on the wheeled self-propelled and vibratory pad foot roller to achieve the required density.		

CHAPTER- 5

BITUMINOUS BASES AND SURFACE COURSES

Notes:

1. The items of this Chapter shall be governed by Section 500 of the Specifications.★

2. The General requirements for Bituminous pavement layer shall be as per Section 501 of the Specifications.

3. The Contractor shall ensure protection of environment during the construction operation of Bituminous pavement layers as per Annexure A to Sub Section 501 of the Specifications.

4. The rolling of Bituminous courses shall be done strictly as per provision of Section 501.6 of the Specifications. It should be ensured that road rollers, appropriate for achieving requisite density of the bituminous bases and surface course are deployed on the site. It should also be ensured that maximum laying and rolling temperatures of the bitumen mixes is as per the specifications.

5. While using Bitumen emulsions, special care has to be taken for ensuring the right quality of the emulsion. Packed emulsion should be used as it is in the bituminous coarse and no water shall be added separately.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
5.1		**Prime Coat**		
	5.1.1	Providing and applying Prime Coat with **Cationic Bitumen Emulsion (SS1 Garde)** on prepared surface of granular Base including cleaning of road surface and spraying primer at the rate of 0.70 to 1.00 Kg/Sqm using mechanical means as per Section 502 of the specifications.	Sqm	43.00
	5.1.2	Providing and applying primer coat with SS1 grade bitumen emulsion over stabilized soil base/crusher run macadam including clearing of road surface and spraying primer at the rate of 0.90 to 1.20 Kg/Sqm using mechanical means as per Section 502 of the specifications.	Sqm	56.00
		Tack Coat		
5.2		Providing and applying **Tack Coat** with cationic bitumen emulsion (RS-1) using emulsion pressure distributor on the prepared bituminous/granular surface cleaned with mechanical broom and as per Section 503 of the specifications.		
	5.2.1	@ 0.25 Kg per Sqm (normal bituminous surfaces)	Sqm	12.00
	5.2.2	@ 0.30 Kg per Sqm (dry and hungry bituminous surfaces/granular surfaces treated with primer)	Sqm	15.00
	5.2.3	@ 0.35 Kg per Sqm (Non-bituminous surfaces) Cement Concrete pavement.	Sqm	17.00
	5.2.4	@ 0.40 Kg per Sqm (Non-bituminous surfaces) granular base not primed.	Sqm	19.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
5.3		Providing and applying Tack Coat with low viscosity bitumen of VG 10 grade using bitumen pressure sprayer on the prepared bituminous/granular surface cleaned with mechanical broom and as per Section 503 of the specifications.		
	5.3.1	@ 0.25 Kg per Sqm (normal bituminous surfaces)	Sqm	17.00
	5.3.2	@ 0.30 Kg per Sqm (dry and hungry bituminous surfaces/granular surfaces treated with primer)	Sqm	20.00
	5.3.3	@ 0.35 Kg per Sqm (Non-bituminous surfaces) Cement Concrete pavement.	Sqm	23.00
	5.3.4	@ 0.40 Kg per Sqm (Non-bituminous surfaces) granular base not primed.	Sqm	26.00
		Surface Dressing		
5.4		Providing and laying **Surface Dressing** 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 and as per Section 509 of the specifications.		
	5.4.1	with 19 mm nominal chipping size and bitumen @1.2Kg per Sqm.	Sqm	93.00
	5.4.2	with 13 mm nominal chipping size and bitumen @ 1.0 Kg per Sqm.	Sqm	76.00
		Open Graded Pre-Mix Surfacing		
5.5		Providing, laying and rolling of **Open-Graded Premix Surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm** aggregates using Viscosity Grade Bitumen/Cationic 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 smooth wheeled roller 8-10 tonne capacity, finished to required level and grades excluding primer and Tack Coat and as per Section 510 of the specifications.		
	5.5.1	Mechanical method using VG 30 Grade Bitumen and Hot Mix Plant of appropriate capacity not less than75 tones/hour.	Sqm	159.00
	5.5.2	Open-Graded Premix Surfacing using cationic Bitumen Emulsion.	Sqm	105.00
5.6		Providing, laying and rolling of **Close-Graded Premix Surfacing/Mixed Seal Surfacing** material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-A) or 13.2 mm to 0.09 mm (Type-B) aggregates using paving bitumen to the 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 Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade and as per Section 508 of the specifications.		
	5.6.1	**VG-30 bitumen**		
		Type-A	Sqm	177.00
		Type-B	Sqm	165.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
	5.6.2	**CRMB-60**		
		Type-A	Sqm	177.00
		Type-B	Sqm	165.00
	5.6.3	**PMB-40**		
		Type-A	Sqm	185.00
		Type-B	Sqm	175.00
5.7		Providing and laying **Seal Coat** for sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats and as per Section 511 of the specifications with bitumen.		
	5.7.1	Type A: Liquid Seal Coat	Sqm	75.00
	5.7.2	Type B: Premixed Seal Coat with hot mix plant and paver finisher	Sqm	52.00
5.8		Providing and laying **Mastic Asphalt** wearing course with paving grade bitumen meeting the requirements given in table 500-39, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine-grained hard stone chipping of 13.2 mm nominal size at the rate of 0.005 Cum per 10 Sqm and at an approximate spacing of 10 cm centre to centre in both directions, pressed into surface when the temperature of surfaces not less than 100 degree Centigrade, protruding 1 mm to 4 mm over mastic surface complete in all respect and as per Section 516 of the specifications.		
	5.8.1	25 mm thick mastic	Sqm	785.00
	1. The rates for 50 mm and 40 mm thick layers may be worked out on pro-rata basis.			
	2. Where Tack Coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.			
	3. The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.			
	4. This rate analysis is based on design made by CRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.			
5.9		Providing and laying **Bituminous Macadam** with hot mix plant using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with mechanical paver finisher to the required grade, level and alignment and rolled as per Sections 501.6 and 501.7 to achieve the desired compaction complete in all respects and as per Section 504 of the specifications.		
	5.9.1	for Grading I (80-100mm thickness) bitumen content 3.3% (VG-30)	Cum	6527.00
	5.9.2	for Grading II (50-75mm thickness) bitumen content 3.4% (VG-30)	Cum	6678.00
5.10		Providing and laying **Levelling Course/Profile Corrective course** with bituminous macadam with hot mix plant using crushed aggregates of grading-1 premixed with bituminous	Cum	6290.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
		binder (VG-30) @ 3.1%, transported to site, laid over a previously prepared surface with mechanical paver finisher to the required grade, level and alignment and rolled as per Sections 501.6 and 501.7 to achieve the desired compaction complete in all respects and as per Section 500 of the specifications.		
5.11		Providing and laying **Dense Bituminous Macadam** with hot mix plant batch using crushed aggregates of specified grading, premixed with bituminous binder, transporting the hot mix to work site, laying with mechanical paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction complete in all respects and as per Section 505 of the specifications. (As specified, Lime or cement will be used as filler)		
	5.11.1	For Grading I (75-100mm thickness) bitumen content 4.0% (VG-30)	Cum	8141.00
	5.11.2	For Grading II (50-75mm thickness) bitumen content 4.5% (VG-30)	Cum	8872.00
5.12		Providing and laying **Bituminous Concrete** with hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder@ 5.2% of mix and filler, transporting the hot mix to work site, laying with mechanical paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects and as per Section 507 of the specifications.		
	5.12.1	For Grading I (50-65 mm thickness) with VG-30 bitumen	Cum	10140.00
	5.12.2	For Grading I (50-65 mm thickness) with CRMB-60	Cum	10147.00
	5.12.3	For Grading I (50-50 mm thickness) with PMB-40	Cum	10720.00
	5.12.4	For Grading II (30-45 mm thickness) with VG-30 bitumen	Cum	10484.00
	5.12.5	For Grading II (30-45 mm thickness) with CRMB-60	Cum	10522.00
	5.12.6	For Grading II (30-45 mm thickness) with PMB-40	Cum	11086.00
5.13		Providing and laying **Slurry Seal** consisting of a mixture of fine aggregates, Portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface and as per relevant Section 512 of the specifications.		
	5.13.1	1.5 mm thickness Type - I	Sqm	38.00
	5.13.2	3 mm thickness Type - II	Sqm	61.00
	5.13.3	5 mm thickness Type - III	Sqm	75.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
5.14		**Recycling of Bituminous Pavement** with Central Recycling Plant: Recycling pavement by cold milling of exiting bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30% of the required quantity, hauling and stock piling the reclaimed material near the central recycling plant after carrying out necessary checks and evaluation, adding fresh material including rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, all as specified in Section 519 of the specifications.	Cum	7840.00
5.15		Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing.	Sqm	36.00
5.16		**Bituminous Cold Mix** (Including Gravel Emulsion) Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and slow/medium setting bitumen emulsion including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels as per Section 518 of the specifications.		
	5.16.1	Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate	Cum	9873.00
	5.16.2	Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate	Cum	9935.00
5.17		**CRACK PREVENTION COURSES**		
	5.17.1	Providing and laying of a **Stress Absorbing Membrane** over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with Section 521 of the specifications, sprayed at the rate of 9 Kg per 10 Sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 Cum per 10 Sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to Section 517 of the specifications.	Sqm	67.00
	5.17.2	Providing and laying of a **Stress Absorbing Membrane** over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with Section 521, sprayed at the rate of 11 Kg per 10 Sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 Cum per 10 Sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to Section 517 of the specifications.	Sqm	81.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
	5.17.3	Providing and laying a single coat of a **Stress Absorbing Membrane** over a cracked road surface, with crack width above 9 mm and cracked area above 50 % after cleaning with a mechanical broom, using modified binder complying with Section 501.2.1, sprayed at the rate of 15 Kg per 10 Sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 Cum per 10 Sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to Section 517 of the specifications.	Sqm	108.00
5.18		**Recipe Cold Mix**: Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per Section 518.3 of the specifications.		
	5.18.1	75 mm thickness	Cum	6556.00
	5.18.2	40 mm thickness	Cum	9043.00
	5.18.3	25 mm thickness	Cum	10491.00
5.19		**Sand Asphalt Base Course**: Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub- grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity as per provisions of Section 506 of the specifications.	Cum	11801.00
5.20		**Pavement Milling of existing Bituminous surface** to a specified depth using Milling machine including disposal of removed material within all lifts and leads up to 5 km transporting, laying, compacting and finishing complete as per Section 506 of the specifications up to 100 mm.		
	5.20.1	up to 50 mm	Sqm	82.00
	5.20.2	51 to 100 mm	Sqm	101.00
5.21		**Providing and laying Micro Surfacing Course** as per IRC SP 81:2008 on existing structural sound and distressed pavement surface. (It is to be applied over an existing pavement surface which is structurally sound, but the surface is showing signs of premature ageing, aggregate loss, high degree of polishing, oxidation/hungry surface) comprising of aggregates confirming to Section 514 of the specifications. The Modified Bitumen Emulsion @ 10%, Filler cement @ 2%, Additive @ 0.5% and water as per requirement, aggregates as per Table 500-27 of the specifications. All these ingredients are mixed with required quantity of water to prepare semi fluid mass. The mix shall be spread mechanically using Micro Surfacing Paver. The Cost includes cleaning of surface with Air compressor, laying and compacting to provide even riding surface and shall be rolled by Pneumatic Tyre Roller and ensure excessive movement does not occur, including cost of all materials, labour, usage charges of machinery, lead, lifts, loading,		

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
		unloading, stacking, transporting, etc complete as per provisions of Section 514 of the specifications.		
	5.21.1	Type II grading (4 mm to 6 mm thickness)	Sqm	163.00
	5.21.2	Type III grading (6 mm to 8mm thickness)	Sqm	184.00
5.22		**Bituminous Concrete with Waste Plastic**		
	5.22.1	**Bituminous Concrete Grading-I with waste plastic modified Bitumen**: Providing and laying bituminous concrete with higher capacity batch type hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder @ 5.2 percent of mix using 8 percent waste plastic of Bituminous Binder and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per Section 507 of the specifications complete in all respects.	Cum	9848.00
	5.22.2	**Bituminous Concrete Grading - II with Waste Plastic Modified Bitumen:** Providing and laying bituminous concrete with higher capacity batch type hot mix plant using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 percent of mix using 8 per cent waste plastic of Bituminous Binder and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per Section No. 507 of the specifications complete in all respects.	Cum	9909.00

CHAPTER – 06

CEMENT CONCRETE PAVEMENT AND PAVING

Notes:

1. The items of this Chapter shall be governed by Section 600 of the Specifications. ★

2. The Cement Concrete in all the items of this chapter shall be prepared in batching and mixing plant with automatic controls. No manual mixed concrete shall be used.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
6.1		**Dry Lean Cement Concrete Sub- Base**		
		Construction of Dry Lean Cement Concrete Sub- Base Over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 26.5mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per Table 600-1 of the specifications, cement content not to be less than 150 Kg/Cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 MPa at 7 days, mixed in a batching plant, transported to site, laid with paver with electronic sensor/mechanical paver, compacting with 8-10 tonnes vibratory roller, finishing and curing and as per Section 601 of specifications.	Cum	3018.00
	6.1.1	Deduct from Item No 6.1 above if paver with electronic sensor/ mechanical paver, is not used and laying is done by any other method. *Note: The acceptance criteria regarding level, thickness, surface regularity, texture finish, strength of concrete and all other quality control measures shall be the same as in case of machine laid work. This item is to be executed with Prior written permission of Engineer-in-charge*	Cum	211.00
	6.1.2	Deduct from Item No 6.1 above if static roller is used in place of vibratory roller.	Cum	302.00
6.2		**Dowel jointed, Plain Cement Concrete Pavement**		
	6.2.1	**Construction of Dowel jointed, Plain Cement Concrete Pavement in M-30 Grade Concrete** over a prepared sub base with 43 or higher grade cement, coarse and fine aggregate conforming to IS:383 maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver with spreading the concrete by shovels, rakes compacted using needle, screed and plate vibrator and finished in a continuous operation including provision of contraction, expansion, and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, placing of dowel bar, tie rod admixtures as approved, curing compound, finishing to lines and grades as per approved drawings as per IRC-15 2011 and as per Section-602 of the specifications complete excluding cost of steel in dowel bar and tie rod etc.	Cum	5726.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
	6.2.2	**Construction of dowel jointed, plain Cement Concrete pavement in M-40 Grade Concrete** over a prepared sub base with 43 or higher grade cement, coarse and fine aggregate conforming to IS:383 maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver with electronic sensor, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, placing of dowel bar and tie rod, admixtures as approved, curing compound, finishing to lines and grades as per approved drawings as per IRC-15 2011 and as per Section-602 of the specifications complete but excluding cost of steel in dowel bar and tie rod etc.	Cum	5824.00
	6.2.3	Add extra for the cost of steel in dowel bar and tie bar etc. required as per design.		
	6.2.3.1	Mild Steel dowel bars confirming to IS 432, grade I	MT	63800.00
	6.2.3.2	HYSD tie bars of Fe 500 grade confirming to IS 1786	MT	63800.00
6.3		**Providing and Laying Cement Concrete Grade M-10** with 40 mm graded crushed stone aggregate, spreading the concrete by shovels mixing shall be in mechanical mixer, compacting by use of pin/plate/screed vibrators including form work by strong steel girders fixed by spikes.	Cum	4471.00
6.4		**Providing and Laying Cement Concrete Grade M-20** with 20 mm graded crushed stone aggregate, mixing shall be in mechanical mixer, laying with paver compacting by use of pin, plate / screed vibrators including form work by strong steel girders fixed by spikes, separation membrane 125 micron thick, including cutting of joints @ 4 to 5 m interval and filling it with hot applied bituminous sealant (without dowel bars) (max. thickness 20 cm).	Cum	5107.00
6.5		**Stone-Set Pavement:**		
		Providing and laying Stone-Set Pavement including preparation of 100mm thick compacted Granular Sub-base as per Section 401 and base 75mm thick compacted water bound macadam grading 2 as per Section 404. The stone set pavement shall consist of 150mm thick hammer dressed stones in the herring one or stretched bond pattern, on the bedding sand of 40mm over the WBM base bounded by edge stone using suitable compacting device. The gaps are to be filled with sand / stone dust.	Sqm	775.00
6.6		**Roller Compacted Cement Concrete Base:**		
		Construction of rolled cement concrete base course as per IRC SP 68 with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum, aggregate cement ratio not to exceed 15:1 and minimum cement content of 200 Kg/Cum, aggregate gradation to be as per table 600-3 of the specifications after blending, mixing in batching plant at	Cum	3298.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
		optimum moisture content, transporting to site, laying with a paver with electronic sensor, compacting with 8-10 tonnes smooth wheeled vibratory roller to achieve, the designed flexural strength, finishing and curing complete.		
6.7		**Coloured Chamfered Edge Cement Concrete Paver Blocks:**		
		Providing and laying factory made Coloured Chamfered Edge Cement Concrete Paver Blocks of required strength, thickness and size/shape, made by table vibratory method using PU mould, laid in required colour and pattern over 50mm thick compacted bed of stone dust, compacting and proper embedding/laying of inter locking paver blocks into the bedding layer through vibratory compaction by using plate vibrator, filling the joints with sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand including locking edges with M 15 Cement Concrete in footpath, light traffic parking etc. complete as per direction of Engineer-in-Charge.		
	6.7.1	100mm thick C.C. paver block of M-35 grade with approved colour, design and pattern.	Sqm	880.00
	6.7.2	80mm thick C.C. paver block of M-35 grade with approved colour, design and pattern.	Sqm	800.00
6.8		**Construction of Lean Concrete - Fly ash Base/Sub-bases:**		
		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 8-10 tonnes capacity within the time limit laid down vide clause 7.6.3 of IRC: 74-, construction joints properly formed at the end of day's work, cured for 14 days, all as specified in IRC: 74- and as per approved plans and process as per Section 601 of the specifications.	Cum	2723.00
6.9		**Cement - Fly Ash Concrete Pavement:**		
		Construction of Cement - Fly Ash Concrete Pavement with reinforced, dowel jointed, plain Cement Concrete pavement over a prepared sub base with 43 grade cement, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 15% and sand by 10%, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing and process as per Section 602 of the specifications.	Cum	5616.00
6.10		**Steel Fiber Reinforced Concrete Pavement:**		

