Ministry of Road Transport & Highways,
(Govt. of India)

SCHEDULES

For

Four lanning of Mungiakami - Champaknagar section (NH-08) starting at km 421+850 (design chainage) and ending at km 447+300 (design chainage) (Length-25.450 km) in the State of Tripura on Engineering, procurement & construction (EPC) mode)"

JAN, 2025

National Highways & Infrastructure Development Corporation Ltd
1st and 2nd Floor, Tower A, World Trade Center, Nauroji Nagar.

New Delhi – 110029

Schedule-A

Schedule- A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

(i) Site of the Four-Lane Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this **Schedule-A**

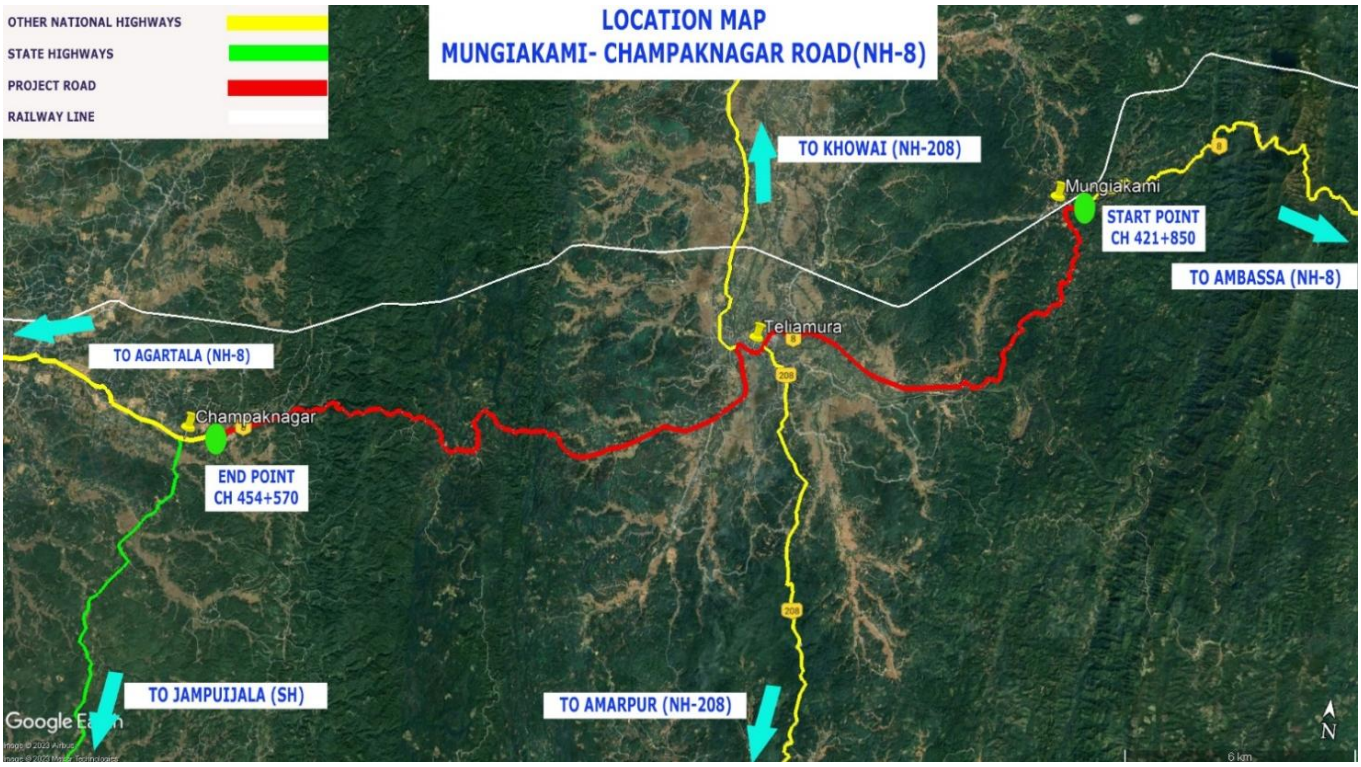
(ii) The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.

(iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to Clause 8.2.1 of this Agreement.

(iv) The alignment plans of the Project Highway are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, improve/upgrade the Road Profile as indicated in Annex-III based on site/design requirement.

(v) The status of the environment clearances obtained or awaited is given in Annex IV.

KEY PLAN


LOCATION MAP
MUNGIAKAMI- CHAMPAKNAGAR ROAD(NH-8)
OTHER NATIONAL HIGHWAYS
STATE HIGHWAYS
PROJECT ROAD
RAILWAY LINE
TO KHOWAI (NH-208)
Mungiakami
START POINT
CH 421+850
TO AMBASSA (NH-8)
Teliamura
TO AGARTALA (NH-8)
Champaknagar
END POINT
CH 454+570
TO JAMPUIJALA (SH)
TO AMARPUR (NH-208)
N

Annex-I
(Schedule-A)

Site

1. Site

The Site of the Four-lane Project Highway starts from Km. 421+850 of NH-08 at Mungiakami, Tripura and ends at Km. 454+570 of NH-08 in Champaknagar Town, Tripura on Churaibari-Agartala road in the state of Tripura.

The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project Highway comprises the land described below:

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
421+850	422+100	250	12	
422+100	422+200	100	8	
422+200	422+300	100	8	
422+300	422+400	100	8	
422+400	422+500	100	8	
422+500	422+600	100	8	
422+600	422+700	100	9	
422+700	422+800	100	9	
422+800	422+900	100	8	
422+900	423+000	100	8	
423+000	423+100	100	9	
423+100	423+200	100	8	
423+200	423+300	100	8	
423+300	423+400	100	8	
423+400	423+500	100	8	
423+500	423+600	100	8	
423+600	423+700	100	9	
423+700	423+800	100	8	
423+800	423+900	100	9	
423+900	424+000	100	8	
424+000	424+100	100	8	
424+100	424+200	100	8	
424+200	424+300	100	9	
424+300	424+400	100	9	
424+400	424+500	100	8	
424+500	424+600	100	8	
424+600	424+700	100	8	
424+700	424+800	100	8	
424+800	424+900	100	9	
424+900	425+000	100	9	
425+000	425+100	100	8	
425+100	425+200	100	9	
425+200	425+300	100	9	
425+300	425+400	100	8	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
425+400	425+500	100	8	
425+500	425+600	100	8	
425+600	425+700	100	8	
425+700	425+800	100	8	
425+800	425+900	100	8	
425+900	426+000	100	8	
426+000	426+100	100	8	
426+100	426+200	100	10	
426+200	426+300	100	10	
426+300	426+400	100	8	
426+400	426+500	100	10	
426+500	426+600	100	9	
426+600	426+700	100	9	
426+700	426+800	100	8	
426+800	426+900	100	9	
426+900	427+000	100	11	
427+000	427+100	100	8	
427+100	427+200	100	8	
427+200	427+300	100	8	
427+300	427+400	100	9	
427+400	427+500	100	9	
427+500	427+600	100	11	
427+600	427+700	100	10	
427+700	427+800	100	10	
427+800	427+900	100	8	
427+900	428+000	100	11	
428+000	428+100	100	8	
428+100	428+200	100	9	
428+200	428+300	100	11	
428+300	428+400	100	8	
428+400	428+500	100	9	
428+500	428+600	100	11	
428+600	428+700	100	9	
428+700	428+800	100	10	
428+800	428+900	100	9	
428+900	429+000	100	9	
429+000	429+100	100	9	
429+100	429+200	100	11	
429+200	429+300	100	12	
429+300	429+400	100	11	
429+400	429+500	100	11	
429+500	429+600	100	14	
429+600	429+700	100	14	
429+700	429+800	100	20	
429+800	429+900	100	17	
429+900	430+000	100	15	
430+000	430+100	100	9	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
430+100	430+200	100	11	
430+200	430+300	100	11	
430+300	430+400	100	11	
430+400	430+500	100	12	
430+500	430+600	100	10	
430+600	430+700	100	12	
430+700	430+800	100	11	
430+800	430+900	100	11	
430+900	431+000	100	10	
431+000	431+100	100	13	
431+100	431+200	100	13	
431+200	431+300	100	13	
431+300	431+400	100	10	
431+400	431+500	100	13	
431+500	431+600	100	13	
431+600	431+700	100	12	
431+700	431+800	100	13	
431+800	431+900	100	13	
431+900	432+000	100	13	
432+000	432+100	100	13	
432+100	432+200	100	13	
432+200	432+300	100	10	
432+300	432+400	100	12	
432+400	432+500	100	12	
432+500	432+600	100	13	
432+600	432+700	100	12	
432+700	432+800	100	11	
432+800	432+900	100	13	
432+900	433+000	100	13	
433+000	433+100	100	13	
433+100	433+200	100	14	
433+200	433+300	100	12	
433+300	433+400	100	12	
433+400	433+500	100	14	
433+500	433+600	100	14	
433+600	433+700	100	14	
433+700	433+800	100	11	
433+800	433+900	100	14	
433+900	434+000	100	13	
434+000	434+100	100	11	
434+100	434+200	100	11	
434+200	434+300	100	11	
434+300	434+400	100	11	
434+400	434+500	100	11	
434+500	434+600	100	11	
434+600	434+700	100	11	
434+700	434+800	100	11	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
434+800	434+900	100	11	
434+900	435+000	100	11	
435+000	435+100	100	11	
435+100	435+200	100	11	
435+200	435+300	100	11	
435+300	436+350	1050	45.72	
436+350	436+400	50	11	
436+400	436+500	100	11	
436+500	436+600	100	11	
436+600	436+700	100	11	
436+700	436+800	100	11	
436+800	436+900	100	11	
436+900	437+000	100	11	
437+000	437+100	100	11	
437+100	437+200	100	11	
437+200	437+300	100	11	
437+300	437+400	100	11	
437+400	437+500	100	11	
437+500	437+600	100	11	
437+600	437+700	100	11	
437+700	437+800	100	11	
437+800	437+900	100	11	
437+900	438+000	100	11	
438+000	438+100	100	11	
438+100	438+200	100	11	
438+200	438+300	100	11	
438+300	438+400	100	11	
438+400	438+500	100	11	
438+500	438+600	100	11	
438+600	438+700	100	11	
438+700	438+800	100	11	
438+800	438+900	100	11	
438+900	439+000	100	13	
439+000	439+100	100	14	
439+100	439+200	100	8	
439+200	439+300	100	7	
439+300	439+400	100	8	
439+400	439+500	100	9	
439+500	439+600	100	9	
439+600	439+700	100	9	
439+700	439+800	100	8	
439+800	439+900	100	10	
439+900	440+000	100	10	
440+000	440+100	100	10	
440+100	440+200	100	10	
440+200	440+300	100	10	
440+300	440+400	100	10	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
440+400	440+500	100	7	
440+500	440+600	100	12	
440+600	440+700	100	12	
440+700	440+800	100	12	
440+800	440+900	100	13	
440+900	441+000	100	13	
441+000	441+100	100	14	
441+100	441+200	100	13	
441+200	441+300	100	11	
441+300	441+400	100	13	
441+400	441+500	100	13	
441+500	441+600	100	9	
441+600	441+700	100	10	
441+700	441+800	100	11	
441+800	441+900	100	15	
441+900	442+000	100	10	
442+000	442+100	100	15	
442+100	442+200	100	12	
442+200	442+300	100	13	
442+300	442+400	100	13	
442+400	442+500	100	15	
442+500	442+600	100	12	
442+600	442+700	100	12	
442+700	442+800	100	12	
442+800	442+900	100	12	
442+900	443+000	100	14	
443+000	443+100	100	11	
443+100	443+200	100	9	
443+200	443+300	100	7	
443+300	443+400	100	10	
443+400	443+500	100	7	
443+500	443+600	100	11	
443+600	443+700	100	8	
443+700	443+800	100	9	
443+800	443+900	100	8	
443+900	444+000	100	8	
444+000	444+100	100	9	
444+100	444+200	100	9	
444+200	444+300	100	8	
444+300	444+400	100	7	
444+400	444+500	100	10	
444+500	444+600	100	14	
444+600	444+700	100	10	
444+700	444+800	100	8	
444+800	444+900	100	11	
444+900	445+000	100	9	
445+000	445+100	100	11	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
445+100	445+200	100	10	
445+200	445+300	100	10	
445+300	445+400	100	9	
445+400	445+500	100	11	
445+500	445+600	100	9	
445+600	445+700	100	9	
445+700	445+800	100	11	
445+800	445+900	100	10	
445+900	446+000	100	12	
446+000	446+100	100	10	
446+100	446+200	100	9	
446+200	446+300	100	9	
446+300	446+400	100	8	
446+400	446+500	100	8	
446+500	446+600	100	8	
446+600	446+700	100	10	
446+700	446+800	100	8	
446+800	446+900	100	10	
446+900	447+000	100	10	
447+000	447+100	100	9	
447+100	447+200	100	8	
447+200	447+300	100	7	
447+300	447+400	100	8	
447+400	447+500	100	11	
447+500	447+600	100	9	
447+600	447+700	100	8	
447+700	447+800	100	10	
447+800	447+900	100	9	
447+900	448+000	100	9	
448+000	448+100	100	9	
448+100	448+200	100	9	
448+200	448+300	100	10	
448+300	448+400	100	8	
448+400	448+500	100	10	
448+500	448+600	100	10	
448+600	448+700	100	8	
448+700	448+800	100	10	
448+800	448+900	100	7	
448+900	449+000	100	8	
449+000	449+100	100	9	
449+100	449+200	100	10	
449+200	449+300	100	10	
449+300	449+400	100	9	
449+400	449+500	100	11	
449+500	449+600	100	9	
449+600	449+700	100	8	
449+700	449+800	100	9	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
449+800	449+900	100	9	
449+900	450+000	100	11	
450+000	450+100	100	9	
450+100	450+200	100	7	
450+200	450+300	100	9	
450+300	450+400	100	9	
450+400	450+500	100	10	
450+500	450+600	100	10	
450+600	450+700	100	6	
450+700	450+800	100	7	
450+800	450+900	100	10	
450+900	451+000	100	8	
451+000	451+100	100	10	
451+100	451+200	100	9	
451+200	451+300	100	12	
451+300	451+400	100	11	
451+400	451+500	100	9	
451+500	451+600	100	7	
451+600	451+700	100	8	
451+700	451+800	100	10	
451+800	451+900	100	9	
451+900	452+000	100	7	
452+000	452+100	100	10	
452+100	452+200	100	11	
452+200	452+300	100	9	
452+300	452+400	100	12	
452+400	452+500	100	8	
452+500	452+600	100	8	
452+600	452+700	100	9	
452+700	452+800	100	9	
452+800	452+900	100	10	
452+900	453+000	100	11	
453+000	453+100	100	8	
453+100	453+200	100	9	
453+200	453+300	100	8	
453+300	453+400	100	7	
453+400	453+500	100	9	
453+500	453+600	100	12	
453+600	453+700	100	10	
453+700	453+800	100	11	
453+800	453+900	100	9	
453+900	454+000	100	9	
454+000	454+100	100	11	
454+100	454+200	100	12	
454+200	453+400	-800	7	
453+400	453+500	100	9	
453+500	453+600	100	12	

Existing Chainage (km)		Length (m)	Right of Way ROW (m)	Remarks
From	To			
453+600	453+700	100	10	
453+700	453+800	100	11	
453+800	453+900	100	9	
453+900	454+000	100	9	
454+000	454+100	100	11	
454+100	454+570	470	12	

3. Carriageway

The present carriageway of the Project Highway is 7.0 m wide & some four lane Stretch in Teliamura Town. The type of the existing pavement is flexible. The detail is given below.

S. N.	Existing Chainage (km)		Length (m)	Carriageway Width (m)	Remarks
	From	To			
1	421+850	435+290	13440	7.0	
2	435+290	436+300	1010	2x7.5	Teliamura Town
3	436+300	454+570	18270	7.0	
Total			32720		

4. Major Bridges

The Site includes the following Major Bridges:

S. N.	Chainage (km)	Type of super structures			No. of Spans with span length (m)	Width (m)
		Foundation	Substructure	Superstructure		
1	435+150	Pile foundation	RCC Pier	PSC Girder	3x30	10

5. Road over-bridges (ROB)/ Road under-bridges (RUB)

The Site includes the following ROB (road over railway line)/RUB (road under railway line):

S. N.	Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)	ROB/RUB
		Foundation	Superstructure			
NIL						

6. Grade separators

The Site includes the following grade separators:

S. No.	Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)
		Foundation	Superstructure		
NIL					

7. Minor bridges

The Site includes the following minor bridges:

S. N.	Chainage (km)	Type of super structures			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Superstructure		
1	436+670	Pile foundation	RCC Abutment	T Beam Girder	1 X 12	7
2	436+950	Open Foundation	RCC Abutment	RCC Solid Slab	3 X 5	11

3	438+250	Pile foundation	RCC Abutment	PSC Girder	1 X 32	7
4	438+870	Pile foundation	RCC Abutment	T Beam Girder	1 X 21	7
5	440+500	Pile foundation	RCC Abutment	T Beam Girder	1 X 21	7
6	441+350	Pile foundation	RCC Abutment	T Beam Girder	1 X 16	7
7	443+020	Pile foundation	RCC Abutment	T Beam Girder	1 X 12	7
8	453+720	Pile foundation	RCC Abutment	PSC Girder	1 X 28	7

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
NIL		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

S. N.	Chainage (km)	Type of Structure	No. of Spans with span length (m)	Width(m)
NIL				

10. Culverts

The Site has the following culverts:

S. N.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Remarks
1	423+980	Slab	1x1.5	
2	424+370	Pipe	2x0.9	
3	424+700	Pipe	1x0.9	
4	424+900	Pipe	1x0.9	
5	425+050	Pipe	1x0.9	
6	425+420	Pipe	1x0.9	
7	429+000	Pipe	1x0.9	
8	429+280	Pipe	1x0.9	
9	429+410	Slab	1x1.5	
10	429+485	Pipe	1x0.9	
11	429+530	Pipe	1x0.9	
12	429+630	Pipe	1x0.9	
13	429+990	Slab	1x1	
14	430+250	Pipe	1x0.9	
15	430+890	Slab	1x1	
16	431+335	Pipe	1x0.9	
17	431+935	Pipe	1x0.9	
18	434+125	Pipe	1x0.9	
19	436+490	Pipe	1x0.6	
20	438+580	Slab	1x1.5	
21	439+835	Blocked	-	
22	440+595	Blocked	-	

S. N.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Remarks
23	441+140	Pipe	1x0.9	
24	441+600	Pipe	2x0.9	
25	442+000	Slab	1x3	
26	442+060	Slab	1x4	
27	442+565	Slab	1x3	
28	445+800	Slab	1x1.5	
29	446+000	Slab	1x1	
30	453+285	Pipe	1x0.9	

11. Bus bays

The details of bus bays on the Site are as follows:

S. N.	Chainage(km)	Length (m)	Left Hand Side	Right Hand side
NIL				

12. Truck Lay byes

The details of truck lay byes are as follows:

S. N.	Chainage (km)	Length (m)	Left Hand Side	Right Hand side
NIL				

13. Roadside drains

The details of the roadside drains are as follows:

S. N.	Location		Type	
	From km	to km	Masonry/CC (Pucca)	Earthen (Kutcha)
NIL				

14. Major Junctions

The details of major junctions are as follow.

S.N.	Ex. Chainage	Type of Junction	Side	Leading To	Type of pavement	Remarks
1	435+885	T	LEFT	AMARPUR	BT	
2	436+800	Y	RIGHT	KHOWAI	BT	

(NH: National Highway, SH: State Highway, MDR: Major District Road)

15. Minor Junctions

The details of the minor junctions are as follows:

S. N.	Ex. Chainage	Type of Junction	Side	Leading To	Type of pavement	Remarks
1	422+100	T	Left	Mungiakami	CC	
2	422+200	T	Right	Budhraipara	BT	
3	422+460	Y	Right	To Village	BT	
4	423+210	T	Right	Mungiakami Elephant Camp	BT	
5	423+280	T	Left	To Village	Earthen	
6	423+380	Y	Left	To Village	Earthen	
7	424+650	T	Left	Pashkar Sarak	Earthen	
8	425+300	T	Left	Baskarchara	Earthen	
9	425+550	T	Left	Dampay	Earthen	

S. N.	Ex. Chainage	Type of Junction	Side	Leading To	Type of pavement	Remarks
10	426+900	T	Right	Chamlay	Earthen	
11	428+250	T	Right	Chaplay	Earthen	
12	429+850	T	Right	Shaplay	Earthen	
13	430+080	T	Right	To Chakmaghat Colony	BT	
14	430+200	T	Right	To Chakmaghat Colony	Earthen	
15	430+330	T	Right	To Chakmaghat Colony	Earthen	
16	430+410	T	Right	To Chakmaghat Colony	Earthen	
17	430+510	T	Left	To Chakmaghat Dam	BT	
18	430+550	T	Right	To Chakmaghat Colony	Earthen	
19	430+900	Y	Right	To Chakmaghat Colony	Earthen	
20	431+260	T	Right	To Chakmaghat Colony	Earthen	
21	431+400	T	Right	Tsr Camp	BT	
22	431+570	T	Right	Sdm Ofc	BT	
23	432+330	T	Right	Jaraillongbari	Earthen	
24	432+420	T	Right	Jaraillongbari	Bt	
25	432+940	Y	Right	Maharanipur	Earthen	
26	433+140	T	Left	Maharanipur	BT	
27	433+260	T	Right	Maharanipur School	BT	
28	43+370	T	Right	Maharanipur	BT	
29	433+850	T	Right	Maharanipur	BT	
30	434+100	T	Right	Krishna Mission School	BT	
31	434+360	T	Left	Netaji Nagar High School	BT	
32	434+650	Y	Right	Krishnapur	BT	
33	434+870	Y	Left	Netaji Nagar	BT	
34	435+050	Y	Right	Krishnapur	BT	
35	441+800	T	Right	Kukibasti	BT	
36	441+950	T	Left	Charanmoni	BT	
37	443+540	Y	Right	South Hadrai Adc	BT	
38	444+260	T	Right	Hathaikotar Ecopark	BT	
39	446+050	T	Right	Salka	BT	
40	446+500	Y	Right	Khamtingbari	BT	
41	446+870	T	Right	Khamtingbari	Earthen	
42	446+970	T	Left	Chindoypara	Earthen	
43	447+250	Y	Left	Chinraibari	Earthen	
44	447+390	Y	Left	Ongc	BT	
45	447+630	Y	Right	Khamtingbari	Earthen	
46	447+790	Y	Left	Toyad	BT	
47	448+000	T	Left	Champabari	Earthen	
48	448+760	T	Right	Village	Earthen	
49	449+180	T	Left	Bardowar School	Earthen	
50	449+430	T	Right	The New Khamtingkami	Earthen	
51	449+550	T	Left	Village	Earthen	
52	450+430	T	Left	Village	Earthen	
53	451+500	T	Left	Village	Earthen	
54	453+650	T	Left	Village	BT	
55	453+750	T	Right	Hathaikotar	BT	

16. Bypasses

The details of the bypasses are as follows:

S. N.	Name of bypass (town)	Chainage (km) From km to km	Length
NIL			

17. Road Length passing through Forest Area

Following stretches of project road are passing through Forest Area

Ex. Chainage		Length (in km)	Land Use as per Cadastal Maps	Remark
From (Km)	To (Km)			
421+850	428+100	6.350	Forest	Khowai District
439+400	441+565	2.165	Forest	Khowai District
441+565	454+570	5.735	Forest	West Tripura District

18. Details of Existing Utilities Schedule

The existing utilities schedules as below,

17.1 Electrical Utilities

The Site includes the following Electrical Utilities: -

(a) Extra High-Tension Lines (EHT Lines)

S. N.	Chainage		Length of line(km)		Nos. of Crossings		Remarks
			Maintained by TPTL Department		Maintained by TPTL Department		
	From	To	400KV	132KV	400KV	132KV	
1	421+850	447+300	-	1.830	-	-	04 nos. of 132 KV HT Tower

b) High Tension/Low Tension Lines (HT/LT Lines)

S.No	Chainage		No of Poles			Nos. of Crossings			Transformer	
	From	To	HT 33KV	HT 11KV	LT 230V / LT 440V	HT 33KV	HT 11KV	LT 230V / LT 440V	No	Capacity
1	421+850	447+300	-	166	703	-	-	-	1 9 8 7 1	500 100 63 25 16

__ nos. of Distribution Transformer

c) Public Health Utilities (Water/Sewage Pipelines)

(a) The Site includes the following Public Health Utilities: -

S.No	Chainage		Length (in m)				Crossings (in m)				Remarks
	From	To	Water Supply Line		Sewage Line		Water Supply Line		Sewage Line		
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	
1	421+850	447+300	1200	-	-	-	601.25	-	-	-	-

(b) Bore well/Hand Pump within RoW

Sl. No.	Bore Well**		Hand Pump	
	Chainage	Nos	Chainage	Nos
NIL				

(c) Water Tank within RoW

Sl. No.	Water Tank		
	Chainage	Nos	Capacity
NIL			

d) **Any Other Items: 2no.**

Sl. No.	Other Items	
	Items	Nos

19. Other Structures: NIL

Annex–II
(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

The dates on which the Authority shall provide Right of Way of Construction Zone to the Contractor on different stretches of the Site are stated below:

(i) Full Right of Way (full width)

Description	Design Chainage (km)		Length (km)	Width (m)	Date of Providing ROW*
	From	To			
Full Right of Way (full width)	421+850	422+200	350	60	On appointed date Within150 days after Appointed Date
	422+200	422+600	400	45	
	422+600	423+100	500	60	
	423+100	424+100	1000	80	
	424+100	426+700	2600	60	
	426+700	426+900	200	45	
	426+900	432+400	5500	60	
	432+400	433+800	1400	80	
	433+800	434+700	900	60	
	434+700	435+800	1100	80	
	435+800	436+400	600	60	
	436+400	439+900	3500	80	
	439+900	440+200	300	60	
	440+200	440+700	500	80	
	440+700	441+400	700	60	
	441+400	442+300	900	80	
	442+300	442+500	200	45	
	442+500	444+300	1800	80	
	444+300	445+300	1000	60	
	445+300	445+500	200	45	
	445+500	446+700	1200	60	
	446+700	447+100	400	80	
	447+100	447+300	200	60	

The dates specified herein shall in no case be beyond 150 (One Hundred & fifty) days after Appointed date.