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
		Supplying and providing continuously deformed **Steel Fiber Reinforcement** in RCC for pavement, heavy duty roads and in parking areas, undulating steel fibres with aspect ratio between 50 to 80 (dia. between 0.45 to 1 mm and length between 12.5 to 60 mm) manufactured from cold drawn wire and having a minimum tensile strength of 1100N/Sq mm, as per CE Certification label mark, non-glued/glued, non-balling, conforming to ASTM A 820/A 820 M-06, compatible with all construction chemicals used for the batching, laying and curing of concrete. The fibres shall be added to the concrete at specified dosage and shall be mixed with concrete for sufficient time to ensure uniform distribution and pumping of concrete. Addition of steel fibres in cement concrete supported slab/underground structure/precast items (like drains, manhole covers, walls, paver blocks, pipes, tunnel segments) etc. dose as per approved designs and directions of Engineer-in-Charge. Dose of Steel shall be as per IRC SP: 46-2013 updated Amendment.	Kg	98.00
6.11		**Supplying and providing Glass fibres chopped strands** of 12mm length at 900 grams per/Cum for mixing in RCC work to gain benefit of anti-cracking. Glass Fibers conform to properties as per ASTM c1666@-M-08 Density:2.68 +0.3g/m3 Tensile strength: 1-1.7 MPA Filament Dia.Metre:31x10-118x10 inch AR Value: As per EN 14649 Dose of Fiber shall be as per IRC SP: 46-2013 updated Amendment.	Kg	270.00
6.12		**White topping on Cement Concrete pavement**		
		Cement Concrete M-40 grade for White topping on Cement Concrete pavement: Providing and laying Conventional white Topping as per IRC: SP:76-2015 including polymeric synthetic fibre as per ASTM (1116) such as polyester/polyethylene/ polypropylene / Glass fibre at 9.25 Kg/Cum with groove cutting grid 1m x 1m to a depth of 1/3 of the thickness and of width of 3-5 mm with sealing joint as per design including cost of all material over bituminous surface (Existing bituminous surface prepared if necessary, either by milling or levelling course to be done with BM/DBM/DLC to correct surface profile and to be paid separately) as Cement Concrete Pavement, Construction. of unreinforced, Dowel Jointed, plain Cement Concrete pavement M-40 grade concrete over a prepared sub base, coarse and fine aggregate conforming to IS 383. Maximum size of coarse aggregate not exceeding 31.5 mm, mixed in a batching and mixing plant as per approved mix design, transported to the site, laid with a slip form paver, spread, compacted and finished in a continuous operation including provision of expansion joint, construction joint separation membrane admixtures as approved, curing compound, finishing to lines and grades as per drawing as per IRC 15 -2017 and Section 600 of the specifications, completely, but excluding cost of steel in dowel bar and tie rods including joint sealing complete.	Cum	7698.00

CHAPTER-7

GEOSYNTHETICS AND REINFORCED EARTH FOR ROADS AND BRIDGE WORKS

Notes:

1. The items of this Chapter shall be governed by Section 700 of the Specifications.★
2. Geosynthetics is a general classification for all synthetic material used in geotechnical engineering applications. It shall include geotextiles, geogrids, geonets, geomembrane and geocomposites.
3. Reinforced Earth Retaining walls:
   3.1 The specifications and construction details shall be as per Section 301 of the specifications.
   3.2 Drainage arrangements shall be made as per approved designs.
   3.3 The quantity of filler media shall be calculated as per approved design and specifications and shall be paid separately.
   3.4 Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for seating of bottom most facia panel and capping beam to be calculated as per design and paid separately.
   3.5 Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.
   3.6 The type of reinforcing elements to be adopted shall be as per approved design and specifications. Reinforcing elements and their accessories are to be ascertained from reputed firms in the field of earth reinforcement.
   3.7 The earth fill material shall be clean, free draining, granular with high friction and low cohesion, non-corrosive, coarse grained with not 10 per cent of particles passing 75-micron sieve, free of any deleterious matter, chlorides, salts, acids, alkalies, mineral oil, fungus and microbes and shall be of specified PH value.
   3.8 Capping beam is to be paid separately as per approved design.
   3.9 The cost of reinforced earth retaining wall shall include following:
      i. Excavation for foundation including backfilling.
      ii. Foundation concrete as per approved design.
      iii. Cost of facia panels and their erection
      iv. Cost of reinforcing elements including their fixing and joining with the facia panels.
      v. Drainage arrangement including filter media as per approved design and drawings.
      vi. The compacted earth filling to be retained shall form part of embankment.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
7.1		**Paving Fabric Beneath a Pavement Overlay**		
		Providing and laying paving fabric with physical requirements as per table 700-16 of the specifications over a Tack Coat of paving grade Bitumen VG-10, 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 surface with pneumatic roller to maximise paving fabric contact with pavement surface as per Section-700 of the specifications.	Sqm	335.00
7.2		**Boulder Apron in Crates of Synthetic Geogrids**		

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
		Providing, preparing and laying of geogrid crated apron 1m x 5m, 600 mm thick including excavation and backfilling with baffles at 1 Metre interval, made with geogrids having characteristics as per Section 703.2 of the specifications, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per Section 703.3 of the specifications, filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines as per approved design and Section-700 and 2500 of the specifications.	Cum	4133.00
7.3		**Reinforced Earth Retaining Wall**		
		Construction of facia element for reinforced earth retaining walls including, excavation for foundation, foundation concrete and Cement Concrete grooved seating in foundation concrete for facing elements, facia material and its placement.		
	7.3.1	Facing elements of RCC	Sqm	1801.00
	7.3.2	Assembling, joining with facing elements and laying of reinforcing elements and earth fill with specified material as per specification to be retained by the wall.		
	7.3.2.1	Galvanised carbon steel strips	Metre	323.00
	7.3.2.2	Copper Strips	Metre	294.00
	7.3.2.3	Aluminium Strips	Metre	265.00
	7.3.2.4	Stainless steel strips	Metre	265.00
	7.3.2.5	Glass reinforced polymer/fibre reinforced polymer/polymeric strips	Metre	352.00
	7.3.2.6	With reinforcing elements of synthetic geogrids	Sqm	207.00
7.4		**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 Section 702.2.3 formed in to a stable network and a planar Geo Composite structure, joints wrapped with geotextile to prevent ingress of soil, all as per Section 702 and approved drawings including excavation and backfilling.	Metre	947.00
7.5		**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 Section 702.3 and 309.3.5 including excavation and backfilling.	Metre	727.00
7.6		**Bi-axial Extruded High Modulus Polypropylene Geogrid**		
	7.6.1	Supplying and laying of bi-axial extruded high modulus polypropylene geogrid conforming to specification for base/sub-base reinforcement having minimum tensile strength 15kN/m in the longitudinal and transverse direction, with 5kN/m and 7kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction,	Sqm	188.00

Item No.	Sub Item No.	Description	Unit	Rates (in Rs.)
		junction efficiency not less than 95% and with 38mm X 38mm mesh opening.		
	7.6.2	Supplying and laying of bi-axial extruded high modulus polypropylene geogrid conforming to specification for base/sub-base reinforcement having minimum tensile strength 20kN/m in the longitudinal and transverse direction, with 7kN/m and 14kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening.	Sqm	233.00
	7.6.3	Supplying and laying of bi-axial extruded high modulus polypropylene geogrid conforming to specification for base/sub-base reinforcement having minimum tensile strength 30kN/m in the longitudinal and transverse direction, with 10.5kN/m and 21kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening.	Sqm	277.00
	7.6.4	Supplying and laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORT&H specification for base/sub-base reinforcement having minimum tensile strength 40kN/m in the longitudinal and transverse direction, with 14kN/m and 28kN/m tensile strength at 2% and 5% strain respectively in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm X 38mm mesh opening.	Sqm	321.00

CHAPTER- 8

TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES

Notes:

1. The items of this Chapter shall be governed by Section 800 of the Specifications. ★

2. The road traffic signs shall be as per IRC:67.

3. The signs shall be either reflectorised or non-reflectorised as directed by the engineer in charge.

4. The sign board shall be designed and constructed in such a manner that they withstand the storm and wind loads. The traffic signs shall be mounted on support post which may be of GI Pipe confirming to IS:1239, Rectangular hollow section confirming to IS:4923 or square hollow section confirming to IS:3589.

5. Concrete for footings of the signboards shall be of minimum M-15 grade and reinforcement steel shall be as per IS:1786. Bolts, nuts and washers shall be as per IS:1367. Plate and support sections for sign posts shall conform IS:226 and IS:2062.

6. The retro-reflective sheeting used on the sign shall consist of the white or coloured sheeting having a smooth outer surface which has the property of retro-reflection over its entire surface. It shall be weather-resistant and show colour fastness. It shall be new and unused and shall show no evidence of cracking, scaling, pitting, blistering, edge lifting or curling. The Minimum co-efficient of retro-reflection (determined in accordance with ASTM D: 4956-09) shall be as per table 800-2, 800-3, 800-4, 800-5 and 800-6 of the specifications.

7. The Regulatory/Prohibitory and warning signs shall be provided with white background and red border. The legend/ symbol for these signs shall be in black colour. The Mandatory sign shall be provided with blue background and white Symbol/letter.

8. Cautionary and mandatory signs generally fabricated through process of screen printing. In regard to informatory signs either the message could be printed over the reflective or cut letters of non-reflective black sheeting used for the purpose which must be bonded well on the base sheeting.

9. Overhead signs shall be design to withstand a wind loading of 150 kg/sqm normal to the face of sign and 30 kg/sqm transvers to the face of the sign in addition to the dead load of the structure walkway loading of 250 kg concentrated live load shall also be considered for the design of the overhead sign structure.

10. Overhead signs shall provide a vertical clearance of not less than 5.5 m over the entire width of the pavement and shoulders. The verticals clearance to overhead sign need not be greater than 300mm in excess of minimum clearance of other structure.

11. Road delineators shall confirm to Recommended practices of road delineators IRC:79.

12. Road Markings shall be of ordinary road marking paint hot applied thermoplastic compound, reflectorised paint or cold applied reflective Paint.

13. The boundary stone shall be as per design & specification in IRC:25, the arrangement of letters and script shall be as per IRC:26.