Annex - III

(Schedule-A)

Alignment Plans

The alignment plan of the Project Highway is available on E - Tendering portal of NHIDCL

The existing alignment of the Project Highway shall be modified in the following sections as per the alignment plan indicated below:

i. The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.

ii. Traffic Signages of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex - IV

(Schedule-A)

Environment Clearances

As per MOEF notification F. No. 21-270/2008-1A.III (dated 22 August 2013), Environmental Clearance is not required for Tripura state.

Annexure -V

(Schedule -A)

Centre Line Coordinates of the Project Road

S.N.	Chainage	Centre line	
		Easting	Northing
1	421850	368788.209	2641630.259
2	421860	368779.625	2641625.130
3	421880	368762.456	2641614.872
4	421900	368745.288	2641604.613
5	421920	368728.119	2641594.354
6	421940	368710.951	2641584.096
7	421960	368693.782	2641573.837
8	421980	368676.613	2641563.579
9	422000	368659.445	2641553.320
10	422020	368642.276	2641543.062
11	422040	368625.118	2641532.786
12	422060	368608.403	2641521.809
13	422080	368592.406	2641509.810
14	422100	368577.190	2641496.835
15	422120	368562.815	2641482.935
16	422140	368549.335	2641468.165
17	422160	368536.804	2641452.581
18	422180	368525.272	2641436.245
19	422200	368514.782	2641419.221
20	422220	368505.375	2641401.574
21	422240	368497.090	2641383.375
22	422260	368489.957	2641364.694
23	422280	368484.005	2641345.603
24	422300	368479.257	2641326.178
25	422320	368475.732	2641306.495
26	422340	368473.442	2641286.630
27	422360	368472.398	2641266.660
28	422380	368472.604	2641246.664
29	422400	368474.058	2641226.721
30	422420	368476.755	2641206.906
31	422440	368480.684	2641187.300
32	422460	368485.830	2641167.976
33	422480	368492.173	2641149.012
34	422500	368499.688	2641130.481
35	422520	368508.345	2641112.456
36	422540	368518.112	2641095.007
37	422560	368528.950	2641078.201
38	422580	368540.816	2641062.106
39	422600	368553.625	2641046.749
40	422620	368566.676	2641031.594
41	422640	368579.663	2641016.384

S.N.	Chainage	Centre line	
		Easting	Northing
42	422660	368592.457	2641001.012
43	422680	368604.919	2640985.370
44	422700	368616.906	2640969.361
45	422720	368628.264	2640952.901
46	422740	368638.836	2640935.927
47	422760	368648.548	2640918.445
48	422780	368657.374	2640900.500
49	422800	368665.292	2640882.137
50	422820	368672.283	2640863.400
51	422840	368678.328	2640844.338
52	422860	368683.413	2640824.998
53	422880	368687.525	2640805.427
54	422900	368690.654	2640785.675
55	422920	368692.791	2640765.792
56	422940	368693.933	2640745.827
57	422960	368694.113	2640725.829
58	422980	368693.486	2640705.840
59	423000	368692.225	2640685.880
60	423020	368690.504	2640665.955
61	423040	368688.498	2640646.056
62	423060	368686.379	2640626.168
63	423080	368684.252	2640606.282
64	423100	368682.124	2640586.395
65	423120	368679.997	2640566.509
66	423140	368677.870	2640546.622
67	423160	368675.743	2640526.736
68	423180	368673.616	2640506.849
69	423200	368671.489	2640486.963
70	423220	368669.362	2640467.076
71	423240	368667.234	2640447.189
72	423260	368665.107	2640427.303
73	423280	368662.980	2640407.416
74	423300	368660.853	2640387.530
75	423320	368658.726	2640367.643
76	423340	368656.599	2640347.757
77	423360	368654.471	2640327.870
78	423380	368652.344	2640307.984
79	423400	368650.217	2640288.097
80	423420	368648.090	2640268.210
81	423440	368645.963	2640248.324
82	423460	368643.836	2640228.437

S.N.	Chainage	Centre line	
		Easting	Northing
83	423480	368641.708	2640208.551
84	423500	368639.581	2640188.664
85	423520	368637.454	2640168.778
86	423540	368635.327	2640148.891
87	423560	368633.200	2640129.005
88	423580	368631.073	2640109.118
89	423600	368628.945	2640089.231
90	423620	368626.818	2640069.345
91	423640	368624.691	2640049.458
92	423660	368622.564	2640029.572
93	423680	368620.437	2640009.685
94	423700	368618.310	2639989.799
95	423720	368616.183	2639969.912
96	423740	368614.055	2639950.025
97	423760	368611.928	2639930.139
98	423780	368609.801	2639910.252
99	423800	368607.674	2639890.366
100	423820	368605.547	2639870.479
101	423840	368603.420	2639850.593
102	423860	368601.292	2639830.706
103	423880	368599.165	2639810.820
104	423900	368597.038	2639790.933
105	423920	368594.911	2639771.046
106	423940	368592.784	2639751.160
107	423960	368590.657	2639731.273
108	423980	368588.529	2639711.387
109	424000	368586.402	2639691.500
110	424020	368584.275	2639671.614
111	424040	368582.148	2639651.727
112	424060	368580.021	2639631.841
113	424080	368577.894	2639611.954
114	424100	368575.767	2639592.067
115	424120	368573.639	2639572.181
116	424140	368571.512	2639552.294
117	424160	368569.385	2639532.408
118	424180	368567.258	2639512.521
119	424200	368565.126	2639492.635
120	424220	368562.901	2639472.759
121	424240	368560.420	2639452.914
122	424260	368557.518	2639433.126
123	424280	368554.037	2639413.433
124	424300	368549.904	2639393.865
125	424320	368545.121	2639374.446
126	424340	368539.694	2639355.198
127	424360	368533.628	2639336.141
128	424380	368526.930	2639317.297
129	424400	368519.609	2639298.686
130	424420	368511.670	2639280.330

S.N.	Chainage	Centre line	
		Easting	Northing
131	424440	368503.125	2639262.248
132	424460	368493.982	2639244.462
133	424480	368484.251	2639226.990
134	424500	368473.943	2639209.852
135	424520	368463.070	2639193.067
136	424540	368451.643	2639176.653
137	424560	368439.676	2639160.630
138	424580	368427.181	2639145.015
139	424600	368414.173	2639129.824
140	424620	368400.666	2639115.075
141	424640	368386.675	2639100.785
142	424660	368372.215	2639086.969
143	424680	368357.303	2639073.643
144	424700	368341.955	2639060.821
145	424720	368326.188	2639048.517
146	424740	368310.020	2639036.746
147	424760	368293.469	2639025.521
148	424780	368276.553	2639014.853
149	424800	368259.297	2639004.744
150	424820	368241.774	2638995.104
151	424840	368224.074	2638985.792
152	424860	368206.279	2638976.663
153	424880	368188.461	2638967.580
154	424900	368170.642	2638958.497
155	424920	368152.823	2638949.414
156	424940	368135.005	2638940.332
157	424960	368117.186	2638931.249
158	424980	368099.367	2638922.167
159	425000	368081.548	2638913.084
160	425020	368063.730	2638904.001
161	425040	368045.911	2638894.919
162	425060	368028.092	2638885.836
163	425080	368010.274	2638876.753
164	425100	367992.455	2638867.671
165	425120	367974.636	2638858.588
166	425140	367956.818	2638849.506
167	425160	367938.999	2638840.423
168	425180	367921.180	2638831.340
169	425200	367903.361	2638822.258
170	425220	367885.543	2638813.175
171	425240	367867.724	2638804.093
172	425260	367849.905	2638795.010
173	425280	367832.087	2638785.927
174	425300	367814.268	2638776.845
175	425320	367796.449	2638767.762
176	425340	367778.631	2638758.680
177	425360	367760.970	2638749.295
178	425380	367743.699	2638739.214

S.N.	Chainage	Centre line	
		Easting	Northing
179	425400	367726.844	2638728.450
180	425420	367710.433	2638717.020
181	425440	367694.489	2638704.948
182	425460	367678.739	2638692.622
183	425480	367662.988	2638680.297
184	425500	367647.237	2638667.971
185	425520	367631.487	2638655.646
186	425540	367615.736	2638643.321
187	425560	367599.985	2638630.995
188	425580	367584.235	2638618.670
189	425600	367568.484	2638606.344
190	425620	367552.733	2638594.019
191	425640	367536.983	2638581.693
192	425660	367521.309	2638569.272
193	425680	367506.481	2638555.858
194	425700	367492.772	2638541.303
195	425720	367480.271	2638525.698
196	425740	367469.056	2638509.145
197	425760	367459.201	2638491.748
198	425780	367450.767	2638473.619
199	425800	367443.809	2638454.874
200	425820	367437.959	2638435.749
201	425840	367432.163	2638416.607
202	425860	367426.368	2638397.465
203	425880	367420.573	2638378.323
204	425900	367414.777	2638359.181
205	425920	367408.982	2638340.039
206	425940	367403.187	2638320.898
207	425960	367397.391	2638301.756
208	425980	367391.596	2638282.614
209	426000	367385.801	2638263.472
210	426020	367380.005	2638244.330
211	426040	367374.210	2638225.188
212	426060	367368.415	2638206.046
213	426080	367362.619	2638186.904
214	426100	367356.824	2638167.762
215	426120	367351.029	2638148.620
216	426140	367345.233	2638129.478
217	426160	367339.438	2638110.336
218	426180	367333.643	2638091.194
219	426200	367327.847	2638072.052
220	426220	367322.052	2638052.910
221	426240	367316.257	2638033.768
222	426260	367310.460	2638014.627
223	426280	367304.549	2637995.520
224	426300	367298.448	2637976.474
225	426320	367292.156	2637957.489
226	426340	367285.688	2637938.564

S.N.	Chainage	Centre line	
		Easting	Northing
227	426360	367279.182	2637919.652
228	426380	367272.676	2637900.739
229	426400	367266.171	2637881.827
230	426420	367259.665	2637862.915
231	426440	367253.159	2637844.003
232	426460	367246.653	2637825.090
233	426480	367240.148	2637806.178
234	426500	367233.642	2637787.266
235	426520	367227.136	2637768.353
236	426540	367220.631	2637749.441
237	426560	367214.125	2637730.529
238	426580	367207.619	2637711.616
239	426600	367201.113	2637692.704
240	426620	367194.608	2637673.792
241	426640	367188.102	2637654.879
242	426660	367181.596	2637635.967
243	426680	367175.090	2637617.055
244	426700	367168.585	2637598.143
245	426720	367162.079	2637579.230
246	426740	367155.573	2637560.318
247	426760	367149.068	2637541.406
248	426780	367142.562	2637522.493
249	426800	367136.056	2637503.581
250	426820	367129.550	2637484.669
251	426840	367123.045	2637465.756
252	426860	367116.539	2637446.844
253	426880	367110.033	2637427.932
254	426900	367103.527	2637409.019
255	426920	367097.022	2637390.107
256	426940	367090.516	2637371.195
257	426960	367084.010	2637352.282
258	426980	367077.505	2637333.370
259	427000	367070.999	2637314.458
260	427020	367064.483	2637295.549
261	427040	367057.851	2637276.681
262	427060	367050.939	2637257.913
263	427080	367043.587	2637239.314
264	427100	367035.640	2637220.962
265	427120	367026.948	2637202.951
266	427140	367017.397	2637185.382
267	427160	367006.979	2637168.312
268	427180	366995.720	2637151.784
269	427200	366983.650	2637135.840
270	427220	366970.798	2637120.519
271	427240	366957.197	2637105.859
272	427260	366942.887	2637091.889
273	427280	366927.982	2637078.555
274	427300	366912.621	2637065.749