14. The railing shall be of tubular steel in conformance to IS:1239.

15. The concrete barriers shall be constructed with M-20 grade concrete and with High Yield Strength deformed bars.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
8.1		**Cast in Situ Cement Concrete M 20 Kerb**		
		Cast in Situ Cement Concrete M20 kerb Construction with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-15grade 150 mm thick (Using concrete batching and mixing plant), or with kerb laying machine, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per Section 409 of the specifications.		
	8.1.1	PCC M15 for kerb base	meter	229.00
	8.1.2	PCC M20 for kerb cast in situ	meter	241.00
8.2		**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 M15 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 laid manually, all complete as per Section 409 of the specifications. (Using concrete batching and mixing plant).		
	8.2.1	PCC M15 for kerb base	meter	233.00
	8.2.2	PCC M20 for kerb cast in situ	meter	377.00
8.3		**Precast Kerb**		
		Providing and laying at or near ground level Pre-cast kerb stone of M-25 grade in position to the required line, level and curvature jointed with cement mortar 1:3 (1 cement: 3 coarse sand) thickness of joints except at sharp curve shall not to more than 5mm) including making drainage opening wherever required complete as per direction of Engineer-in-Charge.	Cum	5774.00
8.4		**Printing New Letters**		
		Printing new letter of any shade with synthetic enamel paint black or any other approved colour to give an even shade including cost of paint etc. complete and as per relevant specifications. Letters commas and the like not to be measured and paid. Half letter shall be counted as half.		
	8.4.1	Hindi	Per cm height per letter	1.30
	8.4.2	English and Roman letters	Per cm height per letter	1.00
8.5		**Retro-Reflectorised Traffic Signs**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Providing and fixing of Retro- Reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of high intensity grade sheeting vide Section 801.3 of the specifications, 2mm thick aluminium sheeting, 3mm/4mm thick Aluminium composite material sheet depending on the size of the sign fixed over back support frame of minimum 25x25x3mm Angle mounted on a mild steel circular pipe 65 NB, 3.2 mm thickness firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing. The sign shall be maintained as per IRC 67.		
	8.5.1	**Equilateral Triangle**		
	8.5.1.1	120 cm equilateral triangle	Each	6332.00
	8.5.1.2	90 cm equilateral triangle	Each	4699.00
	8.5.1.3	75 cm equilateral triangle	Each	4059.00
	8.5.1.4	60 cm equilateral triangle	Each	3533.00
	8.5.2	**Circular**		
	8.5.2.1	120 cm circular	Each	9364.00
	8.5.2.2	90 cm circular	Each	6403.00
	8.5.2.3	75 cm circular	Each	5243.00
	8.5.2.4	60 cm circular	Each	4292.00
	8.5.3	**Rectangular**		
	8.5.3.1	90 cm x 75 cm rectangular	Each	6637.00
	8.5.3.2	80 cm x 60 cm rectangular	Each	5471.00
	8.5.3.3	80 cm x 50 cm rectangular	Each	4394.00
	8.5.3.4	60 cm x 45 cm rectangular	Each	4215.00
	8.5.5	**Square**		
	8.5.5.1	60 cm x 60 cm square	Each	4753.00
	8.5.6	**Octagon**		
	8.5.6.1	120 cm high octagon	Each	9734.00
	8.5.6.2	90 cm high octagon	Each	6613.00
	8.5.6.3	75 cm high octagon	Each	5267.00
8.6		Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC 67 made of class C Type XI retro reflective sheeting fixed over 2mm thick aluminium sheeting vide Section 801.3 of the specifications, 3mm/4mm thick Aluminium composite material sheet depending on the size of the sign fixed over back support frame of min. 25x25x3mm Angle mounted on a mild steel circular pipe 65 NB ,3.2 mm thickness firmly fixed to the ground by means of properly designed foundation with M25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing. The sign shall be maintained as per section 12 of IRC 67.		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	8.6.1	**Equilateral triangle**		
	8.6.1.1	120 cm equilateral triangle	Each	6475.00
	8.6.1.2	90 cm equilateral triangle	Each	4780.00
	8.6.1.3	75 cm equilateral triangle	Each	4115.00
	8.6.1.4	60 cm equilateral triangle	Each	3569.00
	8.6.2	**Circular**		
	8.6.2.1	120 cm circular	Each	9624.00
	8.6.2.2	90 cm circular	Each	6550.00
	8.6.2.3	75 cm circular	Each	5345.00
	8.6.2.4	60 cm circular	Each	4292.00
	8.6.3	**Rectangular**		
	8.6.3.1	90 cm x 75 cm rectangular	Each	6792.00
	8.6.3.2	80 cm x 60 cm rectangular	Each	5581.00
	8.6.3.3	80 cm x 50 cm rectangular	Each	4463.00
	8.6.3.4	60 cm x 45 cm rectangular	Each	4277.00
	8.6.4	**Square**		
	8.6.4.1	60 cm x 60 cm square	Each	4836.00
	8.6.5	**Octagon**		
	8.6.5.1	120 cm high octagon	Each	10009.00
	8.6.5.2	90 cm high octagon	Each	6767.00
	8.6.5.3	75 cm high octagon	Each	5370.00
8.7		**Direction and Place Identification Signs up to 0.9 Sqm Size Board (Type IV)**		
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC 67 made of High Intensity grade sheeting as per Section 801.3 of specifications, fixed over aluminium sheeting, 2 mm thick or Aluminium composite material sheet with overall thickness of 4 mm with area exceeding 0.9 Sqm fixed over back support frame of minimum 35 x 35 x 3 mm MS Angle mounted on two nos. of mild steel circular pipe 65 NB firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.	Sqm	9193.00
8.8		**Direction and Place Identification Signs up to 0.9 Sqm Size Board (Type XI)**		
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of High Intensity grade sheeting Section 801.3 of specifications, fixed over aluminium sheeting, 2 mm thick or Aluminium composite material sheet with overall thickness of 4 mm with area exceeding 0.9 Sqm fixed over back support frame of minimum 35 x 35 x 3 mm MS Angle mounted on two nos. of mild steel circular pipe 65 NB firmly fixed to the ground by means of properly designed foundation with M 25 grade	Sqm	9423.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.		
8.9		**Direction and Place Identification Signs more than 0.9 Sqm Size Board (Type IV)**		
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of High Intensity grade sheeting Section 801.3 of specifications, fixed over aluminium sheeting, 2 mm thick or Aluminium composite material sheet with overall thickness of 4 mm with area exceeding 0.9 Sqm fixed over back support frame of min. 40 x 40 x 5 mm MS Angle mounted on two nos. of mild steel circular pipe 65 NB, 3.2 mm thickness and 4.5 meter total height firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.	Sqm	16380.00
8.10		**Direction and Place Identification Signs more than 0.9 Sqm Size Board (Type XI)**		
8.11		Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of High Intensity grade sheeting Section 801.3 of specifications, fixed over aluminium sheeting, 2 mm thick or Aluminium composite material sheet with overall thickness of 4 mm with area exceeding 0.9 Sqm fixed over back support frame of min. 40 x 40 x 5 mm MS Angle mounted on two nos. of mild steel circular pipe 65 NB,3.2 mm thickness and 4.5 meter total height firmly fixed to the ground by means of properly designed foundation with M 25 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.	Sqm	16763.00
8.12		**Overhead Signs**		
		Providing and erecting overhead signs with a corrosion resistant 2mm thick aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated Lense type with vertical and lateral clearance given in Section 802.2 and 802.3 of the specifications and installed as per Section 802.7 of the specifications over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans and as per IRC 67.	Sqm	9627.00
	8.12.1	Truss and vertical support	tonne	428567.00
	8.12.2	Aluminium alloy plate over head	Sqm	1430.00
8.13		**Retro Reflectorized Traffic Signs Sheeting on existing Boards (Type XI)**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Providing and pasting on existing sign boards with high intensity Micro-Prismatic Grade cube corner Sheeting (Type XI) as per IRC:67 Clause 6.7.4.3 and as per Section 801.3.4.3 of specifications with messages (legends, numerals, letters etc.,) and borders for the informatory and other sign boards shall be cut out from durable transparent overlay film or cut out from the same reflective sheeting only. Cut-outs shall be from durable transparent overlay materials as specified by the sheeting manufacturer and shall be bonded with the sheeting in the manner specified by the manufacturer and as directed by Engineer-in-Charge. Sheet shall be fixed on the existing board by de-greasing either by acid or hot alkaline etching and all scale/ dirt removed to obtain smooth plain surface before application of high intensity grade cube corner retro reflective sheeting (Type XI) all complete. 10 years warranty for Retro Reflective Sheeting as per Clause 6.9 of IRC:67. The ACM sheet shall be fixed to the post with minimum four number breakaway bolts and supported with a back support frame of 25mm x 25mm x 3mm angle. 7 years warranty for Retro Reflective Sheeting to be provided as per Clause 6.9 of IRC:67 and a certificate of having the sheeting tested for co-efficient of retro-reflection, specular gloss and fungus resistance, drying time colour and luminance, shrinkage, flexibility, linear removal, adhesion, Impact resistance, 3 year outdoor weathering and its having passed this test from an NABL accredited lab as per Clause 6.7 of IRC:67 for the product offered shall be submitted by the contractor. as per Clause 6.7 of IRC:67 for the product offered shall be submitted by the contractor.	Sqm	5273.00
8.14		**Painting on New Concrete Surfaces:**		
		Painting two coats on concrete surface after filling the surface with synthetic enamel paint in all shades as per Section-800 of specifications and IRC:67 including cost of paint etc. complete.	Sqm	83.00
8.15		**Painting on Old Concrete work:**		
		Painting one or more coat to give an even shade on old concrete work with synthetic enamel paint in all shades as per Section-800 of specifications IRC:67 including cost of paint etc. complete.	Sqm	72.00
8.16		**Painting on Steel Surfaces**		
		Providing and applying two coats of ready-mix paint of approved brand on steel surface after thorough cleaning of surface to give an even shade as per Section-800 of specifications and IRC 67 including cost of paint etc. complete.	Sqm	77.00
8.17		**Painting on Wooden Surfaces**		
		Providing and applying two coats of ready-mix plant of approved brand on wood surface after thorough cleaning of surface to give an even shade.	Sqm	84.00
8.18		**Painting on Roads on New work**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		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 surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per Section 800 of specifications and IRC 67 including cost of paint etc. complete.		
	8.18.1	Over 10 cm in width	Sqm	155.00
	8.18.2	Up to 10 cm in width	Sqm	130.00
8.19		**Painting on Roads on Old Work**		
		Painting lines, dashes, arrows etc on roads in two coats on old work with ready mixed road marking paint confirming to IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control as per Section-800 of specifications including cost of paint etc.		
	8.19.1	Over 10 cm in width	Sqm	109.00
	8.19.2	Up to 10 cm in width	Sqm	118.00
8.20		**Road Marking with Hot Applied Thermoplastic Compound with Retro-Reflectorising Glass Beads**		
		Providing and applying 2.5 mm including reflectorising glass beds @ 250 gm per Sqm area thick road marking strips (retro- reflective) of specified shade/ colour using hot thermoplastic material by fully/ semi-automatic thermoplastic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator on road surface including cost of material, labour, T&P, cleaning the road surface of all dirt, seals, oil, grease and foreign material etc. complete as per direction of Engineer-in-charge and as per Section 803 of specifications.	Sqm	438.00
8.21		**Road Markers/ Road Studs with Lense Reflector:**		
		Providing and fixing of Category-A Bi-directional Twin-Moulded Shank Raised Pavement Markers/Road Stud made of Plastic body moulded from ASA (Acrylic styrene Cryometries) or HIP (High impact polystyrene) or ABS material. Lens shall be of plastic material. The marker shall have compressive strength of 13635 kg tested accordance with ASTM D4280 and shall have Flexural Strength of 909 kgf. Reflective panels shall consist of number of lenses containing Single or dual prismatic cubes capable of providing total internal reflection of light entering the lens face. The Slope or the retro-reflecting surface shall be 35 +/- 5 degree to the base and area of Each retro reflecting surface shall not be less than 13 sqcm. When impacted in accordance with 9.4.1 of ASTM D4280, the face of the lens shall show no more than two radial cracks longer than 6.4 mm (0.25 in.). There shall be no radial cracks extending to the edge of the abrasion resistant area. There shall be no delamination. Height of the marker shall not exceed 20 mm and its width shall not exceed 130 mm. Moulded shank RPM shall have the shank strength of 600 kgf. Head of the	each	315.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		stud shall be Smooth and shall not present any sharp edges to traffic. RPM shall be of Category A with optical performance (Coefficient of Luminous Intensity- CIL) shall not be less than that given in Table 800-13 of MoRTH specification (5th revision) for Bi-directional stud. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin-based adhesive. The bidder shall submit a prequalification warranty for Two years. Test certificate from an as per ASTM D 4280, Coefficient of Luminance Intensity-CIL as per MoRTH table 800-13, Material, Marker Height, Colour, Slope of Reflecting Surface (Lens), Lens Impact strength, Resistance to temperature cycling, and Longitudinal Flexural Strength to be submitted.		
8.22		**Road Delineators**		
		Supplying and installation road delineators (road way indicators). as per MORT&H Section 806 of specification. The structure shall be made in roll forming process having height of 800-900 mm above the ground level, width not less than 100 mm and shall extend not more than 200-300mm below the ground while being installed, buried or pressed in to the ground in confirmation with IRC:79, are as directed by the Engineer-in-Charge. The guide post with pure polyester powder coating with minimum 40 microns thickness for protection against corrosion, on top of which Type XI retro reflective sheeting confirming to IRC-67 and ASTMD-4956 shall be pasted on both sides complying to IRC:79. The delineator should consist of minimum retro reflective unit exposed area of 330 cm2 white colour, full cube corner micro prismatic non-metallic retro reflective sheeting on each side conforming with IRC 67and meeting the coefficient of retro reflection values as per ASTM D 4956 Type XI label specification. The delineator shall have grooves across the- length to make the reflective sheets vandal-proof.	each	714.00
8.23		**Boundary Pillars**		
		Providing reinforced cement concrete M20 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting) as per Section 807 of the specifications.	each	703.00
8.24		**Tubular Steel Railing on Medium Weight Steel Channel**		
		Providing, fixing and erecting 50 mm dia. M.S. pipe (medium class) railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.8 m height, 1.2 meters high above ground, 2 m centre to centre, complete as per approved drawings as per Section 800 of the specifications.	meter	4721.00
8.25		**Tubular Steel Railing on Precast RCC Posts.**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Providing, fixing and erecting 50 mm dia M.S. pipe (medium class) railing in 3 rows on precast M20 grade RCC vertical posts1.8 meters high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 meters centre to, complete as per approved drawing as per Section-800 of specifications.	meter	2003.00
8.26		**Reinforced Cement Concrete Crash Barrier**		
		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 bars 25 mm dia, 450 mm 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 enclosure to MOST circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified as per Section-800 of the specifications.		
	8.26.1	M 25 grade concrete	meter	2003.00
	8.26.2	M 30 grade concrete	meter	2073.00
8.27		**Traffic Cone**		
		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, as per specifications	each	464.00
8.28		**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, 150 mm in width at an angle of 450, 'A' frame painted with 2 coats of yellow paint, complete as per provisions of IRC:SP:55.	each	3527.00
8.29		**Barricading (1.6m high)**		
		Providing and fixing 1.6m high barricading during construction with 0.63mm thick GI sheets in double row fixed with 75mm dia. wooden ballies or 50mm dia. MS pipe buried in existing road sufficiently including painting with yellow and black bands by synthetic enamel paint as per the traffic norms and as directed by the Engineer in charge.	Rmt	763.00
8.30		**Barricading (2.0m high)**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Providing and erecting 2.00metre high temporary barricading at site; each panel of size 2.50mx2.00m made of 40x40x6mm angle iron or 50x50x3mm hollow MS tube posts/horizontal members/bracings covered with 1.63mm thick MS sheet. The sheet shall be fixed with 30x5mm MS flat by suitable welding/riveting. The panels shall be made so that gap of 50cm above the ground is available making overall height as 2.5m. MS channel ISLC 75 @ 5.70 kg/m, 50cm long shall be provided at the bottom having oval shaped holes of size 50x25mm at both ends with 50cm long MS angle 40x40x6mm bracing. Suitable arrangement shall be made to fix the barricading to avoid from overturning by providing 250mm long expansion fasteners at both ends. The work shall be executed as per drawing/ direction of Engineer-in-Charge which includes writing and painting, arrangement for traffic diversion such as traffic signals during construction at site for day and night, glow lamps, reflective signs, marking, flags, caution tape as directed by the Engineer-in-Charge. The barricading provided shall be retained in position at site continuously including shifting of barricading from one location to another location as many times as required during the execution of the entire work till its completion. Rate include its maintenance for damages, painting, all incidentals, labour materials, equipment and works required to execute the job. The barricading shall not be removed without prior approval of Engineer-in-Charge.	Rmt	3891.00
	Note: One-time payment shall be made for providing barricading from start of work till completion of work including shifting.			
8.31		Providing and placing 85 mm thick Hydraulically pressed M 40 cement concrete heavy duty covers with slots including steel reinforcement for ingress of water.	Sqm	1112.00
8.32		Providing and fixing 30 mm thick white sand stone over 20 mm (average) thick base of cement mortar 1:5 (1 cement:5 coarse sand) with joints finished flush.	Sqm	861.00
8.33		Providing and fixing 40 mm thick white sand stone over 20 mm (average) thick base of cement mortar 1:5 (1 cement :5 coarse sand) with joints finished flush.	Sqm	890.00
8.34		Providing and fixing 40mm thick red sand stone slab over drains including Pointing in cement mortar 1:3 (1 cement: 3 sand)	Sqm	705.00
8.35		**Metal Beam Crash Barrier**		
	8.35.1	Type - A, "W" : Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per Section 810 of specifications	meter	4647.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	8.35.2	Type - B, "THRIE" : Metal Beam Crash Barrier (Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per Section 810 of specifications.	meter	6292.00
8.36		Flexible Crash Barrier, Wire Rope Safety Barrier Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m centre to centre and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100x8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete.	metre	2588.00
	8.36.1	M 40 grade concrete	metre	3294.00
8.37		**Solar powered Road Marker**		
		Solar powered Road Marker (Solar Stud) Supplying and fixing solar raised Pavement markers made of polycarbonate moulded body with circular shape, solar powered, LED self-Illumination in active mode, 360-degree Illumination and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face in passive mode. The marker shall support a load of 20000 kg tested in accordance to ASTM D 4280, The marker should be resistant to dust and water ingress according to IP 65 standards and should withstand temperatures in the range of 0 c to 70 c colour of lighting could be provided in red or yellow (amber) as per requirement and typical frequency of blinking is 1Hz. There should be current losses of less than 20 microamperes at 2.4 v in sleep charging mode to enhance the life of the marker and a full charge should provide for a minimum autonomy of 50 hours. The height width and length of the marker shall not less than 10 mm x 100 mm x 100 mm. Also, the surface diameter of the marker shall not be less than 100 mm respectively. The weight of the marker shall not exceed 0.5 kilograms fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive and complete as directed by the engineer.	Each	1782.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
8.38		Providing white and colour washing to road side trees in 2 coats in 2 bands of white and one red band at centre of 30 cm height each including preparing the surface, cost of material, conveying etc. complete.	Each	57.00
8.39		Providing and Fixing of **Median Marker** that are made of tough, high impact resistant, injection-moulded, thermoplastic body with an isosceles trapezoidal structure of length, width and height not less than 15cm, 10cm and 10cm respectively and thickness not less than 1.8mm, the body structure shall be rounded at its acute angle, all the corners and edges. The plastic used for moulding the Median Marker shall have a minimum Notched Izod Impact strength value of 600 J/m at room temperature, when tested in accordance with ASTM D256 and shall retain at least 70% of this value when subjected to accelerated weathering for 1000hrs as per ASTM G155 or UL746C. The Median Marker shall have rectangular-shaped, fluorescent yellow colour retro-reflective sheeting of size not less than 8.5cm*8.5cm and with fully reflective micro prismatic cube corners as its retro-reflective elements as per IRC 67 2022 and ASTM D4956 type XI specifications reflectivity values. The retro-reflective sheeting shall be one or both sides of the Median Marker and shall be edge protected with no exposed edges which will prevent edge lifting, vandalism, sheeting damage, etc. The Median Marker shall be fixed by a combination of epoxy adhesive and grouting.	Each	231.00
8.40		Providing and fixing **Rumble Strip made up of TPU Polyurethane (PU**)material size 500LX199WX15H mm and fixing of Rumble Strip in Bituminous grout/Epoxy and screwing the same with 15x100mm etc. including removing asphalt at site, material, labour for fixing grouting and for controlling traffic during fixing etc. complete	Rmt	1650.00
8.41		Providing and laying of 2 or more sets (6 Nos. each set) **Dual Ribs Pattern Rumble Markings** on roads with vehicular speeds of more than 50 Km/hr laid as per the spacing recommended for each set under Table 11.1 and Fig. 11.2 of IRC 35:2015 using Plastirib 2K, or equivalent 2 component cold plastic profiled material Each Dual Rib pattern rumble marking shall have width of 500 mm. Each dual rib pattern rumble marking shall have 2 ribs each of Width of 100 mm and height 20 mm. Gap between two ribs shall be 300 mm. Each rumble marking shall be made complete with drop on Solid Plus reflective glass beads @ 300 gm / One Square Metre spread throughout the surface of marking. The finished surface to be levelled, uniform and free from streaks and holes, including surface cleaning and cost of all materials etc. complete.	Sqm	4333.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
8.42		**Cable Duct Across the Road:** Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC:98- 2011, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 and approved drawings.		
	8.42.1	Single Row for one utility service	Metre	2169.00
	8.42.2	Double Row for two utility services	Metre	3931.00
	8.42.3	Triple Row for three utility services	Metre	5719.00
8.43		**Kilo Metre Stone:** Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc		
	8.43.1	5th Km stone (precast)	each	3484.00
	8.43.2	Ordinary Km stone (Precast)	each	2053.00
	8.43.3	Hectometre stone (Precast)	each	587.00
8.44		**Boundary Pillar Reinforced Cement Concrete** M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting.	Each	546.00
8.45		**G.I Barbed Wire Fencing 1.2 metre high** :Providing and fixing 1.2 metres high GI barbed wire (weighing 9.38 kg per 100 mts.) fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres centre to centre founded in M15 grade cement concrete, 0.6 metre 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 Section 808 of the specifications.	metre	342.00
8.46		**G.I Barbed Wire Fencing 1.8 metre high**: Providing and fixing 1.8 metres high GI barbed wire (weighing 9.38 kg per 100 mts.) fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres centre to centre founded in M15 grade cement concrete, 0.6 metre 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 Section 808 of the specifications.	metre	557.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
8.47		Providing and fixing **Aluminium-backed flexible prismatic sheeting** consisting of yellow coloured flexible prismatic sheeting with non- metallic prismatic lens as retro reflective elements and conforming to ASTM D 4956-09 Type-VI specification values for rebound able sheeting. AFP sheeting shall be of 1ft width with a 50-micron thick Aluminium (Al) foil with pressure sensitive adhesive and liner. AFP sheeting shall have screen printed arrow/slant line pattern in black colour on top and shall not crack when tested for flexibility as per section S2.2.2 of ASTM D 4956-09. The AFP sheeting shall be applied with a neoprene contact adhesive with Polychloroprene as base and the edges of the product shall be sealed all around with a two-part epoxy based structural adhesive and shall be extremely resistant to peel-off and shall confirm to IRC: 79:2019. The AFP shall be provided with Government test report from ARAI/ CRRI/ ICAT and report confirming to coefficient of retro reflection, Flexibility and impact resistance test as per ASTM which shall be submitted to Engineer-in-Charge.	Sqm	5200.00
8.48		Providing and fixing **Advance Warning Speed Arrester Stud** made out of poly carbonate/ABS moulded body and highly reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face with retro reflectance and chromaticity values shall be as given in the detailed specifications and the product shall conform to minimum ASTM D4280 and also meet all the testing conditions of ASTM D4280 listed for RPM (Raised Pavement Marker). The testing and test report shall be as per IRC 35 Section .1.2. The speed arrester should be fixed to the road surface using the adhesive recommended by the manufacturer. The length, height and width of the body shall not be less than 150 mm, 9 mm and 90 mm with a tolerance of +/-1 mm. The marker shall support a load of 30000 Kg tested in accordance with ASTM D4280. The area of each side of micro prismatic reflective lens shall not be less than 15.0 sq.cm. The slope or retro – reflective surface shall be 25 + 2 degree to base. It should have one Shank of not less than 25 mm diameter and not less than 40 mm length moulded with the body for anchorage. The certificate confirming to initial CIL value for reflective lens not less than 125 for red lens, 250 for yellow lens and 400 for white lens at 0° entrance and 0.2° observation angle as per ASTM D4280 shall be provided for better visibility and improving road safety for commuters.	Each	410.00

CHAPTER-9

SUPPLY OF MINERAL AGGREGATES

Notes:

1. The items of this Chapter shall be governed by Section 100 and Section 1000 of the Specifications. ★

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
9.1		Supply of mineral aggregate like broken stone/crushed stone /stone dust/ moorum at road site including all lead and stacking etc. complete.		
	9.1.1	63mm standard size broken stone	cum	633.00
	9.1.2	45mm standard size broken stone	cum	633.00
	9.1.3	40mm standard size crushed stone	cum	633.00
	9.1.4	26.5mm standard size crushed stone	cum	806.00
	9.1.5	22.4mm standard size crushed stone	cum	825.00
	9.1.6	13.2mm standard size crushed stone	cum	950.00
	9.1.7	11.2mm standard size crushed stone	cum	798.00
	9.1.8	6.7mm standard size crushed stone	cum	795.00
	9.1.9	Crusher stone dust	cum	199.00
	9.1.10	Moorum with CBR not less than 7	cum	345.00
	9.1.11	Fine sand	cum	2000.00

CHAPTER-10

ROUTINE AND PERIODIC MAINTENANCE OF ROADS

Notes:

1. The items of this Chapter shall be governed by Section 3000 of the Specifications. ★

2. This chapter consists of routine and periodic maintenance of roads however; repairs and rehabilitation of roads is covered under Chapter 16 of this ISSR.

3. For repair of rain cuts fresh material (as per Sub-section 301) shall be placed in layers not exceeding 250 mm loose thickness and compacted so as to match with the benching at a moisture content close to the optimum. The area affected by the rain cuts shall be cleared of all loose soil and benched before laying of fresh material. The width shall be 300 mm and height shall be 150 to 300 mm.

4. The work of maintenance of earthen shoulder shall include making up the irregularities/loss of material on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment's or to strip excess soil from the shoulder surface as per the requirements of this specification.

5. The material used in maintenance operation shall be of a standard not less than those specified for the original construction.

6. Pot-hole and patch repair

(i) Each pot-hole and patch repair area shall be inspected and all loose material removed.

(ii) In the preparation of the area for pot hole and patch repair the area for repair shall be cut/trimmed either with jack hammers or with hand tools suitable for the purpose, such that the defective material responsible for the failure is all removed and such that the excavation is of a regular shape. The edges of the excavation shall be cut vertically. The area shall be completely cleaned by any suitable method.

(iii) Layers below the level of the bituminous connection shall be replaced and compacted.

(iv) The area for bituminous construction shall be tacked or primed with emulsion depending upon whether the lower area is bituminous or granular in nature. The side, however, are to be painted with hot tack coat material using the brush.

(v) The mixture to be used in bituminous patching shall be either a hot mix or a cold mix.

(vi) The bituminous mixture shall be placed in layers of thickness not more than 100 mm (loose) and shall be compacted in layers with roller/plate compactor/hand roller/rammer to the compaction as per specification.

(vii) While placing the final layer, the mix shall be spread slightly proud of the surface so that after rolling, the surface shall be flush with the adjoining surface.

(viii) If the area is large, the spreading and levelling shall be done using hand shovels and wooden straight edges.

7. Cement Concrete Road (Repair of Joint Grooves with Epoxy Mortar or Epoxy Concrete)

(i) The work shall consist of repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints is a concrete pavement using epoxy mortar or epoxy concrete.

(ii) Spalled or broken edges shall be shaped neatly with a vertical cut in the shape of rectangle. The depth of the cut shall be the minimum to effect repair. After shaping the spalled area, it shall be cleaned and primed.

(iii) The epoxy mortar/concrete is then applied using hand tools like trowels, straight edges, brushes etc.

(iv) The repaired edge shall be in line with the joint groove and shall be flush with the concrete slabs.

(v) The epoxy mixes set in 2-3 hours time, it is desirable to divert the traffic for 12 hours.

8. Crack filling

(i) Crack filling shall be carried out using a binder of a suitable viscosity, normally a slow-curing bitumen emulsion.

(ii) For wider cracks, in excess of an average of 3 mm in width the application of emulsion may be preceded by an application of crusher dust.

(iii) If dust is to be used it shall be place in the cracks before the application of binder and the cracks filled to a level approximately 5 mm below road surface level.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
10.1		Filling Pot- holes and Patch Repairs with (bitumen content 3.7%of mix) open - graded Premix surfacing, 20mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per Section 503, back filling the pot holes with hot bituminous material as per Section 510, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per Section 3004 of the specifications.	Sqm	141.00
10.2		Filling Pot- holes and Patch Repairs with - Bituminous concrete, 40mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per Section 503, back filling the pot holes with hot bituminous material as per Section 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per Section 3004 of the specifications.		
	10.2.1	For grading I Material	Sqm	413.00
	10.2.2	For grading II Material	Sqm	409.00
10.3		**Crack Filling** (Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.) As per relevant clauses of Section 3000 of the specifications.	meter	4.00
10.4		**Dusting** (Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.) As per Section 3000 of the specifications.	meter	2.00

10.5		**Repair of Joint Grooves** with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete) as per Section 3000 of the specifications.	meter	1501.00
10.6		**Repair of Old Joints Sealant** (Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material) As per Section 3000 of the specifications.	meter	43.00
10.7		**Hill Slide Drain Clearance** Removal of earth from choked hill side drain and imposing it on the valley side manually	meter	56.00
10.8		**Land slide clearance in soil** Clearance of land slide in soil and ordinary rock by bull-dozer and disposal of the same on the valley slide.	cum	52.00
10.9		**Replacement of Metal Beam Crash Barrier**		
	A	Type - A "W": Metal Beam Crash Barrier		
		Replacement of 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, 150x75x5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, al steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150x75x5 mm, 330 mm long complete as per Section 811 of the specifications.	meter	3832.00
	B	**Type - B "THRIE": Metal Beam Crash Barrier**		
		Replacement of 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, 150x75x5 mm spaced 2 m centre to centre, 2 m high, 1.15 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150x75x5 mm, 546 mm long complete as per Section 811 of the specifications.	meter	4579.00
10.10		**Network Survey Vehicle (NSV) attached with SUV**		
		Data collection of longitudinal profiling (International Roughness Index), Transverse profiling (Rut Depth), Pavement Texture in terms of Mean Profile Depth, Road Geometry Data (cross slope, gradient, curvature), GPS Coordinates (X, Y, Z) Via, longitude, latitude and altitude, Video Imaging for Pavement Surface Distresses and reports.	meter	185.00
10.11		Pot-hole repair of existing bituminous roads with hot-mix bituminous material (Bitumen content 4% by weight of total mix) and aggregates conforming to Section 507 of the specifications or as required by site condition, including cleaning of surface, cutting edges of pot-hole or patches vertically in rectangular or square shape, and compaction by means of rollers or Vibrating Compactor /Impact Tampers, excluding tack coat.	MT	3200.00

10.12		Patch repairs or profile correction by paver of existing bituminous roads with hot-mix bituminous material (Bitumen content 4% by weight of total mix) and aggregates conforming to Section 508 or as required by site condition, including cleaning of surface, cutting edges of patches vertically in rectangular or square shape, and compaction by means of rollers excluding tack coat.	MT	3269.00
10.13		Resealing of old Joints by Sealant Removal of existing sealant and resealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material, as per Section 3000 of the specifications.	meter	45.00
10.14		Repair of joint Grooves with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete, as per Section 3000 of the specifications.	meter	1501.00
10.15		Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, upto 20mm thickness.	Sqm	108.00
10.16		Filling Pot-holes and Patch Repairs with Bituminous concrete, upto 40mm thickness.		
(i)		For grading I Material	Cum	272.00
(ii)		For grading II Material	Cum	277.00
10.17		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 cationic bitumen emulsion @ 21.5 kg per 10 Sqm and seal coat type B with bitumen emulsion @ 10kg per 10 Sqm as per technical specification and compacting with three wheeled 80-100 kN Static Roller.	Sqm	307.00
10.18		Repair to pot holes and removal of loose material, trimming of sides, cleaning of surface by providing Primer coat, tack coat, 20 mm thick pre-mix carpet material having binder content @ 14.6 kg per Sqm and seal coat type B having bitumen content @ 6.8 kg per 10 Sqm as per technical specification and compacting with three wheeled 80-100 kN Static Roller.	Sqm	298.00
10.19		Filling Pot- holes and Patch Repairs with - Bituminous concrete, 40mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per Section 503, back filling the pot holes with hot bituminous material as per Section 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per Section 3004 of the specifications.		
	10.9.1	For grading I Material	Sqm	336.00
	10.9.2	For grading II Material	Sqm	346.00

10.20		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 75mm B.M, applying bitumen tack coat at the bottom and vertical sides as per Section 3004 of the specifications.	cum	8939.00
10.21		Pot Hole filling with Jet Patcher-Repairs to potholes 50 mm upto 100 mm by using semi dense bituminous concrete in cold mix by using emulsion including making the potholes /patches in regular shape and size. Removing loose pockets, dewatering in potholes, tack coats of 25 Kilogram/10 Sq. Mt. with RS1 emulsion etc.by use of advanced jetpacking technology machine of approved make and specification having capacity 5.50 TO 8.00 cubic meters with auxiliary engine with direct drive to heavy duty blower, Rotary Positive Displacement Blower with direct drive and separate airline silencer. (Capacity – 15 PSI, Flow rate 1370/cum/hr). cleaning as directed by Engineer – in-Charge etc. complete (Emulsion @ 5% by weight of mix)		
	10.21.1	Upto 50mm	Sqm	1317.00
	10.21.2	50mm-100mm	Sqm	1867.00
10.22		Mixing and applying of 30mm thickness Repair material confirming to IRC SP 83-2018 clause 12.1.2.a and 12.1.4 an ultra-fast strength concrete repair mortar which does not require external water curing and attains compressive strength of 40N/mm2 @ 5 hours from placing as per IS 516, after diluting it with 10mm aggregates at a proportion of 1:0:5 (concrete 10mm aggregates); mixing and placing the mortar as per manufactures data sheet over the prepared surface of the pavement, complete along strengthening, no water curing and opening the road to traffic within 5-6 hours of placing(the last bag of mortar).	Sqm	655.00

CHAPTER-11

HORTICULTURE & LANDSCAPING

Notes:

1. In case where unsuitable soil is met with, it shall be either removed or replaced with good earth.
2. Weeds or other vegetation which appear on the ground are to be uprooted and removed and disposed off.
3. Generally the depth of trenching is 30cm for grassing in good soil. The trenched ground shall, after rough dress, be flooded with water by making small kiaries to enable the soil to settle down.
4. Trenching shall consist of the following operations
   (i) The whole plot shall be divided into narrow rectangular strips of about 1.5 m width.
   (ii) These strips shall be sub-divided lengthwise into about 1m long sections.
   (iii) Such sections shall be excavated serially and excavated soil deposited in the adjacent section preceding it.
   (iv) In excavating and depositing care shall be taken that the top soil with all previous plant growth including roots, get buried in the bottom layer of trenched area, the dead plants so buried incidentally being formed into humus.
   (v) The excavated soil shall be straight away dumped into the adjoining sections so that double handling otherwise involved in dumping the excavated stuff outside and in back filling in the trenches with leads is practically eliminated.

5. Grassing

(i) The soil shall be suitably moistened and then the operation of planting grass shall be commenced.
(ii) Dead grass and weeded shall not be planted.
(iii) Watering of the lawn shall be done for 30 days.

6. Renovation Of Lawns

The area shall be first weeded out of all undesirable growth. The entire grass shall be crapped (cheeled) without damaging roots and level of the grounds. Slight irregularities in surface shall be levelled off and the area shall then be forked so as to aerate the roots of the grass without, however up-rooting them.

7. Digging Holes for Planting Trees

(i) Holes of circular shape in ordinary soil shall be excavated to the dimensions described in the items and excavated soil broken to clods of size not exceeding 75mm shall be stacked outside the hole, stones, brick bats, unsuitable earth and other rubbish, all roots and other undesirable growth met with during excavation shall be separated out and unserviceable material shall be removed. Useful material, if any, shall be stacked properly and separately. Good earth in quantities as required to replace such discarded stuff shall be brought and stacked at site by the contractor which shall be paid for separately.
(ii) The tree holes shall be manured at the specified rate shall be uniformly mixed with the excavated soil in the specified proportion, the mixture shall be filled in to the hole up to the level of adjoining ground and then watered and enable the soil to subside the refilled soil.
(iii) Where holes are dug in (a) Hard soil (b) Ordinary rock or (c) Hard rock, the above soils occurring independently over in conjunction with Each other and /or ordinary soil in any hole, the different excavated soil shall be stacked separately.
(iv) Sufficient quantity of good soil to replace the solid volume of stones, brick bats, unsuitable earth and other rubbish, all roots and other undesirable growth, ordinary and hard stacks shall be brought and stacked at site but the supply and stacking of such shall be paid for separately.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
11.1		**Permanent Hedges**		
		Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with compost/manure, (compost/manure will be paid separately) and supplying and planting hedge plants (lemon, duranta, Red ive, Clerodendrum, pedilanthus etc. at 30 cm apart including watering and maintenance for 3 months).	Meter	283.00
11.2		**Planting of Trees and Maintenance**		
		Planting of Trees and their Maintenance for one 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 manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year).	Each	1164.00
11.3		Supplying, stacking and spreading of good earth for plantation at site including royalty and carriage (earth measured in stacks will be reduced by 20% for payment.	Cum	375.00
11.4		Supplying and stacking sludge at site including royalty and carriage up to 1 km (sludge measured in stacks will be reduced by 8% for payment).	Cum	213.00
11.5		Supplying, stacking and spreading compost/manure from approved source, (manure measured in stacks will be reduced by 8% for payment)	Cum	207.00
11.6		Spreading only of Sludge 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	33.00
		Uprooting Vegetation and Weeds		
11.7		Uprooting rank vegetation and weeds by digging the area to a depth of 30 cm removing all weeds and other growth with roots by forking repeatedly, breaking clods, rough dressing, flooding with water, uprooting fresh growths after 10 to 15 days and then fine dressing for planting new grass, including disposal of all rubbish with all leads and lifts.	Sqm	26.00
11.8		**Grassing**		
		Grassing with 'Doob' grass including watering and maintenance of the lawn for 1 year or more till the grass forms a thick lawn free from weeds and fit for mowing. **(if needed good earth shall be paid separately).**		
	11.8.1	In rows 15 cm apart in either direction.	100 Sqm	5725.00
	11.8.2	In rows 7.5 cm apart in either direction.	100 Sqm	5981.00
	11.8.3	In rows 5 cm apart in either direction.	100 Sqm	6243.00
11.9		Providing and laying Selected type of Grass turf with earth 50mm to 60mm thickness on existing ground prepared with proper level and ramming with required tools wooden and then rolling the surface with light roller, making the surface smoothen and light watering the same, as per direction of Engineer-in-Charge.	Sqm	99.00
11.10		Providing and Laying Mexican/Zosia carpet grass Turf with earth 50mm to 60mm thickness on existing ground prepared with proper level and ramming with tools wooden (Durmuth) and then rolling the surface with light roller make the surface	Sqm	310.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		smoothen and light watering with sprinkler and maintenance for 30 days or more till the grass establishes properly, as per direction of Engineer-in-Charge.		
11.11		**Digging Holes for Plantation**		
		Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure, sludge or extra good earth if needed to be paid for separately)		
	11.11.1	Holes 120 cm dia and 120 cm deep.	Each	141.00
	11.11.2	Holes 60 cm dia and 60 cm deep.	Each	61.00
	11.11.3	Holes 45 cm dia, and 45 cm deep.	Each	19.00
	11.11.4	Holes 30 cm dia, and 30 cm deep.	Each	9.00
11.12		Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod (Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass or any other variety of grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 Sqm) including as directed by Engineer-in-Charge.		
	11.12.1	For one-year maintenance	Sqm	220.00
	11.12.2	For three-year maintenance	Sqm	280.00
	11.12.3	For five-year maintenance	Sqm	400.00
11.13		Maintenance of Lawns or Turfing of Slopes (Maintenance of lawns or turfing of slopes (rough grassing) for a period of one year including watering etc).	Sqm	130.00
	11.13.1	Maintenance of Lawns with Fine Grassing for the First Year Payment shall be made First year 50% Second year 20% third year 30 % for DLP Three Years for the plants survive at that time shall be deducted for plants found dead after three years.	Sqm	150.00
	11.13.2	Maintenance of Lawns with Fine Grassing for the First Year Payment shall be made First year 30% Second year 10% third year 10 % fourth year 10% and fifth year 40% for DLP Five Years for the plants survive at that time. Shall be deducted for plants found dead after five years.	Sqm	350.00
11.14		Turfing Lawns with American/Carpet Grass, fine Grassing including Ploughing, Dressing (Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 Sqm) including maintenance one year.	Sqm	280.00
11.15		**Plantation**		
		Providing and planting different variety of plants of approved quality and sizes as mentioned including making pits of required size at site, refilled with B.C. Soil mixture manuring and pesticide etc. complete (to be paid separately) including watering and 90 days maintenance from the date of final bill as per direction of Engineer-in-Charge complete in all respect (B.C. Mixture paid separately).		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	11.15.1	**Shrubs:**		
		Bauhinia tomentosa, Beloperone species, Caesalpinia pulcherrima, Bird of Paradise, Calliandra emarginata, Calliandra hybrida, Cassia biflora, Cassia laevigata, Cestrum nocturnum, Dombeya mastersii, Euphorbia caracasana, Euphorbia pulcherrima, Echoreia bicolor, Echoreia tricolor, Ficus blackii, Ficus reginold, Ficus panda, Gardenia jasminoides, Hamelia patens, Heliconia spp., Hibiscus rosa-sinensis, Hibiscus variegata, Hibiscus Viceroy, Jatropha multifida, Lagerstroemia indica, Malpighia coccigera, Murraya exotica, Murraya koenigii, Murraya sambucum, Mussaenda erythrophylla, Nerium oleander, Nyctanthes arbor-tristis, Plumbago capensis, Putranjiva roxburghii, Tabernaemontana coronaria, Tabernaemontana divaricata, Tecoma gaudi chaudi, Tecoma stans, Thevetia nerifolia, Thuja compacta, and equivalent plants.	Each	100.00
	11.15.2	**Creeper plants (height: 30cm to 45 cm)**		
		Allamanda cathartica, Allamanda grandiflora, Allamanda violacea, Bignonia venusta (Flame Vine), Bougainvillea (varieties including Buttiana, Lady Mary Baring, Mahara, Mohan, Scarlet Queen Variegata, Glabra Formosa, Peruviana Odissi, Partha, Shubhra, Thimma, spectabilis, L.N. Birla, and Refulgent), Clerodendrum splendens, Clerodendrum thomsoniae, Ipomoea purpurea, Jasminum grandiflorum, Jasminum humile (Yellow Jasmine), Passiflora caerulea (Rakhi Bel / Blue Passion Flower), Petrea volubilis (Sandpaper Vine), Quisqualis indica (Rangoon Creeper), Tecoma grandiflora (Trumpet Vine), Vernonia elaeagnifolia (Curtain Creeper), Mandevilla splendens, Garlic Creeper and calamities.	Each	63.00
	11.15.3	**Ground cover plants height: 30cm-45cm**		
		Alpinia variegata, Alternanthera species, Asparagus meyeri, Asparagus sprengeri, Aspidistra elatior, Canna indica (regular and dwarf varieties), Clerodendrum inerme, Chlorophytum comosum (green) and Chlorophytum comosum variegatum, Coffea chinensis, Dianella variegata, Duranta varieties (Goldiana, Green, Variegata), Euphorbia milli hybrid, Ipomoea batatas (golden leaves), Iresine herbstii, Juniperus procumbens (Prostrata), Juniperus Africana, Ophiopogon japonicus and Ophiopogon Jaburan, Portulacaria afra (Jade Plant), Schefflera arboricola (green) and Schefflera arboricola variegata, Setcreasea purpurea (Purple Heart), Syngonium varieties (Butterfly, Miniature, Dwarf, Variegated), Tradescantia zebrina, Wedelia trilobata, Zebrina pendula, Pandanus veitchii, Spider Lily (Hymenocallis littoralis) and Spider Lily variegated, Acalypha varieties (Red, Green, Mini), Lantana camara varieties (Red, Yellow, Purple, White, Variegated), and similar plants.	Each	63.00
	11.15.4	**Winter seasonal height: 20-30 cm**		
		Any of one from Alyssum, Anemone, Antirrhinum Hybrid, Aster Hybrid, Begonia and its different varieties, Calendula, Carnation, Coleus, Daisy, Dianthus, Freesia, Gazania, Impatiens, Kalanchoe, Marigold Inca, Mesembryanthemum, Nemesia, Nasturtium, Ornamental Kale, Pansy Hybrid	Each	53.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Sakata, Petunia Hybrids such as Bravo, Star and Picotee, Salvia, Stock, Verbena.		
	11.15.5	**Summer and rainy seasonal plants**		
		Any of one from Celosia, Caladium Hybrid, Cockscomb, Cosmos, Gaillardia, Gomphrena, Kochia scoparia, Portulaca, Sunflower Hybrid, Sunflower Single, Tapioca (Manihot esculenta) Variegated (Manihot Esculenta), Vinca rosea, Zinnia Hybrids.	Each	53.00
	11.15.6	Rose Budded of H.T variety and miniature Roses. height: 30cm & above	Each	213.00
	11.15.7	Plant Creeper Rose Varieties	Each	265.00
	11.15.8	Standard Roses H.T. Variety	Each	478.00
11.16		**Transplantation**		
		Transplantation of trees including trimming the branches of full grown trees as per the requirement, giving the wax treatment of the trimmed area of branches, uprooting the tree and transporting the uprooted tree to the specified site of the transplantation as directed by the engineer-in-charge upto 12 km lead including all lifts, transplanting the uprooted tree by digging a required size of pit, filling it with fresh garden soil and manure as per the requirement and maintaining it for a period of 4 months by watering, weeding, manuring etc complete.		
	11.16.1	Trees having trunk girth up to 1.0 metre	Each	5301.00
	11.16.2	Trees having trunk girth more than 1.0 metre up to 1.5 meter	Each	7953.00
	11.16.3	Trees having trunk girth more than 1.5 metre up to 2.0 metre	Each	10604.00
	11.16.4	Trees having trunk girth more than 2.0 metre	Each	12723.00
		Note: After completion of plantation only 60% of the above rates will be paid. However, the balance 40% shall be paid after the expiry of maintenance period i.e. 4 months. Balance 40% shall not be payable if the tree doesn't survive after the maintenance period.		
11.17		Providing & fixing tree guard of specified size with Angle Iron/ Flats and welded mesh or chain-link mesh as per approved design by Engineer in charge including applying approved steel primer.		
	11.17.1	Steel work in built up section for construction of tree guard	Kg	84.00
	11.17.2	Providing and fixing welded steel square / rectangular mesh of required size & applying a priming coat of approved steel primer.	Kg	106.00
	11.17.3	Providing and fixing G.I. chain link mesh of required size made of G.I. wire including strengthening with 2mm dia wire or nuts, bolts & washers as required complete.	Kg	123.00
11.18		Providing and fixing of White Marbles circular/oval in shape (stone) pebbles of size 2"to 2.50" dia in natural colour at site of work including loading, unloading, carriage with all taxes paid etc. and as per direction of Engineer-in-Charge.	Kg	28.00
11.19		Providing and fixing of 3-seater stone bench made of 75mm thick stone slab finished by different numbers of ambry stone and two coats of 124 no sealer coat to prevent from weather including fixing on a pedestal (cost of pedestal to be paid separately) etc. complete as per direction of engineer in charge. Size: length 1500mm, width 600mm, legs height 500 mm, back support height 500mm.	Each	12125.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
11.20		Providing and fixing of stone table made of 75mm thick stone slab finished by different numbers of ambry stone and two coats of 124 no sealer coat to prevent from weather including fixing on a pedestal (cost of pedestal to be paid separately) etc. complete as per direction of engineer in charge. Size: length 1000mm, width 600mm, legs height 750 mm.	Each	9875.00
11.21		Planting of Trees and their Maintenance for three Year Planting of various verities such as Pipal (Ficus religiose), Bargad (Ficus benghalensis), Neem (Azadirachta indica), Ashok (Saraca Asoca), Kadam (Neolamarckia cadamba), Aam (Mango), Gulmohar (Delonix regia), Amaltas (Hibiscus rosa-sinensis), Bougainvillea) (Bougainvillea glabra), Lantana (Lantana camara) etc. of trees as approved by the Engineer-in-charge by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, and maintaining the plants excluding tree guard.		
	11.21.1	Minimum Plant Height 1.00 M	Each	2250.00
	11.21.2	Minimum Plant Height 1.50 M	Each	2750.00
	11.21.3	Minimum Plant Height 2.00 M	Each	3250.00
	11.21.4	Minimum Plant Height 2.50 M	Each	3750.00
	11.21.5	Minimum Plant Height 3.00 M	Each	4750.00
		Note:-(i) Payment shall be made as First year 50%, Second year 30% and third year 20% for DLP of Three Years for the plants survived at that time. Payment shall be deducted for any plants found dead at the end of the three-year maintenance period.		
11.22		Planting of various varieties such as Peepal (Ficus religiosa), Banyan (Ficus benghalensis), Neem (Azadirachta indica), Ashoka (Saraca asoca), Kadam (Neolamarckia cadamba), Mango (Mangifera indica), Gulmohar (Delonix regia), Amaltas (Cassia fistula), Bougainvillea (Bougainvillea glabra), Lantana (Lantana camara**)**, etc., as approved by the Engineer-in-Charge, along the roadside (avenue trees) in 0.60 m dia holes, 1 m deep, dug in the ground. The work includes mixing the soil with decayed farmyard/sludge manure, planting the saplings, backfilling the trench, watering, and maintaining the plants for five years, **excluding tree guards**.		
	10.22.1	Minimum Plant Height 1.00 M	Each	3250.00
	10.22.2	Minimum Plant Height 1.50 M	Each	3750.00
	10.22.3	Minimum Plant Height 2.00 M	Each	4250.00
	10.22.4	Minimum Plant Height 2.50 M	Each	4750.00
	10.22.5	Minimum Plant Height 3.00 M	Each	5750.00
		Note:-(i) Payment shall be made as First year 30%, Second year 10%, third year 10 %, fourth year 10% and fifth year 40% for DLP of Five Years for the plants survived at that time. Payment shall be deducted for any plants found dead at the end of the five-year maintenance period.		
11.23		**Associated Miscellaneous Works**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Half Brick Circular Tree Guard, in 2nd class Brick, internal dia 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground Half brick circular tree guard, in 2nd class brick, internal dia 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete.	Each	2488.00
11.24		Edging with 2nd class Bricks, laid dry lengthwise Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres.	metre	51.00
11.25		Making Tree Guard 53 cm dia and 1.3 m high as per design from empty bitumen drum (Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos. MS sheet rings 50 x 0.5 mm with rivets, complete in all respect).	Each	872.00
11.26		Making Tree Guard 53 cm dia and 2 metres high as per design from empty bitumen drums (Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos. MS sheet rings 50 x 0.5 mm with rivets complete in all respects).	Each	1810.00
11.27		RCC Pre Cast Tree Guard Providing and fixing RCC precast tree guard of 2.00 meters height in a square shape with a minimum thickness of 50 mm. The tree guard shall be installed by excavating up to 0.50 meters depth and secured in place with M-15 grade concrete all around up to 0.15 meters thickness. Adequate openings shall be provided to ensure proper air circulation and sunlight exposure for the tree's growth.		
	10.27.1	600 mm x 600 mm	Each	1500.00
	10.27.2	750 mm x 750 mm	Each	1800.00
	10.27.3	1000 mm x 1000 mm	Each	2100.00
11.28		Providing and Fixing Barbed Wire Type A- The Barbs shall have four points and shall be formed by Twisting Two-point wires each two turns, tightly around both the line wires making all together four complete turns line wire 2.5 mm point wire 2.0 mm distance between two barbs 150mm.	Kg	85.00
11.29		RCC Fencing Poles 1.6-meter Height	Each	168.00
11.30		RCC Fencing Poles 1.8-meter Height	Each	184.00
11.31		RCC Fencing Poles 2.0-meter Height	Each	200.00
11.32		RCC Fencing Poles 2.3-meter Height	Each	248.00
11.33		RCC Fencing Poles 2.45-meter Height	Each	266.00
11.34		RCC Fencing Ples Bend Type-I 2.45+0.45 metre	Each	340.00
11.35		RCC Fencing Ples Bend Type-II 3.00+0.75 metre	Each	350.00