S.N.	Chainage	Centre line	
		Easting	Northing
275	427320	366896.929	2637053.350
276	427340	366881.021	2637041.227
277	427360	366865.008	2637029.245
278	427380	366848.976	2637017.288
279	427400	366832.944	2637005.330
280	427420	366816.913	2636993.372
281	427440	366800.881	2636981.415
282	427460	366784.849	2636969.457
283	427480	366768.818	2636957.500
284	427500	366752.786	2636945.542
285	427520	366736.754	2636933.584
286	427540	366720.722	2636921.627
287	427560	366704.691	2636909.669
288	427580	366688.659	2636897.712
289	427600	366672.627	2636885.754
290	427620	366656.596	2636873.797
291	427640	366640.564	2636861.839
292	427660	366624.517	2636849.902
293	427680	366608.370	2636838.100
294	427700	366592.025	2636826.575
295	427720	366575.389	2636815.475
296	427740	366558.381	2636804.954
297	427760	366540.936	2636795.178
298	427780	366523.030	2636786.272
299	427800	366504.702	2636778.273
300	427820	366485.997	2636771.200
301	427840	366466.962	2636765.070
302	427860	366447.651	2636759.870
303	427880	366428.142	2636755.469
304	427900	366408.501	2636751.704
305	427920	366388.775	2636748.407
306	427940	366369.001	2636745.408
307	427960	366349.208	2636742.536
308	427980	366329.414	2636739.676
309	428000	366309.619	2636736.815
310	428020	366289.825	2636733.954
311	428040	366270.031	2636731.094
312	428060	366250.236	2636728.233
313	428080	366230.442	2636725.372
314	428100	366210.648	2636722.512
315	428120	366190.853	2636719.651
316	428140	366171.059	2636716.791
317	428160	366151.265	2636713.930
318	428180	366131.470	2636711.069
319	428200	366111.676	2636708.209
320	428220	366091.881	2636705.348
321	428240	366072.087	2636702.487
322	428260	366052.293	2636699.627

S.N.	Chainage	Centre line	
		Easting	Northing
323	428280	366032.498	2636696.766
324	428300	366012.704	2636693.905
325	428320	365992.910	2636691.045
326	428340	365973.115	2636688.184
327	428360	365953.321	2636685.323
328	428380	365933.527	2636682.463
329	428400	365913.732	2636679.602
330	428420	365893.938	2636676.742
331	428440	365874.144	2636673.881
332	428460	365854.349	2636671.020
333	428480	365834.555	2636668.160
334	428500	365814.760	2636665.299
335	428520	365794.966	2636662.438
336	428540	365775.172	2636659.578
337	428560	365755.377	2636656.717
338	428580	365735.583	2636653.856
339	428600	365715.789	2636650.996
340	428620	365695.994	2636648.135
341	428640	365676.200	2636645.274
342	428660	365656.406	2636642.414
343	428680	365636.611	2636639.553
344	428700	365616.817	2636636.692
345	428720	365597.031	2636633.771
346	428740	365577.275	2636630.657
347	428760	365557.552	2636627.345
348	428780	365537.862	2636623.836
349	428800	365518.208	2636620.133
350	428820	365498.567	2636616.361
351	428840	365478.926	2636612.589
352	428860	365459.285	2636608.817
353	428880	365439.644	2636605.045
354	428900	365420.002	2636601.273
355	428920	365400.361	2636597.501
356	428940	365380.720	2636593.729
357	428960	365361.079	2636589.957
358	428980	365341.438	2636586.184
359	429000	365321.797	2636582.412
360	429020	365302.156	2636578.640
361	429040	365282.515	2636574.870
362	429060	365262.870	2636571.116
363	429080	365243.222	2636567.381
364	429100	365223.570	2636563.666
365	429120	365203.916	2636559.962
366	429140	365184.262	2636556.257
367	429160	365164.608	2636552.553
368	429180	365144.954	2636548.848
369	429200	365125.300	2636545.144
370	429220	365105.646	2636541.439

S.N.	Chainage	Centre line	
		Easting	Northing
371	429240	365085.993	2636537.735
372	429260	365066.339	2636534.030
373	429280	365046.685	2636530.326
374	429300	365027.031	2636526.621
375	429320	365007.377	2636522.917
376	429340	364987.723	2636519.212
377	429360	364968.069	2636515.508
378	429380	364948.415	2636511.803
379	429400	364928.761	2636508.099
380	429420	364909.107	2636504.394
381	429440	364889.453	2636500.690
382	429460	364869.799	2636496.985
383	429480	364850.145	2636493.281
384	429500	364830.492	2636489.576
385	429520	364810.838	2636485.872
386	429540	364791.188	2636482.146
387	429560	364771.571	2636478.251
388	429580	364751.994	2636474.160
389	429600	364732.459	2636469.873
390	429620	364712.967	2636465.391
391	429640	364693.522	2636460.715
392	429660	364674.124	2636455.844
393	429680	364654.776	2636450.780
394	429700	364635.479	2636445.522
395	429720	364616.237	2636440.072
396	429740	364597.049	2636434.430
397	429760	364577.889	2636428.694
398	429780	364558.730	2636422.957
399	429800	364539.570	2636417.221
400	429820	364520.410	2636411.485
401	429840	364501.250	2636405.749
402	429860	364482.091	2636400.013
403	429880	364462.930	2636394.280
404	429900	364443.744	2636388.631
405	429920	364424.489	2636383.224
406	429940	364405.125	2636378.224
407	429960	364385.622	2636373.797
408	429980	364365.968	2636370.100
409	430000	364346.182	2636367.189
410	430020	364326.304	2636364.993
411	430040	364306.372	2636363.352
412	430060	364286.411	2636362.100
413	430080	364266.438	2636361.069
414	430100	364246.461	2636360.100
415	430120	364226.485	2636359.131
416	430140	364206.508	2636358.162
417	430160	364186.532	2636357.194
418	430180	364166.555	2636356.225

S.N.	Chainage	Centre line	
		Easting	Northing
419	430200	364146.579	2636355.256
420	430220	364126.602	2636354.287
421	430240	364106.626	2636353.319
422	430260	364086.649	2636352.350
423	430280	364066.673	2636351.381
424	430300	364046.696	2636350.413
425	430320	364026.720	2636349.444
426	430340	364006.743	2636348.475
427	430360	363986.767	2636347.507
428	430380	363966.790	2636346.538
429	430400	363946.814	2636345.569
430	430420	363926.837	2636344.600
431	430440	363906.860	2636343.632
432	430460	363886.884	2636342.663
433	430480	363866.907	2636341.694
434	430500	363846.931	2636340.726
435	430520	363826.954	2636339.757
436	430540	363806.978	2636338.788
437	430560	363787.001	2636337.820
438	430580	363767.025	2636336.851
439	430600	363747.048	2636335.882
440	430620	363727.072	2636334.913
441	430640	363707.095	2636333.945
442	430660	363687.119	2636332.976
443	430680	363667.142	2636332.007
444	430700	363647.166	2636331.039
445	430720	363627.189	2636330.070
446	430740	363607.213	2636329.101
447	430760	363587.236	2636328.133
448	430780	363567.260	2636327.164
449	430800	363547.283	2636326.195
450	430820	363527.306	2636325.226
451	430840	363507.330	2636324.258
452	430860	363487.353	2636323.289
453	430880	363467.377	2636322.320
454	430900	363447.400	2636321.350
455	430920	363427.428	2636320.306
456	430940	363407.469	2636319.021
457	430960	363387.542	2636317.322
458	430980	363367.674	2636315.037
459	431000	363347.908	2636311.997
460	431020	363328.305	2636308.041
461	431040	363308.924	2636303.113
462	431060	363289.814	2636297.221
463	431080	363271.022	2636290.382
464	431100	363252.595	2636282.612
465	431120	363234.579	2636273.932
466	431140	363216.996	2636264.405

S.N.	Chainage	Centre line	
		Easting	Northing
467	431160	363199.803	2636254.190
468	431180	363182.932	2636243.448
469	431200	363166.304	2636232.336
470	431220	363149.827	2636221.000
471	431240	363133.406	2636209.583
472	431260	363116.987	2636198.163
473	431280	363100.568	2636186.742
474	431300	363084.150	2636175.322
475	431320	363067.731	2636163.901
476	431340	363051.312	2636152.481
477	431360	363034.894	2636141.060
478	431380	363018.475	2636129.640
479	431400	363002.057	2636118.219
480	431420	362985.638	2636106.799
481	431440	362969.219	2636095.378
482	431460	362952.801	2636083.957
483	431480	362936.382	2636072.537
484	431500	362919.963	2636061.116
485	431520	362903.545	2636049.696
486	431540	362887.126	2636038.275
487	431560	362870.708	2636026.855
488	431580	362854.289	2636015.434
489	431600	362837.870	2636004.014
490	431620	362821.452	2635992.593
491	431640	362805.033	2635981.173
492	431660	362788.614	2635969.752
493	431680	362772.196	2635958.332
494	431700	362755.777	2635946.911
495	431720	362739.359	2635935.490
496	431740	362722.940	2635924.070
497	431760	362706.521	2635912.649
498	431780	362690.103	2635901.229
499	431800	362673.684	2635889.808
500	431820	362657.265	2635878.388
501	431840	362640.847	2635866.967
502	431860	362624.428	2635855.547
503	431880	362608.010	2635844.126
504	431900	362591.591	2635832.706
505	431920	362575.172	2635821.285
506	431940	362558.754	2635809.864
507	431960	362542.335	2635798.444
508	431980	362525.916	2635787.023
509	432000	362509.498	2635775.603
510	432020	362493.079	2635764.182
511	432040	362476.661	2635752.762
512	432060	362460.242	2635741.341
513	432080	362443.823	2635729.921
514	432100	362427.405	2635718.500

S.N.	Chainage	Centre line	
		Easting	Northing
515	432120	362410.986	2635707.080
516	432140	362394.567	2635695.659
517	432160	362378.149	2635684.239
518	432180	362361.730	2635672.818
519	432200	362345.312	2635661.397
520	432220	362328.893	2635649.977
521	432240	362312.474	2635638.556
522	432260	362296.056	2635627.136
523	432280	362279.637	2635615.715
524	432300	362263.218	2635604.295
525	432320	362246.800	2635592.874
526	432340	362230.381	2635581.454
527	432360	362213.963	2635570.033
528	432380	362197.544	2635558.613
529	432400	362181.125	2635547.192
530	432420	362164.707	2635535.772
531	432440	362148.288	2635524.351
532	432460	362131.869	2635512.930
533	432480	362115.451	2635501.510
534	432500	362099.032	2635490.089
535	432520	362082.614	2635478.669
536	432540	362066.195	2635467.248
537	432560	362049.776	2635455.828
538	432580	362033.358	2635444.407
539	432600	362016.939	2635432.987
540	432620	362000.520	2635421.566
541	432640	361984.102	2635410.146
542	432660	361967.683	2635398.725
543	432680	361951.264	2635387.305
544	432700	361934.846	2635375.884
545	432720	361918.427	2635364.463
546	432740	361902.009	2635353.043
547	432760	361885.590	2635341.622
548	432780	361869.171	2635330.202
549	432800	361852.752	2635318.782
550	432820	361836.301	2635307.409
551	432840	361819.728	2635296.214
552	432860	361802.943	2635285.339
553	432880	361785.865	2635274.932
554	432900	361768.426	2635265.144
555	432920	361750.610	2635256.058
556	432940	361732.446	2635247.691
557	432960	361713.961	2635240.058
558	432980	361695.186	2635233.170
559	433000	361676.150	2635227.039
560	433020	361656.885	2635221.673
561	433040	361637.434	2635217.022
562	433060	361617.856	2635212.937

S.N.	Chainage	Centre line	
		Easting	Northing
563	433080	361598.198	2635209.257
564	433100	361578.497	2635205.815
565	433120	361558.781	2635202.453
566	433140	361539.066	2635199.092
567	433160	361519.350	2635195.732
568	433180	361499.634	2635192.372
569	433200	361479.918	2635189.012
570	433220	361460.203	2635185.651
571	433240	361440.487	2635182.291
572	433260	361420.771	2635178.931
573	433280	361401.056	2635175.571
574	433300	361381.340	2635172.210
575	433320	361361.624	2635168.850
576	433340	361341.909	2635165.490
577	433360	361322.193	2635162.130
578	433380	361302.477	2635158.769
579	433400	361282.761	2635155.409
580	433420	361263.046	2635152.049
581	433440	361243.330	2635148.689
582	433460	361223.614	2635145.328
583	433480	361203.899	2635141.968
584	433500	361184.183	2635138.608
585	433520	361164.467	2635135.248
586	433540	361144.752	2635131.887
587	433560	361125.036	2635128.527
588	433580	361105.320	2635125.167
589	433600	361085.605	2635121.806
590	433620	361065.889	2635118.446
591	433640	361046.173	2635115.086
592	433660	361026.457	2635111.726
593	433680	361006.742	2635108.365
594	433700	360987.026	2635105.005
595	433720	360967.310	2635101.645
596	433740	360947.595	2635098.285
597	433760	360927.879	2635094.924
598	433780	360908.167	2635091.540
599	433800	360888.484	2635087.994
600	433820	360868.864	2635084.116
601	433840	360849.350	2635079.737
602	433860	360829.999	2635074.691
603	433880	360810.882	2635068.819
604	433900	360792.078	2635062.013
605	433920	360773.638	2635054.276
606	433940	360755.607	2635045.627
607	433960	360738.031	2635036.087
608	433980	360720.954	2635025.681
609	434000	360704.418	2635014.434
610	434020	360688.465	2635002.375