CHAPTER-12

FOUNDATIONS FOR BRIDGES

Notes:

1. The items of this Chapter shall be governed by Section 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1900 and 2100 of the Specifications. ★

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
12.1		**Excavation for Structure**		
		Earth work in excavation of foundation of structures with all lifts & lead upto 1000 meters 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 as per section 300 and 2100 of the specifications.		
	A	**Soil**		
	12.1.1	**By Manual Means**		
	12.1.1.1	upto 3 m depth	cum	204.00
	12.1.1.2	3 m to 6 m depth	cum	263.00
	12.1.1.3	Above 6 m depth	cum	350.00
	12.1.2	**By Mechanical Means**		
	12.1.2.1	upto 3 m depth	cum	119.00
	12.1.2.2	3 m to 6 m depth	cum	132.00
	12.1.2.3	Above 6 m depth	cum	147.00
	B	**Ordinary rock**		
	12.1.3	**By Manual Means**		
		upto 3 m depth	cum	292.00
	12.1.4	**By Mechanical means**		
		upto 3 m depth	cum	563.00
	12.1.5	**Hard Rock (requiring Blasting)**	Cum	333.00
	12.1.6	**Hard Rock (Blasting Prohibited)**	Cum	761.00
	Note:	*1. Cost of dewatering may be added where required as per rates of dewatering in item No.- 2.13 of this ISSR.* *2. The cost of shoring and shuttering, where needed, may be added @ 1 Percent on cost of excavation for open foundation.*		
12.2		Providing and laying levelling course in foundation, filling annular spaces around footing in rock upto top of rock in lean cement concrete M-10 nominal mix in as per section 1000, 1500, 1700 and 2100 of the specifications.	cum	4681.00
12.3		Providing Brick masonry in cement mortar 1:3 (1cement :3 sand) with well burnt chimney bricks (crushing strength not less than 40kg /sqcm and water absorption not more than 15%) in foundation complete excluding pointing and plastering, as per drawing and technical specifications and as per sections 1000, 1300 and 2100 of the specifications.	cum	7908.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
12.4		Providing Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification and as per sections 1100, 1400 and 2100 of the specifications.		
	12.4.1	Coursed rubble masonry (First Sort)	cum	5070.00
	12.4.2	Random Rubble Masonry	cum	5103.00
12.5		Providing and laying Plain/Reinforced cement concrete in open foundation including form work shuttering etc. complete as per drawing and technical specifications and as per sections 1000, 1500, 1700 & 2100 of the specifications.		
	12.5.1	PCC Grade M15	cum	4257.00
	12.5.2	PCC Grade M20	cum	4751.00
	12.5.3	PCC Grade M25	cum	5136.00
	12.5.4	PCC Grade M30	cum	5173.00
	12.5.5	RCC Grade M20	cum	5174.00
	12.5.10	RCC Grade M25	cum	5331.00
	12.5.15	RCC Grade M30	cum	5407.00
	12.5.18	RCC Grade M35	cum	5572.00
12.6		Providing and laying cutting edge of mild steel (weighing 40 kg per meter minimum) for well foundation complete as per drawing and technical specification and as per sections 1200 & 1900 of the specifications.	tonne	109421.00
12.7		Providing and laying Plain/Reinforced cement concrete in well foundation complete as per drawing and technical specification and as per sections 1200, 1500 & 1700 of the specifications.		
	12.7.1	**Well curb**		
	12.7.1.1	RCC M20 Grade	cum	5751.00
	12.7.1.4	RCC M25 Grade	cum	5929.00
	12.7.1.7	RCC M35 Grade	cum	6015.00
	12.7.2	**Well steining**		
	12.7.2.1	PCC M15 Grade	cum	4402.00
	12.7.2.2	PCC M20 Grade	cum	4920.00
	12.7.2.3	PCC M25 Grade	cum	5325.00
	12.7.2.4	PCC M30 Grade	cum	5364.00
	12.7.2.5	RCC M20 Grade	cum	5325.00
	12.7.2.6	RCC M25 Grade	cum	5489.00
	12.7.2.7	RCC M30 Grade	cum	5364.00
	12.7.2.8	RCC M35 Grade	cum	5742.00
	12.7.3	**Bottom Plug**		
	12.7.3.1	PCC Grade M20	cum	4803.00
	12.7.3.2	PCC Grade M25	cum	5192.00
	12.7.3.3	PCC Grade M30	cum	5229.00
	12.7.3.4	PCC Grade M35	cum	5554.00
	12.7.4	**Intermediate plug**		
	12.7.4.1	PCC Grade M20	cum	4451.00
	12.7.4.2	PCC Grade M25	cum	4823.00
	12.7.4.3	PCC Grade M30	cum	4859.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	12.7.5	**Top plug**		
	12.7.5.1	PCC Grade M15	cum	4028.00
	12.7.5.2	PCC Grade M20	cum	4506.00
	12.7.5.3	PCC Grade M25	cum	4878.00
	12.7.5.4	PCC Grade M30	cum	4914.00
	12.7.6	**Well cap**		
	12.7.6.1	RCC Grade M20	cum	5131.00
	12.7.6.2	RCC Grade M25	cum	5288.00
	12.7.6.3	RCC Grade M30	cum	5364.00
12.8		Sinking well for foundation to levels as per drawing including dredging, dewatering and drop chiselling as may be necessary, including sinking by loading with necessary kentledges and other usual means for the type of work i/c all the needed plant and machinery etc. complete as directed and removal of boulders or tree trunks etc. complete as per drawing and technical specifications. *Note: Depth of sinking shall be reckoned from bed level*		
	12.8.1	**Sandy soil**		
	12.8.1.1	upto 3.0 m. depth	Cum	226.00
	12.8.1.2	Beyond 3m upto 10m depth	Cum	319.00
	12.8.1.3	Beyond 10m upto 20m depth: Add 5 percent for every additional meter depth of sinking over the rate of sinking for the previous meter.		
	12.8.2	**Beyond 20 m upto 30 m**		
	(a)	Add 7.5 percent for every additional meter depth of sinking over the rate of sinking for the previous meter.		
	(b)	Add 20 percent of cost for kentledge including supports, loading arrangement and Labour.		
	12.8.3	**Beyond 30 m upto 40 m**		
	(a)	Add 10 percent for every additional meter depth of sinking over the rate of sinking for the previous meter.		
	(b)	Add 20 percent of cost for kentledge including supports, loading arrangement and Labour.		
	12.8.3.1	upto 3.0 m. depth	cum	320.00
	12.8.3.2	Beyond 3m upto 10m depth	cum	674.00
	12.8.4	**Beyond 10m upto 20m depth**		
	(a)	Add 5 percent for every additional meter depth of sinking over the rate of sinking for the previous meter		
	(b)	Add for dewatering @ 5 percent of cost, if required.		
	12.8.5	**Beyond 20m upto 30m depth**		
	(a)	(Add 7.5 percent for every additional meter depth of sinking over the rate of sinking for the previous meter.		
	(b)	Add 5 percent of cost for dewatering on the cost, if required.		
	(c)	Add 25 percent of cost for Kentledge including supports, loading arrangement and Labour.		
	12.8.6	**Beyond 30m upto 40m depth**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	(a)	Add 10 percent for every additional meter depth of sinking over the rate of sinking for the previous meter.		
	(b)	Add 5 percent of cost for dewatering on the cost, if required.		
	(c)	Add 25 percent of cost for Kentledge including supports, loading arrangement and Labour.		
	12.8.7	**Soft Rock**		
	12.8.7.1	Depth of Soft Rock Strata upto 3m	cum	1373.00
	12.8.8	**Hard Rock**		
	12.8.8.1	Depth of Soft Rock Strata upto 3m	cum	1481.00
12.9		Sand filling in wells complete as per drawing and technical specifications as per Section 1209.	cum	2334.00
12.10		Providing steel liner 10 mm thick for curbs and 6mm thick for steining of wells including fabricating and setting out as per detailed drawing and specifications as per sections 1200 and 1900 of the specifications.	tonne	104378.00
12.11		Providing bored cast-in-situ M-35 grade R.C.C. pile (750 mm dia.) excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. and as per 1100, 1600 and 1700 of the specifications.	meter	6235.00
12.12		Providing bored cast-in-situ M-35 grade R.C.C. pile (1000 mm dia.) excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m and as per 1100, 1600 and 1700 of the specifications.	meter	9002.00
12.13		Providing bored cast-in-situ M-35 grade R.C.C. pile (1200 mm dia.) excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. and as per 1100, 1600 and 1700 of the specifications.	meter	12412.00
12.14		Providing driven cast-in-place vertical M-35 grade R.C.C. pile (750mm dia.) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	6431.00
12.15		Providing driven cast-in-place vertical M-35 grade R.C.C. piles (1000 mm dia.) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	9445.00
12.16		Providing driven cast-in-place vertical M-35 grade R.C.C. piles (1200 mm dia.) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	12299.00
12.17		Providing driven precast vertical M-35 grade R.C.C. piles (500 mm dia.) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	5873.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
12.18		Providing driven precast vertical M-35 grade R.C.C. piles (750mm dia) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	7294.00
12.19		Providing driven precast vertical M-35 grade R.C.C. piles (1000 mm dia.) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	10401.00
12.20		Providing driven precast vertical M-35 grade R.C.C. piles (300 mm x 300 mm) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	4051.00
12.21		Providing driven precast vertical M-35 grade R.C.C. piles (500 mm x 500 mm) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	5818.00
12.22		Providing driven precast vertical M-35 grade R.C.C. piles (750 mm x 750 mm) excluding reinforcement complete as per drawing and & Technical Specification and as per 1100, 1600 and 1700 of the specifications.	meter	7811.00
12.23		Driven vertical steel piles complete as per drawing and Technical Specification (Section of the pile - H Section steel column 400 x 250 mm (ISHB Series) as per 1100, 1600 and 1700 of the specifications.	meter	6501.00
12.24		Driven vertical steel piles complete as per drawing and Technical Specification (Section of the pile - H Section steel column 450 x 250 mm (ISHB Series) as per 1100, 1600 and 1700 of the specifications.	meter	7032.00
12.25		Providing and laying Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification and as per sections 1100, 1500 & 1700 of the specifications with		
	12.25.1	RCC Grade M25	cum	4956.00
	12.25.2	RCC Grade M30	cum	5032.00
	12.25.3	RCC Grade M35	cum	5196.00
	12.25.4	RCC Grade M40	Cum	5471.00
	12.25.5	RCC Grade M45	Cum	5578.00
12.26		Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications and as per Sections 1600 of the specifications.		
	12.26.1	FE 500	MT	75724.00
	12.26.2	FE 500D/ FE 550/ FE 550D	MT	80276.00
	12.26.3	FE 600	MT	82796.00
	12.26.4	Corrosion Resistant Steel	MT	84056.00
12.27		Taking exploratory boring 100 mm dia at the locations of pier and abutments or for high embankments in approaches in all type of strata as per IRC 78_1983 and Section 2400 of the specifications.		
	12.27.1	Upto 1.0 m below bed level	meter	3062.50

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	12.27.2	Beyond 1.0 m depth upto 5.0 m	meter	3202.50
	12.27.3	Beyond 5.0 m depth	meter	3341.25
12.28		Providing and laying 1.5 m deep in rock and 1.5 m above rock 25mm dia tor steel dowel bar in foundation including drilling 65mm dia bore hole in rock necessary bending, hooking tying reinforcement in position and grouting etc. complete as per drawing and specifications.	each	1509.00
12.29		Levelling course for Pile cap PCC in M-15 below Pile cap asper drawing and as per section 1100 and 1700 of the specifications.	cum	4493.00
12.30		Providing fusion Bonded Epoxy Coating (FBEC) to TMT Bars as per IS:13620-1993 specifications for a thickness of 175micron & permissible variation of 50 micron including testing of coating. Frequency of test of fusion bounded epoxy coat. a) Coating thickness shall be tested at a) frequency of not less than one full length bar every twenty bars for each size b) Continuity of coating shall be determined by testing one full length bar in every twenty bars for each size c) Coating thickness over the whole of the coated bar section shall be determined by sectioning and examining one bar in every 20t for each size. d) For testing adhesion of coating, samples shall be selected from each size according to the frequency given as: For all types of bar: Minimum 1 for every diameter or as directed by Engineer- in-Charge.		
	12.30.1	8 mm	tonne	19000.00
	12.30.2	10 mm	tonne	15000.00
	12.30.3	12 mm	tonne	13000.00
	12.30.4	16mm	tonne	10000.00
	12.30.5	20 mm	tonne	8500.00
	12.30.6	25 mm	tonne	7250.00
	12.30.7	32 mm	tonne	5750.00
12.31		Providing and fixing pressure relief pipes of 110 mm diameter of PVC as per drawing for R.C.C Raft, galleries return, abutments, wing wall etc complete.	RM	479.00
12.32		Vertical Rock Anchor for Foundation Stability including all accessories for stressing, High tensile steel wires/strands stressing operations and grouting complete as per drawing and Technical Specifications	RM	20000.00
12.33		Conducting Static Pile Test as per IS 2911 part 4 and IRC 75:2024 on Initial (2.5 tune of Design load) & Routine (1.5 tonnes of Design Load) pile, day using following methods.		
12.34		By using kentledge method as per IS 2911-part 4 clause No 7.1.3 (a) of the specifications.	MT	1100.00
12.35		By using Reaction pile method as per IS 2911-part 4 clause No 7.1.3 (b) (Including mobilized equipment) of the specifications.	MT	1150.00
12.36		By using Rock Anchor method as per IS 2911 Part 4 clause No 7.1.3(C) (Including mobilized equipment)	MT	1250.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
12.37		Conducting cyclic static load test as per IS 2911 part 4 and IRC 75 2024ON Initial & Routine pile by using following methods		
	12.37.1	By using Kentledge method	MT	1200.00
	12.37.2	By using Reaction pile method.	MT	1300.00
	12.37.3	Dynamic Pile load test Conducting Dynamic pile load test on routine pile IRC 78-2024 Appendix-6 (Part-I)	MT	350.00
	12.37.4	Directional Test Conducting pile test by using Directional method as IRC 78-2024 Appendix -07 clause no 709.2.4	MT	1500.00