S.N.	Chainage	Centre line	
		Easting	Northing
611	434040	360673.127	2634989.543
612	434060	360658.362	2634976.054
613	434080	360644.077	2634962.057
614	434100	360630.163	2634947.691
615	434120	360616.503	2634933.083
616	434140	360602.972	2634918.355
617	434160	360589.464	2634903.606
618	434180	360575.955	2634888.858
619	434200	360562.447	2634874.109
620	434220	360548.938	2634859.361
621	434240	360535.429	2634844.612
622	434260	360521.921	2634829.864
623	434280	360508.412	2634815.116
624	434300	360494.904	2634800.367
625	434320	360481.395	2634785.619
626	434340	360467.886	2634770.870
627	434360	360454.378	2634756.122
628	434380	360440.869	2634741.373
629	434400	360427.361	2634726.625
630	434420	360413.852	2634711.876
631	434440	360400.343	2634697.128
632	434460	360386.835	2634682.379
633	434480	360373.326	2634667.631
634	434500	360359.806	2634652.893
635	434520	360346.187	2634638.247
636	434540	360332.350	2634623.806
637	434560	360318.184	2634609.689
638	434580	360303.626	2634595.976
639	434600	360288.682	2634582.685
640	434620	360273.365	2634569.826
641	434640	360257.687	2634557.409
642	434660	360241.660	2634545.446
643	434680	360225.298	2634533.945
644	434700	360208.615	2634522.917
645	434720	360191.623	2634512.370
646	434740	360174.336	2634502.312
647	434760	360156.770	2634492.752
648	434780	360138.937	2634483.698
649	434800	360120.853	2634475.158
650	434820	360102.533	2634467.137
651	434840	360083.991	2634459.643
652	434860	360065.242	2634452.681
653	434880	360046.302	2634446.259
654	434900	360027.186	2634440.379
655	434920	360007.911	2634435.049
656	434940	359988.490	2634430.271
657	434960	359968.942	2634426.050
658	434980	359949.280	2634422.389

S.N.	Chainage	Centre line	
		Easting	Northing
659	435000	359929.522	2634419.291
660	435020	359909.684	2634416.759
661	435040	359889.781	2634414.795
662	435060	359869.831	2634413.400
663	435080	359849.848	2634412.575
664	435100	359829.851	2634412.322
665	435120	359809.854	2634412.640
666	435140	359789.874	2634413.529
667	435160	359769.928	2634414.989
668	435180	359750.032	2634417.018
669	435200	359730.202	2634419.614
670	435220	359710.454	2634422.776
671	435240	359690.805	2634426.501
672	435260	359671.270	2634430.786
673	435280	359651.865	2634435.624
674	435300	359632.585	2634440.943
675	435320	359613.398	2634446.587
676	435340	359594.261	2634452.399
677	435360	359575.134	2634458.243
678	435380	359556.007	2634464.086
679	435400	359536.880	2634469.930
680	435420	359517.752	2634475.773
681	435440	359498.625	2634481.617
682	435460	359479.498	2634487.460
683	435480	359460.371	2634493.304
684	435500	359441.243	2634499.148
685	435520	359422.116	2634504.991
686	435540	359402.989	2634510.835
687	435560	359383.855	2634516.657
688	435580	359364.680	2634522.342
689	435600	359345.434	2634527.782
690	435620	359326.118	2634532.966
691	435640	359306.734	2634537.891
692	435660	359287.286	2634542.558
693	435680	359267.778	2634546.965
694	435700	359248.213	2634551.111
695	435720	359228.594	2634554.997
696	435740	359208.925	2634558.620
697	435760	359189.209	2634561.981
698	435780	359169.451	2634565.078
699	435800	359149.653	2634567.912
700	435820	359129.819	2634570.482
701	435840	359109.952	2634572.787
702	435860	359090.057	2634574.826
703	435880	359070.136	2634576.601
704	435900	359050.196	2634578.149
705	435920	359030.249	2634579.605
706	435940	359010.302	2634581.056

S.N.	Chainage	Centre line	
		Easting	Northing
707	435960	358990.354	2634582.507
708	435980	358970.407	2634583.958
709	436000	358950.460	2634585.409
710	436020	358930.512	2634586.860
711	436040	358910.565	2634588.311
712	436060	358890.618	2634589.762
713	436080	358870.670	2634591.213
714	436100	358850.723	2634592.664
715	436120	358830.776	2634594.115
716	436140	358810.829	2634595.566
717	436160	358790.881	2634597.017
718	436180	358770.934	2634598.468
719	436200	358750.987	2634599.919
720	436220	358731.039	2634601.370
721	436240	358711.092	2634602.821
722	436260	358691.145	2634604.272
723	436280	358671.197	2634605.723
724	436300	358651.250	2634607.174
725	436320	358631.303	2634608.625
726	436340	358611.356	2634610.076
727	436360	358591.408	2634611.527
728	436380	358571.461	2634612.978
729	436400	358551.514	2634614.429
730	436420	358531.566	2634615.880
731	436440	358511.619	2634617.331
732	436460	358491.672	2634618.781
733	436480	358471.725	2634620.232
734	436500	358451.777	2634621.683
735	436520	358431.830	2634623.134
736	436540	358411.883	2634624.585
737	436560	358391.935	2634626.036
738	436580	358371.984	2634627.429
739	436600	358352.019	2634628.613
740	436620	358332.036	2634629.423
741	436640	358312.039	2634629.709
742	436660	358292.041	2634629.425
743	436680	358272.060	2634628.569
744	436700	358252.112	2634627.143
745	436720	358232.212	2634625.147
746	436740	358212.378	2634622.584
747	436760	358192.625	2634619.455
748	436780	358172.969	2634615.764
749	436800	358153.427	2634611.512
750	436820	358134.014	2634606.704
751	436840	358114.747	2634601.343
752	436860	358095.641	2634595.434
753	436880	358076.711	2634588.981
754	436900	358057.973	2634581.991

S.N.	Chainage	Centre line	
		Easting	Northing
755	436920	358039.443	2634574.467
756	436940	358021.135	2634566.418
757	436960	358003.064	2634557.849
758	436980	357985.246	2634548.767
759	437000	357967.694	2634539.180
760	437020	357950.422	2634529.099
761	437040	357933.396	2634518.605
762	437060	357916.541	2634507.839
763	437080	357899.771	2634496.941
764	437100	357883.015	2634486.022
765	437120	357866.258	2634475.104
766	437140	357849.502	2634464.185
767	437160	357832.745	2634453.266
768	437180	357815.988	2634442.349
769	437200	357799.193	2634431.488
770	437220	357782.277	2634420.820
771	437240	357765.153	2634410.487
772	437260	357747.748	2634400.637
773	437280	357730.027	2634391.367
774	437300	357712.018	2634382.670
775	437320	357693.793	2634374.433
776	437340	357675.431	2634366.508
777	437360	357657.000	2634358.742
778	437380	357638.557	2634351.005
779	437400	357620.114	2634343.269
780	437420	357601.671	2634335.532
781	437440	357583.228	2634327.796
782	437460	357564.785	2634320.059
783	437480	357546.341	2634312.323
784	437500	357527.898	2634304.586
785	437520	357509.455	2634296.850
786	437540	357491.012	2634289.113
787	437560	357472.569	2634281.377
788	437580	357454.126	2634273.640
789	437600	357435.683	2634265.904
790	437620	357417.240	2634258.167
791	437640	357398.797	2634250.431
792	437660	357380.354	2634242.694
793	437680	357361.911	2634234.958
794	437700	357343.468	2634227.221
795	437720	357325.025	2634219.485
796	437740	357306.582	2634211.748
797	437760	357288.139	2634204.012
798	437780	357269.696	2634196.275
799	437800	357251.253	2634188.539
800	437820	357232.809	2634180.802
801	437840	357214.366	2634173.066
802	437860	357195.923	2634165.329

S.N.	Chainage	Centre line	
		Easting	Northing
803	437880	357177.480	2634157.593
804	437900	357159.037	2634149.856
805	437920	357140.594	2634142.120
806	437940	357122.151	2634134.383
807	437960	357103.708	2634126.647
808	437980	357085.265	2634118.910
809	438000	357066.822	2634111.174
810	438020	357048.379	2634103.437
811	438040	357029.936	2634095.701
812	438060	357011.493	2634087.964
813	438080	356993.050	2634080.228
814	438100	356974.607	2634072.491
815	438120	356956.164	2634064.755
816	438140	356937.721	2634057.018
817	438160	356919.277	2634049.282
818	438180	356900.834	2634041.545
819	438200	356882.391	2634033.808
820	438220	356863.948	2634026.072
821	438240	356845.505	2634018.335
822	438260	356827.062	2634010.599
823	438280	356808.619	2634002.862
824	438300	356790.176	2633995.126
825	438320	356771.733	2633987.389
826	438340	356753.290	2633979.653
827	438360	356734.847	2633971.916
828	438380	356716.404	2633964.180
829	438400	356697.961	2633956.443
830	438420	356679.510	2633948.726
831	438440	356661.001	2633941.148
832	438460	356642.374	2633933.865
833	438480	356623.577	2633927.036
834	438500	356604.575	2633920.802
835	438520	356585.375	2633915.206
836	438540	356565.999	2633910.252
837	438560	356546.469	2633905.947
838	438580	356526.806	2633902.295
839	438600	356507.032	2633899.300
840	438620	356487.170	2633896.966
841	438640	356467.241	2633895.295
842	438660	356447.267	2633894.289
843	438680	356427.271	2633893.950
844	438700	356407.274	2633894.277
845	438720	356387.300	2633895.270
846	438740	356367.370	2633896.929
847	438760	356347.506	2633899.251
848	438780	356327.730	2633902.233
849	438800	356308.065	2633905.873
850	438820	356288.533	2633910.167

S.N.	Chainage	Centre line	
		Easting	Northing
851	438840	356269.154	2633915.108
852	438860	356249.950	2633920.693
853	438880	356230.944	2633926.915
854	438900	356212.155	2633933.767
855	438920	356193.605	2633941.241
856	438940	356175.315	2633949.330
857	438960	356157.304	2633958.023
858	438980	356139.593	2633967.312
859	439000	356122.201	2633977.186
860	439020	356105.148	2633987.634
861	439040	356088.453	2633998.644
862	439060	356072.134	2634010.205
863	439080	356056.209	2634022.303
864	439100	356040.697	2634034.926
865	439120	356025.613	2634048.058
866	439140	356010.976	2634061.686
867	439160	355996.784	2634075.777
868	439180	355982.955	2634090.225
869	439200	355969.375	2634104.907
870	439220	355955.924	2634119.708
871	439240	355942.496	2634134.530
872	439260	355929.069	2634149.353
873	439280	355915.642	2634164.176
874	439300	355902.215	2634178.998
875	439320	355888.787	2634193.821
876	439340	355875.360	2634208.643
877	439360	355861.929	2634223.463
878	439380	355848.430	2634238.220
879	439400	355834.745	2634252.804
880	439420	355820.759	2634267.100
881	439440	355806.386	2634281.006
882	439460	355791.622	2634294.497
883	439480	355776.478	2634307.560
884	439500	355760.967	2634320.185
885	439520	355745.102	2634332.362
886	439540	355728.896	2634344.081
887	439560	355712.362	2634355.332
888	439580	355695.513	2634366.106
889	439600	355678.363	2634376.394
890	439620	355660.926	2634386.188
891	439640	355643.216	2634395.480
892	439660	355625.248	2634404.262
893	439680	355607.037	2634412.528
894	439700	355588.597	2634420.270
895	439720	355569.943	2634427.481
896	439740	355551.091	2634434.157
897	439760	355532.056	2634440.292
898	439780	355512.853	2634445.881

S.N.	Chainage	Centre line	
		Easting	Northing
899	439800	355493.498	2634450.918
900	439820	355474.008	2634455.401
901	439840	355454.397	2634459.325
902	439860	355434.683	2634462.687
903	439880	355414.880	2634465.485
904	439900	355395.005	2634467.715
905	439920	355375.075	2634469.377
906	439940	355355.106	2634470.469
907	439960	355335.113	2634470.991
908	439980	355315.114	2634470.940
909	440000	355295.124	2634470.319
910	440020	355275.161	2634469.126
911	440040	355255.239	2634467.364
912	440060	355235.376	2634465.034
913	440080	355215.585	2634462.155
914	440100	355195.859	2634458.855
915	440120	355176.179	2634455.296
916	440140	355156.516	2634451.636
917	440160	355136.855	2634447.970
918	440180	355117.194	2634444.304
919	440200	355097.533	2634440.638
920	440220	355077.872	2634436.972
921	440240	355058.211	2634433.306
922	440260	355038.549	2634429.640
923	440280	355018.888	2634425.974
924	440300	354999.227	2634422.308
925	440320	354979.566	2634418.642
926	440340	354959.905	2634414.976
927	440360	354940.244	2634411.310
928	440380	354920.583	2634407.644
929	440400	354900.921	2634403.978
930	440420	354881.260	2634400.312
931	440440	354861.599	2634396.646
932	440460	354841.938	2634392.980
933	440480	354822.277	2634389.314
934	440500	354802.616	2634385.648
935	440520	354782.955	2634381.982
936	440540	354763.293	2634378.316
937	440560	354743.632	2634374.650
938	440580	354723.971	2634370.985
939	440600	354704.310	2634367.319
940	440620	354684.649	2634363.653
941	440640	354664.988	2634359.987
942	440660	354645.326	2634356.321
943	440680	354625.665	2634352.655
944	440700	354606.004	2634348.989
945	440720	354586.343	2634345.323
946	440740	354566.682	2634341.657