CHAPTER-13

SUB-STRUCTURE FOR BRIDGES

Notes:

1. The items of this Chapter shall be governed by Section 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1900 and 2200 of the Specifications. ★

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
13.1		Brick masonry work in 1:3 (1cement :3 sand) with well burnt chimney bricks (crushing strength not less than 40kg /sqcm and water absorption not more than 15%) in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications.	cum	7428.00
13.2		Pointing with cement mortar (1:3) on brick work in substructure as per technical specifications and as per relevant clauses of sections 1300 of the specifications.	Sqm	86.00
13.3		Plastering with cement mortar (1:3) on brick work in sub-structure as per technical specifications of the specifications.	Sqm	166.00
13.4		Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications and as per Section 1400 of the specifications.		
	13.4.1	Coursed rubble masonry (First Sort)	cum	5151.00
	13.4.2	Random Rubble Masonry	cum	5346.00
13.5		Providing and laying Plain/Reinforced cement concrete in sub-structure as per drawing and technical specifications and as per Sections 1500, 1700 & 2200 of the specifications.		
	13.5.1	PCC Grade M 15	cum	4431.00
	13.5.2	PCC Grade M 20	cum	4956.00
	13.5.3	PCC Grade M 25	cum	5366.00
	13.5.4	PCC Grade M 30	cum	5405.00
	13.5.5	RCC Grade M 35	cum	5829.00
	13.5.6	RCC Grade M 40	Cum	6681.00
	13.5.7	RCC Grade M 45	Cum	6921.00
	13.5.8	RCC Grade M 50	Cum	7421.00
	13.5.9	RCC Grade M 55	Cum	7712.00
	13.5.10	RCC Grade M 60	Cum	7904.00
13.6		Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications and as per Sections 1600 of the specifications.		
	13.6.1	FE 500	MT	75724.00
	13.6.2	FE 500D/ FE 550/ FE 550D	MT	80276.00
	13.6.3	FE 600	MT	82796.00
	13.6.4	Corrosion Resistant Steel	MT	84056.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
13.8		Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC/PVC/HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing, technical specifications and as per Section 2706 of the specifications.	meter	235.00
13.9		Providing, laying and compaction Back filling behind abutment, wing wall & return wall with Granular material **(CBR>7)** complete as per drawing, technical specification and as per appendix 6 of IRC-78	cum	600.00
13.10		Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in Section 2504 specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	1489.00
13.11		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 as per Section 2000 of the specifications.	per tonne capacity	535.00
13.12		Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications and as per Section 2000 of the specifications.	Per tonne capacity	289.00
13.13		Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 complete asper drawing and approved technical specifications and as per Section 2000 of the specifications.	Per tonne capacity	178.00
13.14		Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and Section 2005 of the specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	0.87
13.15		Providing and fixing in position bituminous paper bearing for slabs as per approved drawing and confirming to IS:1398.	Sqm	53.75
13.16		Providing first class bedding below Hume pipes with granular material as per Section 2904 of the specifications.	cum	1104.00
13.17		Providing concrete cradle bedding in M-15 grade concrete as per Section 2900 and as per section 1700 and 2900 of the specifications.	cum	4303.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
13.18		Back filling behind abutment, wing wall and return wall complete as per drawing and technical specification and as per Section 305 of the specifications and as per appendix 6 of IRC-78.		
	13.18.1	Granular material	Cum	830.00
	13.18.2	Sandy material	Cum	1980.00
13.19		Extra for using M-50/ M-60 Grade Self-compacting Cement Concrete	Cum	665.00
13.20		Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications Grade M 55 in Pylon by Slipform Technique up to any Height.	Cum	11500.00
13.21		Solid Round Glass Fiber Reinforced Polymer (GFRP) bars confirming to IS: 18256:2023	Kg	207.00
		Note: This item shall be executed as a temperature/ surface reinforcement.		
13.22		Anchor bar for RCC slabs of submersible bridges Providing and fixing 20mm dia MS anchor bar duly welded at bottom with MS plate of size 500mm x 75mm x 10mm including all material labour charges etc. as per plate no. 7.22 SP- 20 or otherwise as directed by Engineer in Charge.		
	13.22.1	Fixed end anchor bar	Each	603.00
	13.22.2	Free end anchor bar	Each	1192.00
13.23		Supplying and fixing of Hot Rolled Annealed & pickled stainless steel chequered plate having flat bottom of Grade 409M confirming to IS:6911-2017 Amendment 2 Pattern as per IS: 3502 1A, bead height minimum 0.80mm for pathway, staircase, floor for the bridge including fixing the same over channels by drilling holes in channels etc. including supply and fixing of nuts & bolts, tools & plants, labour, lead including ascend/descend complete in all respect.		
	13.23.1	3 mm thickness	Sqm	4122.00
	13.23.2	4 mm thickness	Sqm	5394.00
	13.23.3	6 mm thickness	Sqm	7905.00
	13.23.4	8 mm thickness	Sqm	10432.00
	13.23.5	10 mm thickness	Sqm	12638.00
	13.23.6	12 mm thickness	Sqm	15488.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
13.24		Providing and fixing Acoustic Noise Barrier System absorptive type panels having tongue and groove for panel interlocking with total thickness of panels is 95±10 mm Panel shall be made of galvanized sheet with thickness not less than Imm. Front side of the panel shall be perforated while the back side shall remain plain. Composite panels are made of 90+10 mm thick rockwool with density of 90±10 kg/m3 and surface is over laid with glass veil/fibre glass tissue on perforated side. Powder Coating shall be done as per approved shade. Panel shall be erected between vertical post ISMB 125x125 with base plate 200x1200x12mm at high level bridge and at Embankment location the vertical post ISMB 150X150 with base plate 300x300x12mm, anchor bolts of 16mm dia including red oxide and oil paint. The Rockwool shall be provided by the hardcore manufacturer of acoustic noise barrier system. This item shall be executed as per IRC SP 130-2022.		
	13.24.1	At embankment level with minimum 3 m height	Sqm	9800.00
	13.24.2	A High-level Bridge/Elevated corridor with minimum 2 m height	Sqm	10800.00
13.25		Supplying Stainless Steel Hot Rolled Annealed Pickled Plates 350N/mm2 designated IRS 350 CR similar to RDSO Specifications BS-S 7.5.3.1-9 for the Structural application, ASTMA 1010/ A1010M-01E1 and Indian Standard (IS) 6911-2017 amendment 2 having chemical properties of C 0.03% Max, Mn1.5%, Si 1% max., 5 0.01% max., P 0.04% max., Ni 1.5% max, Mo 0.10-0.75% min., Cr 10.5%- 12.5%, N 0.03% max & mechanical properties 0.2% proof Stress 350MPA min, Ultimate Tensile Strength 485 MPA min% Elongation 18min, inclusive of all necessary testing & certification	MT	175852.00
13.26		Supplying Stainless Steel Hot Rolled Annealed Pickled Plates 450N/mm2 designated IRS 450 CR similar to RDSO Specifications BS-S 7.5.3.1-9 for the Structural application, ASTMA1010/A1010M-01E1 and Indian Standard (IS) 6911-2017 amendment 2 having chemical properties of C 0.03%Max, Mn1.5%, Si 1% max., S 0.01% max., P 0.04% max., Ni 1.5% max, Mo 0.10 0.75% min., Cr 10.5%- 12.5%, N 0.03% max & mechanical properties 0.2% proof Stress 450MPA min, Ultimate Tensile Strength 585 MPA min% Elongation 18min, inclusive of all	MT	196523.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
13.27		Providing, fabricating, detailing and fixing at desired location using Stainless Steel Hot Rolled Annealed Pickled Plates 350N/mm2 designated IRS 350 CR similar to RDSO Specifications BS-S 7.5.3.1-9 for the Structural application, ASTMA1010/A1010M-01E1 and Indian Standard (IS) 6911-2017 amendment 2 having chemical properties of C 0.03% Max, Mn 1.5%, Si 1% max., S 0.01% max., P 0.04% max., Ni 1.5% max, Mo 0.10-0.75% min., Cr 10.5%- 12.5%, N 0.03% max & mechanical properties 0.2% proof Stress 350MPA min, Ultimate Tensile Strength 485 MPA min, Elongation 18% min. Inclusive of all fabrication charges, consumables, lifting and handling, shop/fabrication drawings, testing and certification, transportation to site, erection at all heights and levels, and provision of necessary bolts, nuts, washers, cleats, stiffeners, gussets, base plates, and all required fixtures and operations including preheating, straightening, bending, cutting, drilling, grinding, machining, welding, and finishing as per specifications, complete as directed by the Engineer-in-Charge.”.	MT	389758.00
13.28		Providing, fabricating (including fabrication charges with all consumables, lifting and handling machinery, electricity, de-stressing of plates, temporary assembly, etc.), detailing (preparation of shop/fabrication drawings for each section from approved GFC drawings) and fixing at the desired location stainless steel hot-rolled annealed pickled plates (450 N/mm² IRS 450 CR or equivalent as per RDSO/BS/ASTM/IS 6911-2017 Amendment 2) with chemical properties: C 0.03% max, Mn 1.5%, Si 1% max, S 0.01% max, P 0.04% max, Ni 1.5% max, Mo 0.10–0.75% min, Cr 10.5–12.5%, N 0.03% max; mechanical properties: 0.2% proof stress 450 MPa min, ultimate tensile strength 585 MPa min, elongation 18% min, including all necessary testing and certification, complete with transportation to site (loading/unloading), and erection of structural stainless steel members at all heights, complete as per drawings and specifications.	MT	402662.00

CHAPTER-14

SUPER-STRUCTURE FOR BRIDGES

Notes:

1. The items of this Chapter shall be governed by Section 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800,1900 and 2300 of the Specifications.★

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
14.1		Providing and laying Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification and as per Sections 1500, 1700 and 2300 of the specifications.		
	14.1.1	**RCC Grade M20 with 20 mm maximum size of aggregate**		
		Using Concrete Mixer		
	14.1.1.1	**For solid slab super-structure**		
	i.	Height upto 5m	cum	5745.00
	ii.	Height beyond 5m and upto 10m	cum	5984.00
	iii.	Height above 15m	cum	6463.00
	14.1.1.2	**For T-beam & slab**		
	i.	Height upto 5m	cum	6223.00
	ii.	Height beyond 5m and upto 10m	cum	6463.00
	iii.	Height above 10m	cum	6702.00
	14.1.2	**RCC Grade M25 with 20 mm maximum size of aggregate**		
	14.1.2.1	**For solid slab super-structure**		
	i.	Height upto 5m	cum	5938.00
	ii.	Height beyond 5m and upto 10m	cum	6176.00
	iii.	Height above 10m	cum	6413.00
	14.1.2.2	**For T-beam & slab**		
	i.	Height upto 5m	cum	6176.00
	ii.	Height beyond 5m and upto 10m	cum	6413.00
	iii	Height above 10m	cum	6651.00
	14.1.3	**RCC Grade M 30 with 20 mm maximum size of aggregate**		
	14.1.3.1	**For solid slab super-structure**		
	i.	Height upto 5m	cum	6030.00
	ii.	Height beyond 5m and upto 10m	cum	6271.00
	iii	Height above 10m	cum	6513.00
	14.1.3.2	**For T-beam & slab**		
	i.	Height upto 5m	cum	6271.00
	ii.	Height beyond 5m and upto 10m	cum	6513.00
	iii	Height above 10m	cum	6754.00
	14.1.4	**RCC/PSC Grade M35 with 20 mm maximum size of aggregate**		
	14.1.4.1	**For solid slab super-structure**		
	i.	Height upto 5m	cum	6129.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	ii.	Height beyond 5m and upto 10m	cum	6379.00
	iii	Height above 10m	cum	6628.00
	14.1.4.2	**For T-beam & slab**		
	i.	Height upto 5m	cum	6379.00
	ii.	Height beyond 5m and upto 10m	cum	6628.00
	iii	Height above 10m	cum	6877.00
	14.1.5	**For box girder and balanced cantilever**		
	i.	Height upto 5m	cum	7126.00
	ii.	Height beyond 5m and upto 10m	cum	7624.00
	iii	Height above 10m	cum	8123.00
	14.1.6	**PSC Grade M-40 with 20 mm maximum size of aggregate**		
	14.1.6.1	**For solid slab super-structure**		
	i.	Height upto 5m	cum	6455.00
	ii.	Height beyond 5m and upto 10m	cum	6718.00
	iii	Height above 10m	cum	6980.00
	14.1.6.2	**For T-beam & slab**		
	i.	Height upto 5m	cum	6718.00
	ii.	Height beyond 5m and upto 10m	cum	6980.00
	iii	Height above 10m	cum	7243.00
	14.1.7	**PSC Grade M-45 with 20 mm maximum size of aggregate**		
	14.1.7.1	**For solid slab/voided slab super-structure**		
	i.	Height upto 5m	cum	6476.00
	ii.	Height beyond 5m and upto 10m	cum	6744.00
	iii	Height above 10m	cum	7011.00
	14.1.7.2	**For T-beam & slab including launching of precast girders by launching truss upto 40 m span**		
	i.	Height upto 5m	cum	6744.00
	ii.	Height beyond 5m and upto 10m	cum	7011.00
	iii	Height above 10m	cum	7279.00
	14.1.8	**For cast-in-situ box girder, segmental construction and balanced cantilever**		
	i.	Height upto 5m	cum	7547.00
	ii.	Height beyond 5m and upto 10m	cum	8082.00
	iii	Height above 10m	cum	8617.00
	14.1.9	**PSC Grade M-50 with 20 mm maximum size of aggregate**		
	14.1.9.1	**For cast-in-situ box girder, segmental construction and balanced cantilever**		
	i.	Height upto 5m	cum	8040.00
	ii.	Height beyond 5m and upto 10m	cum	8614.00
	iii	Height above 10m	cum	9189.00
	14.1.10	**PSC Grade M- 55 with 20 mm maximum size of aggregate for cast-in-situ box girder, segmental construction and balanced cantilever**		
	i.	Height upto 5m	cum	8163.00
	ii.	Height beyond 5m and upto 10m	cum	8746.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	iii	Height above 10m	cum	9330.00
14.2		Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications.		
	14.2.1	FE 500	MT	75724.00
	14.2.2	FE 500D/ FE 550/ FE 550D	MT	80276.00
	14.2.3	FE 600	MT	82796.00
	14.2.4	Corrosion Resistant Steel	MT	84056.00
14.3		Providing High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and technical specifications.	tonne	160699.00
14.4		Providing and laying Cement concrete wearing coat M-30 grade including cost of reinforcement complete as per drawing and Technical Specifications and as per Sections 1500, 1700 and Clause 2702 of the specifications.	cum	11563.00
14.5		Construction of precast RCC railing of M30 Grade aggregate size not exceeding 12 mm, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specification and as per Sections 1500, 1600, 1700 and 2703 of the specifications (as per MoRTH standard drawing **SD/202** or **SD/305**).	meter	1997.00
14.6		Construction of RCC railing of M30 Grade in-situ with 12 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.	meter	1936.00
14.7		Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification and as per Section 1900 and 2700 of the specifications.	meter	3730.00
14.8		Providing & fitting 100mm dia Galvanised steel Drainage Spouts complete as per Section 2705 of the specifications & as directed by the Engineer.	Each	4299.00
14.9		Providing PCC M15 (with 40 mm maximum size of aggregate) Grade levelling course below approach slab complete as per drawing and technical specification and as per relevant Sections of Section 1700 of the specifications.	cum	4046.00
14.10		Providing and laying Reinforced cement concrete approach slab in M-30 grade concrete including formwork excluding cost of reinforcement complete as per drawing and technical specification.	cum	5927.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
14.11		Providing and laying a buried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised weldable structural 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, all as specified in the specifications.	meter	7227.00
14.12		**Filler joint**		
	14.12.1	Providing & fixing 2 mm thick and 200mm wide corrugated copper plate in expansion joint complete as per drawing & Technical Specifications.	meter	4454.00
	14.12.2	Providing & fixing 20 mm thick & 25cm deep compressible fibre board in expansion joint complete as per drawing & Technical Specifications.	meter	296.00
	14.12.3	Providing and fixing in position 20 mm thick & 300mm deep pre moulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.	meter	160.00
	14.12.4	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight.	meter	38.00
14.13		Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of wieldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/backer rod, all as per approved drawings and specifications and as per Section 2600 of the specifications.	meter	1443.00
14.14		Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm. and as per specifications.	meter	6123.00
14.15		Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.	meter	12426.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
14.16		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 instructions for installation.	meter	6367.00
14.17		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 the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions.	meter	15522.00
14.18		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 manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions.	meter	16758.00
14.19		Testing of span of bridge for deflection due to live load with platforms for loading arrangements, apparatus for measurements including unloading etc complete as per approved drawing and as directed by Engineer.	MT	1018.75
14.20		Providing and applying one coat of solvent-based silane-siloxane primer followed by two coats of solvent-based thermoplastic aliphatic anti-carbonation paint on concrete surfaces for protection against carbonation distress, complete as per specifications.	Sqm	185.00
14.21		**High Performance Concrete:**		
		Providing and placing High Performance concrete in super-structure ex/c reinforcement as per drawing and technical specifications as per Section 1500,1700 and 2300 as well as confirming to provision in IRC: SP 70-2016		
	14.21.1	M 70	Cum	7293.00
	14.21.2	M 80	Cum	7958.00
	14.21.3	M 90	Cum	8623.00
14.22		**Ultra High-Performance Concrete**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Casting special grade UHPFRC-Ultra High-Performance fibre reinforced concrete M150 in controlled environment by maintaining room temperature to the ambient temperature by executing casting work in factory shed with air ventilation. AC and by providing chilling plant with concrete mixture capacity of 12 cum to maintain the homogeneity along the concrete required for 1 segment of Trapezoidal shape segment of specified length for Navigational span at precast casting yard along with the provision of steam curing. Casting machineries such as casting mould survey software, overhead pantries, ancillary civil work such as gentry wall of 400 M. Stacking bed to stack 240 segments, curing water tank, survey tower, reinforcement jig, Overhead gantry of 80 MT of 25 mtr span. Overhead Gantry of 15 MT of 25 mtr span, Diesel genset of 250 KVA, welding machine, steel cutting, bending machines. concrete pump/ Boom placer concrete bucket with type mounted cranes etc and stacking yard to complete the entire casting of U girders withing 6-month duration. including transportation in position complete.	Cum	125000.00
14.23		Solid Round Glass Fibre Reinforced Polymer (GFRP) Bars for Concrete Reinforcement. Supplying, fitting & placing GFRP (Glass fibre Reinforced Polymer) bars conforming to IRC 137:2022 for structures such as Crash Barriers, Concrete drains, Concrete pavements, Approach slabs as per drawing & technical specification. (Only GFRP Bars manufactured using Vinyl Ester Resin systems and Glass fibres classified as E-CR or R that meet the requirements of IS: 18256:2023 and ASTM D578 shall be used.) *Note: This item shall be executed as a temperature/ surface reinforcement*	Kg	207.00
14.24		**Cable and suspension Superstructure**		
		The work includes the supply, fabrication, installation, monitoring, and multi-stage stressing/prestressing of stay cables using a parallel strand system with 15.2 mm diameter strands and a guaranteed ultimate tensile strength (GUTS) of 1860 MPa. The stay cables shall be cut and placed in the specified profiles to provide permanent deck support. The scope also includes:- Installation of high-density polyethylene (HDPE) sheathing ducts.- Fixing live anchorages at the deck and dead anchorages at the pylon, with steel anchor boxes embedded in the pylon as per approved drawings.- Completion of all works in accordance with detailed drawings and technical specifications - Recess filling with approved materials and application of protective coating and wax after tensioning.- Recording and reporting of tensioning data.- Proper treatment of the projected strand ends after anchoring and covering them with specified materials. Health monitoring using a magnetic flux system with online operation and maintenance for 10 years. Testing of materials, including fatigue testing, to ensure compliance with specifications.	MT	1600000.00
14.25		**Structural Steel Work for Bridge Superstructure**		