S.N.	Chainage	Centre line	
		Easting	Northing
947	440760	354547.021	2634337.991
948	440780	354527.360	2634334.325
949	440800	354507.698	2634330.659
950	440820	354488.037	2634326.993
951	440840	354468.376	2634323.327
952	440860	354448.715	2634319.661
953	440880	354429.054	2634315.995
954	440900	354409.393	2634312.329
955	440920	354389.732	2634308.663
956	440940	354370.070	2634304.997
957	440960	354350.409	2634301.331
958	440980	354330.748	2634297.665
959	441000	354311.087	2634293.999
960	441020	354291.426	2634290.333
961	441040	354271.765	2634286.667
962	441060	354252.104	2634283.001
963	441080	354232.442	2634279.335
964	441100	354212.781	2634275.669
965	441120	354193.120	2634272.003
966	441140	354173.459	2634268.337
967	441160	354153.798	2634264.671
968	441180	354134.137	2634261.005
969	441200	354114.476	2634257.339
970	441220	354094.814	2634253.673
971	441240	354075.153	2634250.007
972	441260	354055.492	2634246.341
973	441280	354035.831	2634242.676
974	441300	354016.170	2634239.010
975	441320	353996.509	2634235.344
976	441340	353976.848	2634231.678
977	441360	353957.186	2634228.012
978	441380	353937.525	2634224.346
979	441400	353917.864	2634220.680
980	441420	353898.203	2634217.014
981	441440	353878.542	2634213.348
982	441460	353858.881	2634209.682
983	441480	353839.220	2634206.016
984	441500	353819.558	2634202.350
985	441520	353799.897	2634198.684
986	441540	353780.236	2634195.018
987	441560	353760.575	2634191.352
988	441580	353740.914	2634187.686
989	441600	353721.253	2634184.020
990	441620	353701.591	2634180.354
991	441640	353681.930	2634176.688
992	441660	353662.269	2634173.022
993	441680	353642.608	2634169.356
994	441700	353622.947	2634165.690

S.N.	Chainage	Centre line	
		Easting	Northing
995	441720	353603.286	2634162.024
996	441740	353583.625	2634158.358
997	441760	353563.963	2634154.692
998	441780	353544.302	2634151.026
999	441800	353524.641	2634147.360
1000	441820	353504.980	2634143.694
1001	441840	353485.319	2634140.028
1002	441860	353465.658	2634136.362
1003	441880	353445.997	2634132.696
1004	441900	353426.335	2634129.030
1005	441920	353406.674	2634125.364
1006	441940	353387.013	2634121.698
1007	441960	353367.352	2634118.032
1008	441980	353347.690	2634114.370
1009	442000	353328.009	2634110.812
1010	442020	353308.291	2634107.468
1011	442040	353288.537	2634104.343
1012	442060	353268.749	2634101.437
1013	442080	353248.930	2634098.752
1014	442100	353229.083	2634096.287
1015	442120	353209.209	2634094.042
1016	442140	353189.312	2634092.019
1017	442160	353169.393	2634090.217
1018	442180	353149.456	2634088.636
1019	442200	353129.502	2634087.277
1020	442220	353109.535	2634086.139
1021	442240	353089.556	2634085.224
1022	442260	353069.568	2634084.530
1023	442280	353049.574	2634084.059
1024	442300	353029.575	2634083.810
1025	442320	353009.576	2634083.783
1026	442340	352989.577	2634083.978
1027	442360	352969.581	2634084.396
1028	442380	352949.591	2634085.036
1029	442400	352929.610	2634085.897
1030	442420	352909.640	2634086.981
1031	442440	352889.682	2634088.286
1032	442460	352869.741	2634089.814
1033	442480	352849.818	2634091.562
1034	442500	352829.915	2634093.532
1035	442520	352810.035	2634095.723
1036	442540	352790.181	2634098.135
1037	442560	352770.355	2634100.767
1038	442580	352750.560	2634103.619
1039	442600	352730.797	2634106.691
1040	442620	352711.070	2634109.982
1041	442640	352691.381	2634113.493
1042	442660	352671.732	2634117.221

S.N.	Chainage	Centre line	
		Easting	Northing
1043	442680	352652.125	2634121.168
1044	442700	352632.564	2634125.333
1045	442720	352613.050	2634129.715
1046	442740	352593.585	2634134.313
1047	442760	352574.174	2634139.127
1048	442780	352554.816	2634144.157
1049	442800	352535.516	2634149.401
1050	442820	352516.276	2634154.860
1051	442840	352497.097	2634160.531
1052	442860	352477.982	2634166.416
1053	442880	352458.934	2634172.513
1054	442900	352439.955	2634178.821
1055	442920	352421.035	2634185.302
1056	442940	352402.125	2634191.816
1057	442960	352383.216	2634198.329
1058	442980	352364.306	2634204.843
1059	443000	352345.396	2634211.357
1060	443020	352326.487	2634217.871
1061	443040	352307.577	2634224.385
1062	443060	352288.668	2634230.899
1063	443080	352269.758	2634237.413
1064	443100	352250.849	2634243.927
1065	443120	352231.939	2634250.440
1066	443140	352213.030	2634256.954
1067	443160	352194.120	2634263.468
1068	443180	352175.211	2634269.982
1069	443200	352156.301	2634276.496
1070	443220	352137.392	2634283.010
1071	443240	352118.482	2634289.524
1072	443260	352099.573	2634296.037
1073	443280	352080.663	2634302.551
1074	443300	352061.754	2634309.065
1075	443320	352042.844	2634315.579
1076	443340	352023.935	2634322.093
1077	443360	352005.025	2634328.607
1078	443380	351986.116	2634335.121
1079	443400	351967.206	2634341.634
1080	443420	351948.297	2634348.148
1081	443440	351929.387	2634354.662
1082	443460	351910.478	2634361.176
1083	443480	351891.568	2634367.690
1084	443500	351872.659	2634374.204
1085	443520	351853.749	2634380.718
1086	443540	351834.840	2634387.232
1087	443560	351815.930	2634393.745
1088	443580	351797.021	2634400.259
1089	443600	351778.111	2634406.773
1090	443620	351759.202	2634413.287

S.N.	Chainage	Centre line	
		Easting	Northing
1091	443640	351740.292	2634419.801
1092	443660	351721.383	2634426.315
1093	443680	351702.473	2634432.829
1094	443700	351683.564	2634439.342
1095	443720	351664.654	2634445.856
1096	443740	351645.745	2634452.370
1097	443760	351626.835	2634458.884
1098	443780	351607.926	2634465.398
1099	443800	351589.016	2634471.912
1100	443820	351570.107	2634478.426
1101	443840	351551.197	2634484.939
1102	443860	351532.288	2634491.453
1103	443880	351513.378	2634497.967
1104	443900	351494.469	2634504.481
1105	443920	351475.559	2634510.995
1106	443940	351456.649	2634517.509
1107	443960	351437.740	2634524.023
1108	443980	351418.830	2634530.536
1109	444000	351399.921	2634537.050
1110	444020	351381.011	2634543.564
1111	444040	351362.102	2634550.078
1112	444060	351343.192	2634556.592
1113	444080	351324.283	2634563.106
1114	444100	351305.373	2634569.620
1115	444120	351286.464	2634576.134
1116	444140	351267.554	2634582.647
1117	444160	351248.645	2634589.161
1118	444180	351229.735	2634595.675
1119	444200	351210.825	2634602.185
1120	444220	351191.864	2634608.547
1121	444240	351172.750	2634614.433
1122	444260	351153.404	2634619.496
1123	444280	351133.789	2634623.378
1124	444300	351113.936	2634625.758
1125	444320	351093.957	2634626.543
1126	444340	351073.979	2634625.730
1127	444360	351054.125	2634623.355
1128	444380	351034.466	2634619.689
1129	444400	351015.003	2634615.093
1130	444420	350995.684	2634609.918
1131	444440	350976.429	2634604.511
1132	444460	350957.179	2634599.086
1133	444480	350937.929	2634593.661
1134	444500	350918.679	2634588.235
1135	444520	350899.429	2634582.810
1136	444540	350880.178	2634577.385
1137	444560	350860.928	2634571.960
1138	444580	350841.678	2634566.535

S.N.	Chainage	Centre line	
		Easting	Northing
1139	444600	350822.428	2634561.110
1140	444620	350803.178	2634555.685
1141	444640	350783.928	2634550.260
1142	444660	350764.678	2634544.834
1143	444680	350745.427	2634539.409
1144	444700	350726.177	2634533.984
1145	444720	350706.927	2634528.559
1146	444740	350687.677	2634523.134
1147	444760	350668.427	2634517.709
1148	444780	350649.177	2634512.284
1149	444800	350629.927	2634506.858
1150	444820	350610.676	2634501.433
1151	444840	350591.426	2634496.008
1152	444860	350572.176	2634490.583
1153	444880	350552.926	2634485.158
1154	444900	350533.676	2634479.733
1155	444920	350514.426	2634474.308
1156	444940	350495.176	2634468.883
1157	444960	350475.925	2634463.457
1158	444980	350456.675	2634458.032
1159	445000	350437.333	2634452.958
1160	445020	350417.665	2634449.361
1161	445040	350397.772	2634447.348
1162	445060	350377.781	2634446.931
1163	445080	350357.822	2634448.112
1164	445100	350338.020	2634450.885
1165	445120	350318.504	2634455.232
1166	445140	350299.397	2634461.124
1167	445160	350280.822	2634468.525
1168	445180	350262.898	2634477.386
1169	445200	350245.740	2634487.651
1170	445220	350229.457	2634499.255
1171	445240	350214.090	2634512.052
1172	445260	350198.702	2634524.823
1173	445280	350182.670	2634536.776
1174	445300	350166.031	2634547.870
1175	445320	350148.832	2634558.073
1176	445340	350131.120	2634567.357
1177	445360	350112.944	2634575.696
1178	445380	350094.355	2634583.068
1179	445400	350075.403	2634589.451
1180	445420	350056.142	2634594.829
1181	445440	350036.625	2634599.186
1182	445460	350016.906	2634602.510
1183	445480	349997.039	2634604.792
1184	445500	349977.079	2634606.026
1185	445520	349957.082	2634606.208
1186	445540	349937.103	2634605.338

S.N.	Chainage	Centre line	
		Easting	Northing
1187	445560	349917.198	2634603.418
1188	445580	349897.421	2634600.454
1189	445600	349877.828	2634596.453
1190	445620	349858.472	2634591.427
1191	445640	349839.407	2634585.390
1192	445660	349820.687	2634578.358
1193	445680	349802.362	2634570.351
1194	445700	349784.484	2634561.391
1195	445720	349767.102	2634551.503
1196	445740	349750.264	2634540.714
1197	445760	349734.017	2634529.055
1198	445780	349718.333	2634516.647
1199	445800	349702.739	2634504.123
1200	445820	349687.146	2634491.599
1201	445840	349671.553	2634479.075
1202	445860	349655.951	2634466.562
1203	445880	349639.951	2634454.566
1204	445900	349623.371	2634443.384
1205	445920	349606.253	2634433.044
1206	445940	349588.640	2634423.574
1207	445960	349570.576	2634414.995
1208	445980	349552.105	2634407.330
1209	446000	349533.275	2634400.597
1210	446020	349514.131	2634394.815
1211	446040	349494.722	2634389.996
1212	446060	349475.097	2634386.153
1213	446080	349455.304	2634383.296
1214	446100	349435.394	2634381.432
1215	446120	349415.414	2634380.565
1216	446140	349395.417	2634380.697
1217	446160	349375.451	2634381.827
1218	446180	349355.512	2634383.385
1219	446200	349335.572	2634384.942
1220	446220	349315.633	2634386.500
1221	446240	349295.694	2634388.058
1222	446260	349275.755	2634389.615
1223	446280	349255.815	2634391.173
1224	446300	349235.876	2634392.731
1225	446320	349215.937	2634394.289
1226	446340	349195.998	2634395.845
1227	446360	349176.053	2634397.336
1228	446380	349156.094	2634398.601
1229	446400	349136.113	2634399.477
1230	446420	349116.117	2634399.860
1231	446440	349096.118	2634399.743
1232	446460	349076.128	2634399.127
1233	446480	349056.160	2634398.011
1234	446500	349036.226	2634396.396

S.N.	Chainage	Centre line	
		Easting	Northing
1235	446520	349016.338	2634394.283
1236	446540	348996.510	2634391.674
1237	446560	348976.753	2634388.570
1238	446580	348957.079	2634384.973
1239	446600	348937.502	2634380.886
1240	446620	348918.033	2634376.310
1241	446640	348898.684	2634371.249
1242	446660	348879.468	2634365.706
1243	446680	348860.397	2634359.685
1244	446700	348841.482	2634353.188
1245	446720	348822.735	2634346.221
1246	446740	348804.169	2634338.787
1247	446760	348785.794	2634330.892
1248	446780	348767.622	2634322.540
1249	446800	348749.664	2634313.736
1250	446820	348731.933	2634304.485
1251	446840	348714.438	2634294.795
1252	446860	348697.190	2634284.670
1253	446880	348680.202	2634274.117
1254	446900	348663.482	2634263.143

S.N.	Chainage	Centre line	
		Easting	Northing
1255	446920	348647.042	2634251.755
1256	446940	348630.891	2634239.959
1257	446960	348615.041	2634227.763
1258	446980	348599.500	2634215.174
1259	447000	348584.272	2634202.210
1260	447020	348569.289	2634188.962
1261	447040	348554.446	2634175.557
1262	447060	348539.533	2634162.233
1263	447080	348523.754	2634149.951
1264	447100	348507.045	2634138.970
1265	447120	348489.512	2634129.360
1266	447140	348471.266	2634121.181
1267	447160	348452.426	2634114.486
1268	447180	348433.110	2634109.319
1269	447200	348413.488	2634105.456
1270	447220	348394.007	2634100.955
1271	447240	348374.947	2634094.911
1272	447260	348356.354	2634087.546
1273	447280	348337.835	2634079.993
1274	447300	348319.316	2634072.440

Schedule-B

Schedule-B

(SeeClause2.1)

Development of the Project Highway

1. Development of the Project Highway

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2. 4-Laning with paved shoulder

4 laning shall include Four-Laning of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

The Project Highway shall be designed and constructed in conformity with the Specifications and Standards specified in Annex-I of Schedule-D.