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
		Providing and installing structural steel work for the superstructure of bridges, including Bow String, Composite Girder, Semi-Through Girder, and Plate Girder types. The work involves cutting, riveting, bolting, or welding, as well as launching with the necessary lifting arrangements, in accordance with the approved design. It also includes hoisting into position and completing all associated tasks. Metallizing of steel girders shall be carried out by spraying aluminium after surface preparation through sand/grit blasting. This process will be followed by: ▪ One coat of etch primer (IS: 5666) ▪ One coat of zinc chrome primer (IS:104) ▪ Two coats of aluminium paint (IS:2339) All work shall include labour, tools, plants (T&P), and materials, ensuring compliance with relevant specifications and procedures as per Clause 39 of IRS-B1-2001.		
		Coating Specifications: ▪ Nominal thickness of sprayed aluminium coating:150 microns ▪ Dry film thickness (DFT) of zinc chrome primer: 25-30microns ▪ DFT of each coat of aluminium paint: 12-14 microns The structural steel shall conform to Grade Designation E250, with Quality B0 as per IS: 2062, in accordance with Section 1900 of the specifications. Note: The rate for the deck slab shall be as per RCC/PSC T-Beam and slab specifications.		
	14.25.1	Bow string	MT	140000.00
	14.25.2	Composite Girder	MT	125000.00
	14.25.3	Extra for providing steel grade E 350 in place of E 250	MT	4910.00
		Note: - (for deck slab rate as per RCC/PSC T Beam and slab)		
14.26		Add Extra for providing anti-corrosive treated HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC).	tonne	6672.00
14.27		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 after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005 cum per 10 Sqm and at an approximate spacing of 10 cm centre to centre in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per Section 515 of the specifications.	Sqm	818.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
14.28		Reinforced cement concrete non-structural approach slab (Grade of concrete M 30) as per MoRT&H standard drawing including reinforcement and formwork complete as per drawing and technical specification and as per Sections 1500, 1600, 1700 and 2704 of the specifications.	cum	6672.00
14.29		Providing and fixing Helical pipes, Galvanised steel sheet metal in voided concrete slabs including 20mm dia tie rod and sealing joints etc. as per Section 1700 and 1800 of the specifications.		
	14.29.1	550 mm dia	Meter	1987.00
	14.29.2	600 mm Dia.	Meter	2144.00
	14.29.3	800 mm dia	Meter	2446.00
14.30		Providing, fixing and erecting 40 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 0.95 metres high above ground, 1.8 m centre to centre, complete as per approved drawings.	metre	1663.00
14.31		Providing and Fixing Polycarbonate Noise Barrier having solid Polycarbonate sheet thickness not less than 8 mm shall be UV stable, weather resistant, sound insulation shall not be less than 32 dB and meets the requirement of ZTV-LSW06, EN 1793 and EN 1794. Sheet shall be fixed with steel channel of steel I-section 92x104mm, height-2.0 m Z-frame with EPDM Rubber Gasket. The whole assembly shall be fixed with MS Base plate size 220x220x16mm with 4 numbers anchor fastener- M16x250 Each Z- frame shall have spacing of 2.0 m which should be grouted with Epoxy. Steel work shall be well painted with primer etc. as per the direction of Engineer-in-Charge.	Sqm	13775.00
14.32		Providing and Fixing Polycarbonate Noise Barrier having solid Polycarbonate sheet thickness not less than 8 mm shall be UV stable, weather resistant, sound insulation shall not be less than 32 dB and meets the requirement of ZTV-LSW06, EN 1793 and EN 1794. Sheet shall be fixed with steel square hollow section having vertical member 60x60x3.2 mm and horizontal member 40x40x2.6 mm, height 2.0 mtr polycarbonate sheet fixed with EPDM gasket. The whole assembly shall be fixed with MS Base plate size 250x220x12 mm with 4 numbers anchor fastener- M16x150. Steel work shall be well powder coated etc. as per the direction of Engineer-in-Charge.	Sqm	13447.00

CHAPTER-15

RIVER TRAINING AND PROTECTION WORKS

Notes:

1. The items of this Chapter shall be governed by Section 2500 of the Specifications.★

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
15.1		Providing and laying of a **Gabion Structure for retaining earth** with segments of wire crates of size upto 7.5 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 MPa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire) and as per specification in section 2500 of the specifications.	cum	1627.00
15.2		Providing and laying **Gabion Structure for erosion control**, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 MPa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire.) and as per specification in Section 2500 of the specifications.	cum	2470.00
15.3		Providing and laying of **Apron with Cement Concrete Blocks** of size 0.5x0.5x0.5 m and made with nominal mix of M-15 grade cement concrete with a minimum cement content of 250 kg/cum as per IRC: 21-2000 and as per Section 2500 of the specifications.	cum	4463.00
15.4		Providing and laying **Rubble Stone/Cement Concrete Flooring** complete as per drawing and technical specifications laid over cement concrete bedding and as per Section 1400, 1700 & 2500 of the specifications.		
	15.4.1	Rubble stone laid in cement mortar 1:3	cum	5586.00
	15.4.2	Cement Concrete Grade M15	cum	6171.00
15.5		Providing and laying **Pitching on Slopes** laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and technical specifications and as per Section 2500 of the specifications.		
	15.5.1	Stone/Boulder (min. wt. 40 Kg)	cum	2036.00
	15.5.2	**Cement Concrete blocks** of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15	cum	4463.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
15.6		Providing and laying **Filter Material** underneath pitching in slopes complete as per drawing and technical specification and as per Section 2500 of the specifications	cum	1769.00
15.7		**Geotextile Filter**		
		Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching, and as per Section 700 of the specifications.	sqm	229.00
15.8		Providing **Curtain Wall** complete as per drawing and technical specification and as per Section 1400, 1700 and 2500 of the specifications.		
	15.8.1	Coarse Rubble Stone masonry in cement mortar (1:3)	cum	6591.00
	15.8.2	Cement concrete Grade M15	cum	3938.00
15.9		Providing and laying **Boulders Apron on River Bed** for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and technical specification.		
		A-Boulder laid dry without wire crates.	cum	2389.00
15.10		Providing and laying of **Boulder Apron laid in Wire Crates** made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10 per cent extra for laps and joints laid with stone boulders weighing not less than 40 kg each.	cum	2425.00
15.11		Providing & making **Gabion Structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh** Gabion Boxes as per IS 16014:2012, Section 2500 of the specifications in required size, Mesh Type 10x12 (D=100 mm with tolerance of ± 2%) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedge with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-Charge.	cum	2798.00
15.12		Laying of a fine aggregate concrete grade **M30 Filled Fabric Form** for erosion protection of embankments (Embankment Erosion Protection using Fine Aggregate Concrete Filled Fabric Form Mattress system).	cum	4362.30

CHAPTER-16

REPAIR AND REHABILITATION FOR ROADS AND BRIDGES

Notes:

1. The items of this Chapter shall be governed by all the chapters of specifications.
2. This chapter is dealing in major and minor repairs and rehabilitation of roads.

Schedule of Rates

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
16.1		Removal of existing cement concrete wearing coat including its disposal complete as per technical specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000m (Thickness 75 mm) .	sqm	113.00
16.2		Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt including disposal with all lift and lead up to 1000m.	sqm	86.00
16.3		Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per technical specification and as per Section 2800 of the specifications.		
	16.3.1	Cement Mortar (1:1) for sealing of cracks	Kg	158.00
	16.3.2	Cement Grout for injection	kg	164.00
16.4		Providing and Applying (10mm thick Average) epoxy mortar (including primer & seal coat) over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per technical specification.	sqm	4075.00
16.5		Patching of damaged concrete surface, (25 mm thick average) with polymer modified cementitious mortar to be applied as per instructions of manufacturer and as approved by the Engineer.	Sqm	2248.00
16.6		Guniting concrete surface with 25 mm thick (Average) cement mortar 1:3 applied with compressor after cleaning surface and spraying with epoxy complete as per technical specification and as per Section 2800 of the specifications.	sqm	1040.00
16.7		Removal of defective concrete (40 mm thick average) cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per Section 2807 of the specifications, sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 MPa and workmanship conforming to Section 2807 of the specifications.	sqm	354.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
16.8		Providing and applying polymer modified cementious (PMC) mortar proportion as per manufacturer recommendation flush pointing on stone masonry structures including raking of joints necessary scaffolding etc. complete.	Sqm	475.00
16.9		Providing and applying Epoxy bonding of new concrete to old concrete @ 8.00 Kg/10 sqm min. as per section 2805 of the specifications.	sqm	583.00
16.10		Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.	sqm	2154.00
16.11		Sealing of crack/porous concrete with Epoxy Grout by injection through nipples complete as per section 2803 of the specifications.	kg	1586.00
16.12		Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per technical specification	Sqm	388.00
16.13		Providing and laying in situ/ready mix M35 grade RCC jacketing work around the existing piers of bridges etc. complete. (With fully automatic microprocessor-based PLC with SCADA enabled concrete batch mix plant/pan mixer with fine aggregates of required specification (VSI sand finely washed etc.) height of 8 to 10 meter)	cum	7734.00
16.14		Applying pre-packed cement- based polymer mortar of strength 45MPa at 28 days for replacement of spalled concrete	Sqm	177.00
16.15		Supply, Drilling/ Cleaning Hole and injecting ETA approved RE 500 V3 chemical excluding reinforcement.	Nos.	421.00
16.16		Providing and fixing of carbon fibre sheet of 430 GSM with adhesive including of hanging scaffolding of all manpower and equipment's complete in all respect.	Sqm	8986.00
16.17		Strengthening structural elements by providing & fixing CARBON FIBER surface preparation: Griding concrete substrate, cleaning it with wire brush removing oil, laitance if present, rounding sharp edges to min 25 mm radius etc. complete. Profiling: providing & Applying compatible Embrace primer on prepared substrate, Filling the holes and uneven surface with high strength epoxy putty etc. complete IF required. Wrapping: Providing & Applying first coat of saturant, cutting the carbon fibre sheet to size, wrapping the fibre sheet to structural element at desired orientation using tamping roller to avoid and air voids etc. complete Sand Pasting: Providing & Applying second coat of saturant after min. 12 hrs. rectify air voids if any paste the rive sand on it to make surface rough to take any further finishes (Mode of measurement: Per sq.mt of Embrace CF 400 sheet applied and not surface area of concrete application & Quantity will be measured including wastage) The rate includes all type of material, application, equipment & scaffolding etc. complete, Rate is applicable for all height & level. *Note: This item shall be executed only with the written permission from E-in-C UADD.*	sqm	6260.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
16.18		Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and technical specification. *Note: This item shall be executed only with the written permission from E-in-C UADD.*	tonne	351714.00
16.19		Lifting of super-structure of bridge for resetting if required/refixing of new bearings including removal of old bearings and including all higher and running expenses of all plants, jacks, machines and equipment's temporary supports, required for keeping the super- structure in lifted position for completing the operation, lowering of super-structure on bearings, without causing any detrimental effect to any part of the bridge structure complete but excluding cost of replaced bearings. *Note: This item shall be executed only with the written permission from E-in-C UADD.*		
	16.19.1	Span upto 20m	Per Span	62590.00
	16.19.2	Span beyond 20m and upto 30m	Per Span	75790.00
	16.19.3	Span beyond 30m	Per Span	88990.00
16.20		Replacement of expansion Joint complete as per drawing. Cost of expansion joint to be paid separately.	RM	2241.00
16.21		Removal and refixing of existing Pipe railing before and after rains including transportation of material from bridge to store place which is provided by the department as per under guidance of department.	RM	200.00
16.22		In situ Soil Reinforcement for Slope Restoration (Soil Nailing) Designing, Providing drawings and installation of fully threaded (only Milled or Hot thread bars are allowed to avoid any loss of strength), Hot-dip galvanized solid geotechnical bars as soil nail having yield strength ≥ 670 MPa, ultimate tensile strength ≥ 800 MPa and minimum galvanization of 500 g/m2 required for construction of soil nailed stabilized slope including supply of galvanized nail plates, dome shape nuts, tapper washer, coupler (if required), centralizer and all accessories, including all lead and lifts as per detailed specification (Conforming to BS 8006 & AFNOR standards).		
	16.22.1	20 mm dia	metre	2651.00
	16.22.2	25 mm dia	metre	2778.00
	16.22.3	28 mm dia	metre	2905.00
	16.22.4	32 mm dia	metre	3095.00
	16.22.5	35 mm dia	metre	3349.00
16.23		Replacement of damaged concrete railing	metre	303.00
16.24		Replacement of crash barrier	metre	582.00
16.25		Replacement of damaged mild steel railing	metre	247.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
16.26		Repair of crash barrier (Repair of concrete crash barrier with cement concrete of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work.)	metre	193.00
16.27		Repair of RCC Railing (Carrying out repair of RCC M30 railing to bring it to the original shape).	metre	249.00
16.28		Repair of steel Railing (Repair of steel railing to bring it to the original shape).	metre	45.00

CHAPTER 17
CULVERTS, BOX CELL AND PRE-CAST DRAINS

Notes:

1. This Chapter shall be generally governed by all the chapters of specifications with special emphasis on Section 2900.

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
17.1.		**PCC M-15 in Foundation:** Plain cement concrete M-15 mix with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days as per Section 409 of the specifications.	cum	3784.00
17.2		Providing concrete cradle bedding in M-15 grade concrete as per clause 2900 and as per section 1700 and 2900.	cum	4225.00
17.3		Deduction for not providing the first-class bedding (in case sand is available in the bed or the concrete craddle is provided as per item 17.6 above) in item No.17.2., 17.3, 17.4 above.	cum	565.40
17.4		Providing P.C.C. M-15 Nominal mix for Hume pipe culverts in foundation and sub structure etc. as per drawing and as per Section 1500, 1700, 2100 and 2900 of the specifications.	cum	5078.70
17.5		Providing and placing in position precast reinforced cement concrete U-shape drain as per design and shape, using coarse aggregate and fine aggregate derived from natural sources, Ordinary Portland cement, admixtures as per IS: 456-2000 and standard like India standard, international standards viz. Japanese Industrial Standards (JIS)/ US standard/EU standard/ having of strength not less than M-50. Using Thermo- Mechanically Treated bars. (TMT/TMX) FE 500D or more conforming to IS 1786 reinforcement bar (minimum 95 kg per cum) and capable of carrying a wheel load of min 25 Tones for heavy vehicle movement. Rate includes all cost of material, labour charges at the plant, cost of reinforcement, formwork and lifting accessories, and transportation upto work at the site. making necessary holes of required sizes for carrying through service lines etc., providing steel hooks for lifting, etc. the work to be executed as per the direction of Engineer in- charge.		
	17.5.1	Pre-Cast U Shape Drain 300x300mm wall thick.70 mm	RM	2931.00
	17.5.2	Pre-Cast U Shape Drain 450x450 mm wall thick.80 mm	RM	4485.00
	17.5.3	Pre-Cast U Shape Drain 600x600 wall thick. 90 mm	RM	5512.00
	17.5.4	Pre-Cast U Shape Drain 750x750 mm wall thick.100 mm	RM	6743.00
	17.5.5	Pre-Cast U Shape Drain 900x900 mm wall thick.120 mm	RM	8418.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	17.5.6	Pre-Cast U Shape Drain – 1200x1200 mm wall thick.120 mm	RM	10439.00
17.6		Providing and placing in position precast reinforced cement concrete U-shape drain as per design and shape, using coarse aggregate and fine aggregate derived from natural sources, Ordinary Portland cement, admixtures as per IS: 456-2000 and standard like India standard, international standards viz. Japanese Industrial Standards (JIS)/ US standard/EU standard/ having of strength not less than M-50. Using Thermo- Mechanically Treated bars. (TMT/TMX) FE 500D or more conforming to IS 1786 reinforcement bar (minimum 95 kg per cum) and capable of carrying a wheel load of min 5 Tones for heavy vehicle movement. Rate includes all cost of material, labour charges at the plant, cost of reinforcement, formwork and lifting accessories, and transportation upto work at the site. making necessary holes of required sizes for carrying through service lines etc., providing steel hooks for lifting, etc. the work to be executed as per the direction of Engineer in- Charge.		
	17.6.1	Pre-Cast U Shape Drain 300x300mm Wall Th 70 mm	RM	2943.00
	17.6.2	Pre-Cast U Shape Drain 450x450 mm Wall Th 80 mm	RM	3604.00
	17.6.3	Pre-Cast U Shape Drain 600x600 Wall Th 90 mm	RM	5028.00
	17.6.4	Pre-Cast U Shape Drain 750x750 mm Wall Th 100 mm	RM	5961.00
	17.6.5	Pre-Cast U Shape Drain 900x900 mm Wall Th 120 mm	RM	7741.00
17.7		Providing and fixing factory-made precast RCC-U-shape drain, drain covers, having of strength not less than M-50, using Thermo- Mechanically Treated bars. (TMT/TMX) FE 500D or more conforming to IS 1786 reinforcement bar (minimum 95 kg per cum) and capable of carrying a wheel load of 25.0 Tones for heavy vehicle movement, of size Lid for U-300x300 mm. As per standard size reinforced with 8 mm dia main longitudinal & 6 mm no's cross- sectional TMT hoop bars, including providing 50 mm dia perforations @ 2 nos. including providing edge binding with M.S. flats of size 50 mm x 1.80 mm complete, all as per direction of Engineer-in-Charge.		
	17.7.1	Pre-Cast RCC U Shape drain Lid for U-300x300 mm	each	2931.00
	17.7.2	Pre-Cast RCC U Shape drain Lid for U-450x450 mm	each	4485.00
	17.7.3	Pre-Cast RCC U Shape drain Lid for U-600x600 mm	each	5512.00
	17.7.4	Pre-Cast RCC U Shape drain Lid for U-750x750 mm	each	6743.00
	17.7.5	Pre-Cast RCC U Shape drain Lid for U-900x900 mm	each	8418.00
	17.7.6	Pre-Cast RCC U Shape drain Lid for U-1200x1200 mm	each	10439.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
17.8		Providing and fixing factory-made precast RCC U-shape drain (FUJI) drain covers, having of strength not less than M-50 using Thermo-Mechanically Treated bars (TMT/TMX) FE 500D or more conforming to IS 1786 reinforcement bar (minimum 95 kg per cum) and capable of carrying a wheel load of 5.0 Tones for heavy vehicle movement, of size Lid for U-300x300 mm. As per standard size reinforced with 8 mm dia main longitudinal & 6 mm no's cross- sectional TMT hoop bars, including providing 50 mm dia perforations @ 2 nos. including providing edge binding with M.S. flats of size 50 mm x 1.60 mm complete, all as per direction of Engineer-in-Charge.		
	17.8.1	Pre-Cast U Shape Drain Cover 300x300 mm	RM	2171.00
	17.8.2	Pre-Cast U Shape Drain Cover 450x450 mm	RM	2614.00
	17.8.3	Pre-Cast U Shape Drain Cover 600x600 mm	RM	3087.00
	17.8.4	Pre-Cast U Shape Drain Cover 750x750 mm	RM	3521.00
	17.8.5	Pre-Cast U Shape Drain Cover 900x900 mm	RM	3808.00
17.9		Providing and placing in position precast reinforced cement concrete Flume as per design and shape, using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/ Ordinary Portland/ Portland Slag cement, admixtures in recommended proportions as per IS: 456-2000 and standard like India standard, international standards viz. Japanese Industrial Standards (JIS)/ US.		
	17.9.1	**PRE-CAST FLUME HEIGHT 900MM (Minimum reinforcement 95 kg per Cum)**		
	17.9.1.1	Storm Water Drain (900x600) MM	RM	8361.00
	17.9.1.2	Storm Water Drain (900x700) MM	RM	8607.00
	17.9.1.3	Storm Water Drain (900x800) MM	RM	8912.00
	17.9.1.4	Storm Water Drain (900x900) MM	RM	9158.00
	17.9.1.5	Storm Water Drain (900x1000) MM	RM	9404.00
	17.9.1.6	Storm Water Drain (900x1100) MM	RM	9690.00
	17.9.1.7	Storm Water Drain (900x1200) MM	RM	9888.00
	17.9.1.8	Storm Water Drain (900x1300) MM	RM	10139.00
	17.9.1.9	Storm Water Drain (900x1400) MM	RM	10449.00
	17.9.1.10	Storm Water Drain (900x1500) MM	RM	11755.00
	17.9.1.11	Storm Water Drain (900x1600) MM	RM	12026.00
	17.9.1.12	Storm Water Drain (900x1700) MM	RM	12297.00
	17.9.1.13	Storm Water Drain (900x1800) MM	RM	12569.00
	17.9.2	**PRE-CAST FLUME HEIGHT 1200MM (Minimum reinforcement 95 kg per Cum)**		
	17.9.2.1	Storm Water Drain (1200x700) MM	RM	10687.00
	17.9.2.2	Storm Water Drain (1200x800) MM	RM	11045.00
	17.9.2.3	Storm Water Drain (1200x900) MM	RM	11291.00
	17.9.2.4	Storm Water Drain (1200x1000) MM	RM	11538.00
	17.9.2.5	Storm Water Drain (1200x1100) MM	RM	11784.00
	17.9.2.6	Storm Water Drain (1200x1200) MM	RM	12030.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	17.9.2.7	Storm Water Drain (1200x1300) MM	RM	12378.00
	17.9.2.8	Storm Water Drain (1200x1400) MM	RM	12687.00
	17.9.2.9	Storm Water Drain (1200x1500) MM	RM	12939.00
	17.9.2.10	Storm Water Drain (1200x1600) MM	RM	13191.00
	17.9.2.11	Storm Water Drain (1200x1700) MM	RM	13442.00
	17.9.2.12	Storm Water Drain (1200x1800) MM	RM	13747.00
	17.9.2.13	Storm Water Drain (1200x1900) MM	RM	15274.00
	17.9.2.14	Storm Water Drain (1200x2000) MM	RM	15629.00
	17.9.2.15	Storm Water Drain (1200x2100) MM	RM	15900.00
	17.9.2.16	Storm Water Drain (1200x2200) MM	RM	16172.00
	17.9.2.17	Storm Water Drain (1200x2300) MM	RM	16496.00
	17.9.2.18	Storm Water Drain (1200x2400) MM	RM	16768.00
	17.9.3	**PRE-CAST FLUME HEIGHT 1300MM (Minimum reinforcement 95 kg per Cum)**		
	17.9.3.1	Storm Water Drain (1300x800) MM	RM	12139.00
	17.9.3.2	Storm Water Drain (1200x900) MM	RM	12386.00
	17.9.3.3	Storm Water Drain (1300x1000) MM	RM	12685.00
	17.9.3.4	Storm Water Drain (1300x1100) MM	RM	12932.00
	17.9.3.5	Storm Water Drain (1300x1200) MM	RM	13231.00
	17.9.3.6	Storm Water Drain (1300x1300) MM	RM	13478.00
	17.9.3.7	Storm Water Drain (1300x1400) MM	RM	13835.00
	17.9.3.8	Storm Water Drain (1300x1500) MM	RM	14140.00
	17.9.3.9	Storm Water Drain (1300x1600) MM	RM	14392.00
	17.9.3.10	Storm Water Drain (1300x1700) MM	RM	14696.00
	17.9.3.11	Storm Water Drain (1300x1800) MM	RM	14948.00
	17.9.3.12	Storm Water Drain (1300x1900) MM	RM	15200.00
	17.9.3.13	Storm Water Drain (1300x2000) MM	RM	16941.00
	17.9.3.14	Storm Water Drain (1300x2100) MM	RM	17213.00
	17.9.3.15	Storm Water Drain (1300x2200) MM	RM	17537.00
	17.9.3.16	Storm Water Drain (1300x2300) MM	RM	17809.00
	17.9.3.17	Storm Water Drain (1300x2400) MM	RM	18081.00
	17.9.3.18	Storm Water Drain (1300x2500) MM	RM	18405.00
	17.9.3.19	Storm Water Drain (1300x2600) MM	RM	18761.00
	17.9.4	**PRE-CAST FLUME HEIGHT 1400MM (Minimum reinforcement 95 kg per Cum)**		
	17.9.4.1	Storm Water Drain (1400x800) MM	RM	13091.00
	17.9.4.2	Storm Water Drain (1400x900) MM	RM	13391.00
	17.9.4.3	Storm Water Drain (1400x1000) MM	RM	13638.00
	17.9.4.4	Storm Water Drain (1400x1100) MM	RM	13938.00
	17.9.4.5	Storm Water Drain (1400x1200) MM	RM	14185.00
	17.9.4.6	Storm Water Drain (1400x1300) MM	RM	14484.00
	17.9.4.7	Storm Water Drain (1400x1400) MM	RM	14894.00
	17.9.4.8	Storm Water Drain (1400x1500) MM	RM	15146.00
	17.9.4.9	Storm Water Drain (1400x1600) MM	RM	15451.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	17.9.4.10	Storm Water Drain (1400x1700) MM	RM	15703.00
	17.9.4.11	Storm Water Drain (1400x1800) MM	RM	16008.00
	17.9.4.12	Storm Water Drain (1400x1900) MM	RM	16313.00
	17.9.4.13	Storm Water Drain (1400x2000) MM	RM	18050.00
	17.9.4.14	Storm Water Drain (1400x2100) MM	RM	18375.00
	17.9.4.15	Storm Water Drain (1400x2200) MM	RM	18647.00
	17.9.4.16	Storm Water Drain (1400x2300) MM	RM	18972.00
	17.9.4.17	Storm Water Drain (1400x2400) MM	RM	19297.00
	17.9.4.18	Storm Water Drain (1400x2500) MM	RM	19569.00
	17.9.4.19	Storm Water Drain (1400x2600) MM	RM	19978.00
	17.9.4.20	Storm Water Drain (1400x2700) MM	RM	20250.00
	17.9.4.21	Storm Water Drain (1400x2800) MM	RM	20574.00
	17.9.5	**PRE-CAST FLUME HEIGHT 1500MM (Minimum reinforcement 95 kg per Cum)**		
	17.9.5.1	Storm Water Drain (1500x800) MM	RM	14071.00
	17.9.5.2	Storm Water Drain (1500x900) MM	RM	14238.00
	17.9.5.3	Storm Water Drain (1500x1000) MM	RM	14486.00
	17.9.5.4	Storm Water Drain (1500x1100) MM	RM	14786.00
	17.9.5.5	Storm Water Drain (1500x1200) MM	RM	15086.00
	17.9.5.6	Storm Water Drain (1500x1300) MM	RM	15386.00
	17.9.5.7	Storm Water Drain (1500x1400) MM	RM	15795.00
	17.9.5.8	Storm Water Drain (1500x1500) MM	RM	13014.00
	17.9.5.9	Storm Water Drain (1500x1600) MM	RM	16352.00
	17.9.5.10	Storm Water Drain (1500x1700) MM	RM	16657.00
	17.9.5.11	Storm Water Drain (1500x1800) MM	RM	16963.00
	17.9.5.12	Storm Water Drain (1500x1900) MM	RM	17268.00
	17.9.5.13	Storm Water Drain (1500x2000) MM	RM	19054.00
	17.9.5.14	Storm Water Drain (1500x2100) MM	RM	19380.00
	17.9.5.15	Storm Water Drain (1500x2200) MM	RM	19705.00
	17.9.5.16	Storm Water Drain (1500x2300) MM	RM	20030.00
	17.9.5.17	Storm Water Drain (1500x2400) MM	RM	20355.00
	17.9.5.18	Storm Water Drain (1500x2500) MM	RM	20627.00
	17.9.5.19	Storm Water Drain (1500x2600) MM	RM	21036.00
	17.9.5.20	Storm Water Drain (1500x2700) MM	RM	21361.00
	17.9.5.21	Storm Water Drain (1500x2800) MM	RM	21686.00
	17.9.5.22	Storm Water Drain (1500x2900) MM	RM	22011.00
	17.9.5.23	Storm Water Drain (1500x3000) MM	RM	22283.00
	17.9.6	**PRE-CAST FLUME HEIGHT 1600MM (Minimum reinforcement 95 kg per Cum)**		
	17.9.6.1	Storm Water Drain (1600x800) MM	RM	14659.00
	17.9.6.2	Storm Water Drain (1600x900) MM	RM	14959.00
	17.9.6.3	Storm Water Drain (1600x1000) MM	RM	15206.00
	17.9.6.4	Storm Water Drain (1600x1100) MM	RM	15506.00
	17.9.6.5	Storm Water Drain (1600x1200) MM	RM	15806.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	17.9.6.6	Storm Water Drain (1600x1300) MM	RM	16106.00
	17.9.6.7	Storm Water Drain (1600x1400) MM	RM	16514.00
	17.9.6.8	Storm Water Drain (1600x1500) MM	RM	16766.00
	17.9.6.9	Storm Water Drain (1600x1600) MM	RM	17072.00
	17.9.6.10	Storm Water Drain (1600x1700) MM	RM	17377.00
	17.9.6.11	Storm Water Drain (1600x1800) MM	RM	17682.00
	17.9.6.12	Storm Water Drain (1600x1900) MM	RM	17987.00
	17.9.6.13	Storm Water Drain (1600x2000) MM	RM	19819.00
	17.9.6.14	Storm Water Drain (1600x2100) MM	RM	20144.00
	17.9.6.15	Storm Water Drain (1600x2200) MM	RM	20469.00
	17.9.6.16	Storm Water Drain (1600x2300) MM	RM	20794.00
	17.9.6.17	Storm Water Drain (1600x2400) MM	RM	21119.00
	17.9.6.18	Storm Water Drain (1600x2500) MM	RM	21391.00
	17.9.6.19	Storm Water Drain (1600x2600) MM	RM	21800.00
	17.9.6.20	Storm Water Drain (1600x2700) MM	RM	22125.00
	17.9.6.21	Storm Water Drain (1600x2800) MM	RM	22450.00
	17.9.6.22	Storm Water Drain (1600x2900) MM	RM	22775.00
	17.9.6.23	Storm Water Drain (1600x3000) MM	RM	23048.00
17.10		**Pre-Cast Box Culvert**Providing and placing in position precast cement concrete Box-Culvert as per design and shape, using coarse aggregate and fine aggregate derived from natural sources, ordinary Portland/ admixtures as per design mix IS: 456-2000 and standard like Indian standard international standard viz. Japanese industrial standard (JIS) /US standard/ EU standard having of strength not less than M-50, using Thermo-Mechanically Treated bars, (TMT/TMX) FE 500D or more conforming to IS 1786 reinforcement bar (Minimum reinforcement 95 kg per Cum) and capable of carrying a wheel load of 32.5 Tones with earth cushion 0.20 m to 0.00 m for heavy vehicle movement. Rate includes all cost of material, labour charges at the plant, cost of reinforcement, formwork and lifting accessories, and transportation up to work at the site. Making necessary holes of required sizes for carrying through service lines etc. providing steel hooks for lifting etc. the work to be executed as per the direction of Engineer in- Charge.		
	17.10.1	Box Culvert Size 500x500 mm Th 120mm	RM	13512.00
	17.10.2	Box Culvert Size 600x600 mm Th 120mm	RM	15110.00
	17.10.3	Box Culvert Size 800x800 mm Th 120 mm	RM	18435.00
	17.10.4	Box Culvert Size 600x1000 mm Th 130 mm	RM	21216.00
	17.10.5	Box Culvert Size 900x1000 mm Th 130 mm	RM	24170.00
	17.10.6	Box Culvert Size 1000x1000 mm Th 130 mm	RM	25243.00
	17.10.7	Box Culvert Size 1200x1000 mm Th 130 mm	RM	27256.00
	17.10.8	Box Culvert Size 800x1400 mm Th 130 mm	RM	23910.00
	17.10.9	Box Culvert Size 900x1400 mm Th 130 mm	RM	24708.00
	17.10.10	Box Culvert Size 1000x1400 mm Th 130 mm	RM	25677.00
	17.10.11	Box Culvert Size 1100x1400 mm Th 130 mm	RM	26605.00

Item No.	Sub Item No.	Description	Unit	Rate (In Rs.)
	17.10.12	Box Culvert Size 1200x1400 mm Th 130 mm	RM	27402.00
	17.10.13	Box Culvert Size 1300x1400 mm Th 150 mm	RM	29333.00
	17.10.14	Box Culvert Size 1400x1400 mm Th 150 mm	RM	30262.00
	17.10.15	Box Culvert Size 1500x1400 mm Th 150 mm	RM	31191.00
	17.10.16	Box Culvert Size 2000x1200 mm Th 180 mm	RM	50709.00
	17.10.17	Box Culvert Size 2000x1500 mm Th 180 mm	RM	53560.00
	17.10.18	Box Culvert Size 2000x1800 mm Th 180 mm	RM	56300.00
	17.10.19	Box Culvert Size 2000x2000 mm Th 180 mm	RM	58266.00
	17.10.20	Box Culvert Size 2500x1500 mm Th 220 mm	RM	65236.00
	17.10.21	Box Culvert Size 2500x1800 mm Th 220 mm	RM	68359.00
	17.10.22	Box Culvert Size 2500x2000 mm Th 220 mm	RM	70463.00
	17.10.23	Box Culvert Size 2500x2500 mm Th 220 mm	RM	75622.00
17.11		Construction of RCC drain 1.0m x 1.0m inside dimension lined with 150 mm thick RCC, M-20 side walls, 150 mm thick RCC M-20 bottom slab, over 100 mm thick (Av.) levelling course in PCC M-15 including excavation, dressing of sides and bottom, provision of HYSD reinforcement consisting of 8 mm dia horizontal bars @ 200 mm c/c and U-shaped 10 mm dia vertical bars @ 120 mm c/c including cutting. bending and binding wire, placing in position, with shuttering, Weep holes at drainage layer level and concreting by using concrete mixer, compaction by vibration etc complete as per direction of the Engineer-in-Charge.	RM	4011.00
17.12		Construction of RCC drain 0.75 m x 0.75 m inside dimension lined with 135 mm thick RCC, M-20 side walls, 135 mm thick RCC M-20 bottom slab, over 100 mm thick (Av.) levelling course in PCC M-15 including excavation, dressing of sides and bottom, provision of HYSD reinforcement consisting of 8 mm dia horizontal bars @ 200 mm c/c and U-shaped 10 mm dia vertical bars @ 150 mm c/c including cutting. bending and binding wire, placing in position, with shuttering. Weep holes at drainage layer level and concreting by using concrete mixer, compaction by vibration etc complete as per direction of the Engineer-in-Charge.	RM	2773.00
17.13		Construction of RCC drain 0.60 m x 0.60 m inside dimension lined with 120 mm thick RCC, M-20 side walls, 120 mm thick RCC M-20 bottom slab, over 100 mm thick (Av.) levelling course in PCC M-15 including excavation, dressing of sides and bottom, provision of HYSD reinforcement consisting of 8 mm dia horizontal bars @ 200 mm c/c and U-shaped 8 mm dia vertical bars @ 150 mm c/c including cutting. bending and binding wire, placing in position, with shuttering, Weep holes at drainage layer level and concreting by using concrete mixer, compaction by vibration etc complete as per direction of the Engineer-in-Charge.	RM	2132.00

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