Annex- I
(Schedule-B)
Description of Project Road (Four-Laning)

[Note: Description of the Project Highway shall be given by the Authority in detail together with explanatory drawings (where necessary) to explain the Authority's requirements precisely in order to avoid subsequent changes in the Scope of the Project. The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for [Four Laning of Highways (IRC: SP:84-2019)], referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details, as required, should be provided in order to define the Scope of the Project clearly and precisely.]

1. Widening of the Existing Highway

(i) The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for [plain/rolling] terrain to the extent land is available.

(ii) Width of Carriageway

(a) Four-Laning with paved shoulders shall be undertaken. The paved carriageway shall be in accordance with the typical cross-sections' drawings in the manual IRC SP 84 - 2019. The typical drawings attached in schedules.

Provided that in the built-up areas [refer to paragraphs 2.1 (ii) (a) of the Manual and provide necessary details]: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location (Km to km)	Width (m)	Typical cross section (Ref. to Manual)
NIL				

(b) Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1(i) above

(c) The entire cross-sectional elements shall be accommodated in the proposed ROW. If required, suitable retaining structures shall be provided to accommodate the highway cross section within the proposed ROW and the same shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of the EPC Contract Agreement.

(d) On horizontal curves with radius up to 300 m, width of pavement and roadway in each carriageway shall be increased as per table 2.5 of IRC SP 84 -2018.

2. Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual (IRC: SP: 84-2019) for Plain & hilly terrain and as specified in Annex-I of Schedule D.

(ii) Design speed

The contractor shall adopt ruling design speed for designing the project highway in conformity with the provisions of the manual & as specified in Plan and Profile drawings of Annexure-III of Schedule-A and in Annex-I of Schedule D.

(iii) Improvement of the existing road geometrics

a) The bypass has been provided in following location

Sl. No	Existing Chainage (Km)		Existing Length (m)	Design Chainage (Km)		Design Length (m)
	Start	End		Start	End	
1	431+300	441+100	9800	429+600	436+900	7300

(a) Realignments and Geometric Improvement locations

Sl. No	Exist. Chainage		Exist. Length (m)	Design Chainage		Design Length (m)
	Start	End		Start	End	
1	421+850	431+300	9450	421+850	429+600	7750
2	441+100	454+570	13470	436+900	447+300	10400
	Total		22920			18150

(iv) Right of Way

[Refer to paragraph 2.3 of the Manual]. Details of the Right of Way are given in Annex II of Schedule-A.

(v) Type of shoulders

(a) In built-up section, footpaths are to be provided in the following stretches and as specified in Schedule-D.
(b) In open country, 2.0m wide paved shoulder and 1.5m wide earthen shoulder shall be provided on both side of median in plain terrain whereas 1.5m wide paved shoulder and 1.0m wide earthen shoulder shall be provided on valley side shall be provided (Hilly terrain).
(c) Design and specifications of shoulders shall conform to the requirements of Section 5 as specified in paragraphs 5.10 and 5.11 of the Manual. The Earthen Shoulder shall be compacted with 150mm thick granular sub-base quality material at the top duly stabilized with cement/suitable admixtures to prevent erosion.
(d) 1.0m wide separator shall be provided at all service road locations and grade separator locations.

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearance at underpasses and provision of guardrails/ crash barriers shall be as per the provision of relevant Manual.

(b) Lateral clearance: The width of the opening at the under passes shall be as follows:

S. No.	Location (Chainage) (from km to km)	Span/opening (m)	Remarks
1	422+075	1X20	VUP
2	422+855	1X12	LVUP
3	428+736	1X30	VUP
4	429+600	1X30	ONE SIDE VUP
5	431+192	1X12	LVUP
6	433+240	2X25	VUP
7	435+278	1X30	VUP
8	436+900	1X30	ONE SIDE VUP
9	438+000	1X12	LVUP
10	439+950	1X30	VUP
11	440+800	1X12	LVUP
12	442+462	1X20	VUP
13	443+310	1X12	LVUP
14	446+800	1X12	LVUP

(viii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpasses shall be as the provision of relevant Manual.

(b) Lateral clearance: The width of the opening at the overpasses shall be as follows:

S. No.	Location (Chainage) (from km to km)	Span/opening (m)	Remarks
Nil			

(ix) Service roads/Slip Road

7.0m wide Service roads/Slip Road shall be constructed at the locations and for the lengths indicated below: [Refer to the provision of relevant Manual and provided details]

S. N.	FROM	TO	LENGTH (KM)	REMARKS
1	421+850	422+075	0.225	Access to Mungiakami village
2	422+650	423+070	0.420	Mungiakami Elephant Camp
3	428+200	429+200	1.000	Access to Chakmaghat Dam
4	429+200	430+200	1.000	Teliamura Bypass start point
5	430+930	431+450	0.520	Access to Brahmanchara
6	432+500	433+700	1.200	NH-208 (Teliamura - Amarpur Section)
7	436+500	437+400	0.900	Teliamura Bypass End point
8	437+400	438+250	0.850	Access to Hawaibari
9	438+250	439+400	1.150	Access to various Junctions
10	439+400	440+300	0.900	Access to Hathai Koter Ecopark
11	441+860	442+650	0.790	Access to ONGC Plant (Baramura Gas Thermal Power Plant)
12	443+900	444+150	0.250	Access to Village
13	446+800	447+300	0.500	Access to Village
14	421+850	422+075	0.225	Access to Mungiakami village
15	422+650	423+070	0.420	Mungiakami Elephant Camp
Total		**2x9.705 = 19.410km**		

Note:- The above chainages are excluding of tapering the service road to join with main carriageway and all service road shall be tapered as per the provisions of Manual.

(x) Grade separated structures

(a) Grade separated structures shall be provided as per provision of the relevant Manual. The requisite particulars are given below:

[Refer to the provision of relevant Manual and provide details]

S. No.	Location of structure	Length (m)	Number and length of spans (m)	Remarks, if any
1	422+075	2x11m	1X20x5.5	VUP
2	422+855	2x11m	1X12x4.0	LVUP
3	428+736	2x12.1m	1X30X5.5	VUP
4	429+600	2x12.1m	1X30 X5.5	ONE SIDE VUP
5	431+192	2x12.1m	1X12x4.0	LVUP
6	433+240	2x12.1m	2X25 X5.5	VUP
7	435+278	2x12.1m	1X30 X5.5	VUP
8	436+900	2x12.1m	1X30 X5.5	ONE SIDE VUP
9	438+000	2x12.1m	1X12x4.0	LVUP
10	439+950	2x11m	1X30 X5.5	VUP
11	440+800	2x11m	1X12x4.0	LVUP
12	442+462	2x11m	1X20 X5.5	VUP
13	443+310	2x11m	1X12x4.0	LVUP
14	446+800	2x11m	1X12x4.0	LVUP

(e) In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as follows: [Refer to the provision of relevant Manual and specify the type of vehicular underpass/ overpass structure and whether the cross road is to be carried at the existing level, raised or lowered]

Sl. No.	Location	Type of structure Length(m)	Cross road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
1	422+075	Girder Type	*	*	*	VUP
2	422+855	Box Type	*	*	*	LVUP
3	428+736	Girder Type	*	*	*	VUP
4	429+600	Box Type	*	*	*	ONE
5	431+192	Box Type	*	*	*	LVUP
6	433+240	Girder Type	*	*	*	VUP
7	435+278	Girder Type	*	*	*	VUP
8	436+900	Girder Type	*	*	*	ONE
9	438+000	Box Type	*	*	*	LVUP
10	439+950	Girder Type	*	*	*	VUP
11	440+800	Box Type	*	*	*	LVUP
12	442+462	Girder Type	*	*	*	VUP
13	443+310	Box Type	*	*	*	LVUP
14	446+800	Box Type	*	*	*	LVUP

*Cross road levels shall be decided in accordance with the manual as per the requirement of main carriageway geometrics and the same shall be finalized in consultation with Authority's Engineer. It is clarified that, any raising or lowering of crossroad levels and development of approaches along crossroad is also covered under scope of this work and same will not attract change of scope.

(xi) Cattle, Animal and pedestrian underpass /overpass

Cattle and pedestrian underpass/overpass shall be constructed as follows: [Refer to provision of relevant Manual and specify the requirements of cattle and pedestrian underpass/overpass]

S. No.	Location	Span	Type of crossing
1	423+220	1x10m	Animal Underpass
2	426+325	1x10m	Animal Underpass

(xii) Typical cross-sections of the Project Highway

[Give typical cross-sections of the Project Highway by reference to the Manual]

As per attached Drawings

S.No	Description	Design Length (m)	Proposed TCS Type
1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)	1800	TCS 1
2	Fig:- 2.9 4 lane divided highway with service road with raised median (one side retaining wall & one side hill)	310	TCS 1A
3	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)	4580	TCS 2
4	Fig:- 2.9 4 lane divided highway with service road with raised median (both side retaining wall)	820	TCS 2A
5	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)	4130	TCS 3
6	Fig:- 2.9 4 lane divided highway with service road with raised median (both side Hill)	550	TCS 3A
7	Fig:- 2.3 4 lane divided highway road with Depressed median	3810	TCS 4
8	Fig:- 2.3 4 lane divided highway with service road with Depressed median	1275	TCS 4A
9	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses(Plain Terrain)	870	TCS 5
10	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Plain Terrain)	5345	TCS 5A
11	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses(Hilly Terrain)	755	TCS 6
12	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Hilly Terrain)	1205	TCS 6A
	Total Length (in m)	**25450**	

S.No.	From	To	Length (m)	TCS Type	Description TCS
1	421+850	421+890	40	TCS 1 A	Fig:- 2.9 4 lane divided highway with service road with raised median (one side retaining wall & one side hill)
2	421+890	422+075	185	TCS 6 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Hilly Terrain)
3	422+075	422+650	575	TCS 6	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses(Hilly Terrain)
4	422+650	423+070	420	TCS 6 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Hilly Terrain)
5	423+070	423+300	230	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
6	423+300	423+400	100	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
7	423+400	423+760	360	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
8	423+760	424+050	290	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
9	424+050	424+370	320	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
10	424+370	424+450	80	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
11	424+450	424+520	70	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
12	424+520	424+800	280	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
13	424+800	424+890	90	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
14	424+890	425+000	110	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
15	425+000	425+100	100	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
16	425+100	425+300	200	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
17	425+300	425+460	160	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
18	425+460	426+080	620	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
19	426+080	426+240	160	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
20	426+240	426+310	70	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
21	426+310	426+400	90	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)

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S.No.	From	To	Length (m)	TCS Type	Description TCS
22	426+400	426+600	200	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
23	426+600	426+700	100	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
24	426+700	426+800	100	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
25	426+800	427+840	1040	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
26	427+840	428+200	360	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
27	428+200	428+240	40	TCS 4 A	Fig:- 2.3 4 lane divided highway with service road with Depressed median
28	428+240	430+050	1810	TCS 5 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Plain Terrain)
29	430+050	430+200	150	TCS 4 A	Fig:- 2.3 4 lane divided highway with service road with Depressed median
30	430+200	430+930	730	TCS 4	Fig:- 2.3 4 lane divided highway road with Depressed median
31	430+930	431+450	520	TCS 5 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Plain Terrain)
32	431+450	432+500	1050	TCS 4	Fig:- 2.3 4 lane divided highway road with Depressed median
33	432+500	433+700	1200	TCS 5 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Plain Terrain)
34	433+700	434+830	1130	TCS 4	Fig:- 2.3 4 lane divided highway road with Depressed median
35	434+830	435+700	870	TCS 5	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses(Plain Terrain)
36	435+700	436+500	800	TCS 4	Fig:- 2.3 4 lane divided highway road with Depressed median
37	436+500	438+315	1815	TCS 5 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Plain Terrain)
38	438+315	439+400	1085	TCS 4 A	Fig:- 2.3 4 lane divided highway with service road with Depressed median
39	439+400	439+550	150	TCS 2 A	Fig:- 2.9 4 lane divided highway with service road with raised median (both side retaining wall)
40	439+550	440+150	600	TCS 6 A	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses with service road both side (Hilly Terrain)
41	440+150	440+470	320	TCS 3	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses(Hilly Terrain)

S.No.	From	To	Length (m)	TCS Type	Description TCS
42	440+470	440+650	180	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
43	440+650	440+690	40	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
44	440+690	440+870	180	TCS 6	Fig:- 7.8 cross section of grade separated structure & vehicular underpasses(Hilly Terrain)
45	440+870	441+400	530	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
46	441+400	441+860	460	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
47	441+860	441+930	70	TCS 1 A	Fig:- 2.9 4 lane divided highway with service road with raised median (one side retaining wall & one side hill)
48	441+930	442+450	520	TCS 2 A	Fig:- 2.9 4 lane divided highway with service road with raised median (both side retaining wall)
49	442+450	442+650	200	TCS 3 A	Fig:- 2.9 4 lane divided highway with service road with raised median (both side Hill)
50	442+650	442+790	140	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
51	442+790	443+200	410	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
52	443+200	443+510	310	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
53	443+510	443+600	90	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
54	443+600	443+700	100	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
55	443+700	443+900	200	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
56	443+900	444+000	100	TCS 3 A	Fig:- 2.9 4 lane divided highway with service road with raised median (both side Hill)
57	444+000	444+150	150	TCS 2 A	Fig:- 2.9 4 lane divided highway with service road with raised median (both side retaining wall)
58	444+150	444+880	730	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
59	444+880	445+010	130	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
60	445+010	445+070	60	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
61	445+070	445+310	240	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
62	445+310	445+410	100	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
63	445+410	445+580	170	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)

S.No.	From	To	Length (m)	TCS Type	Description TCS
64	445+580	445+900	320	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
65	445+900	446+170	270	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
66	446+170	446+270	100	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
67	446+270	446+360	90	TCS 1	Fig:- 2.9 4 lane divided highway with raised median (one side retaining wall & one side hill)
68	446+360	446+550	190	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
69	446+550	446+650	100	TCS 4	Fig:- 2.3 4 lane divided highway road with Depressed median
70	446+650	446+800	150	TCS 2	Fig:- 2.9 4 lane divided highway with raised median (both side retaining wall)
71	446+800	447+050	250	TCS 3 A	Fig:- 2.9 4 lane divided highway with service road with raised median (both side Hill)
72	447+050	447+100	50	TCS 3	Fig:- 2.9 4 lane divided highway with raised median (both side Hill)
73	447+100	447+300	200	TCS 1 A	Fig:- 2.9 4 lane divided highway with service road with raised median (one side retaining wall & one side hill)
Total Length (in m)			**25450**		

Typical Cross Sections

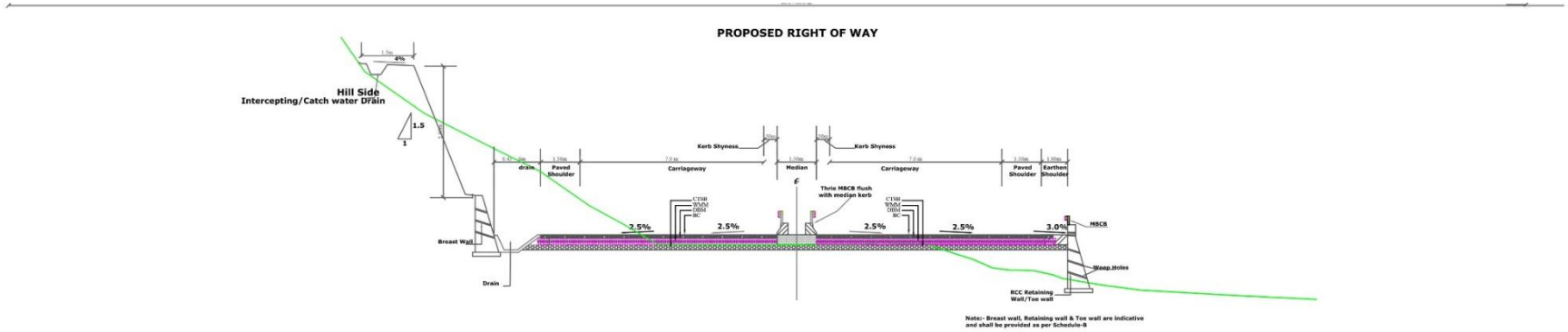


Fig 2.9 of IRC SP 84 2019
TCS-1
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with raised median one side retaining wall & one side hill

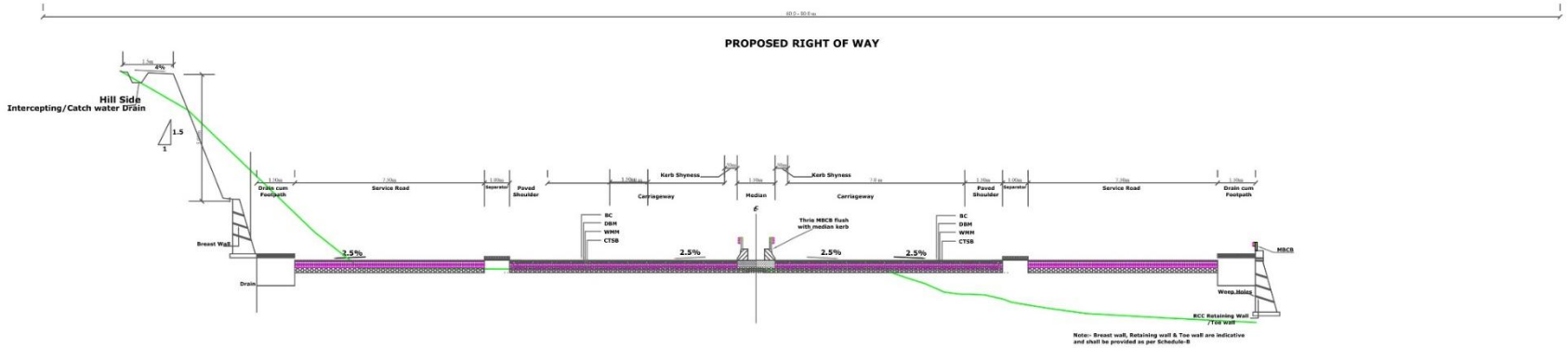


Fig 2.9 of IRC SP 84 2019
TCS-1A
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with service road with raised median one side retaining wall & one side hill

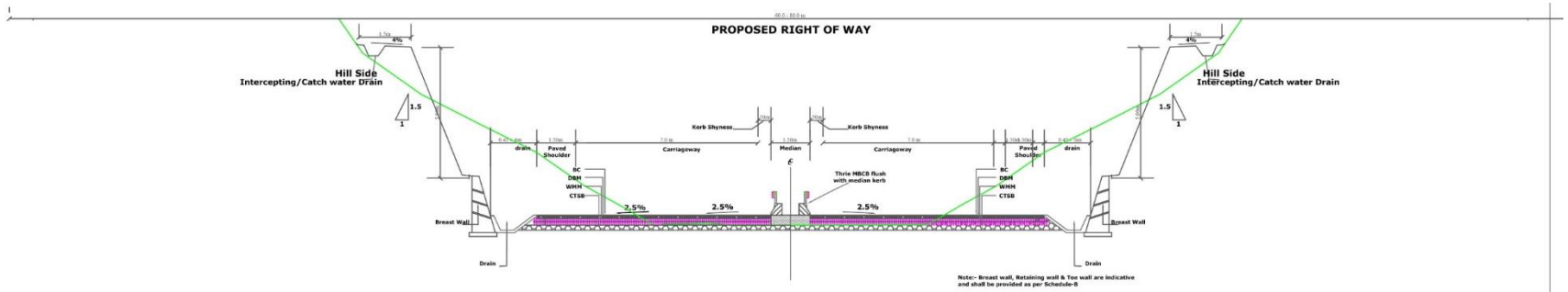


Fig 2.9 of IRC SP 84 2019
TCS-3
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with raised median both side hill

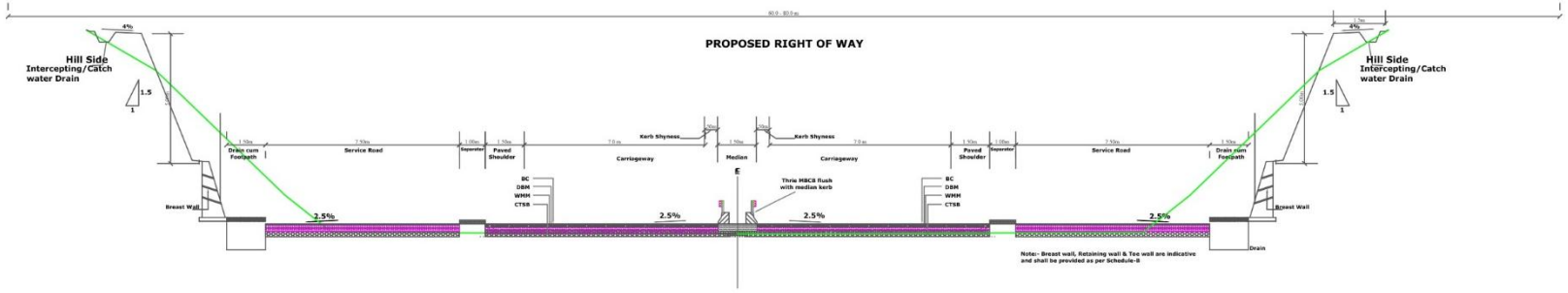


Fig 2.9 of IRC SP 84 2019
TCS-3A
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with service road with raised median both side hill

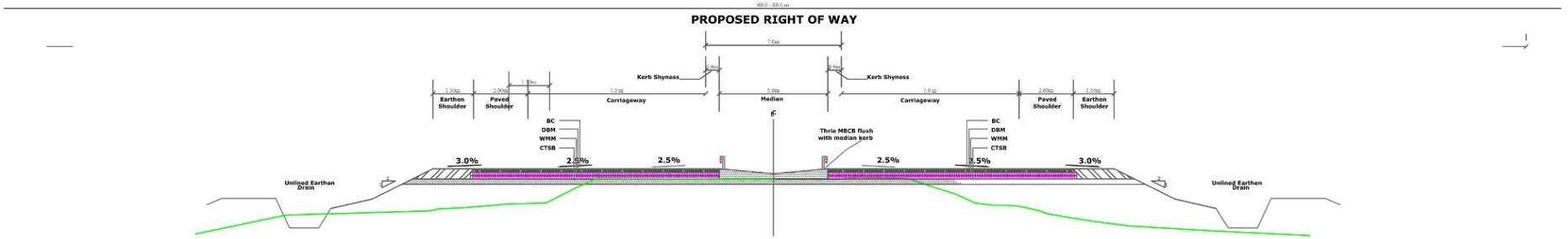


Fig 2.3 of IRC SP 84 2019
TCS-4
Typical Cross Section
(Open Country- Plain/Rolling Terrain)
4- lane divided carriageway with depressed median

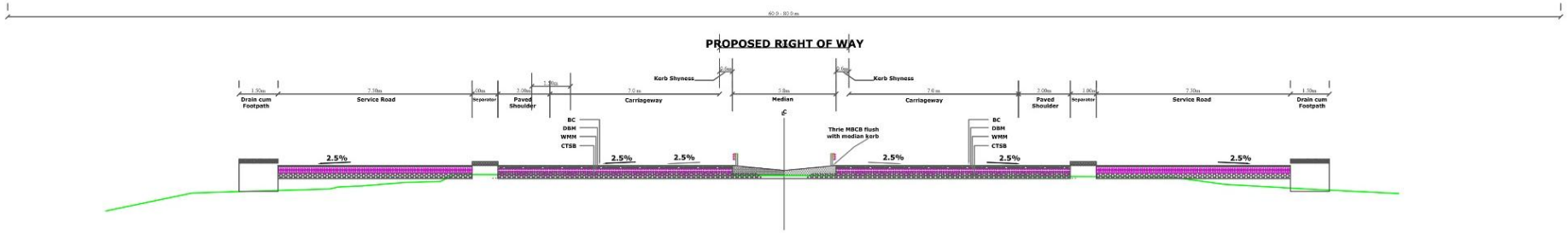
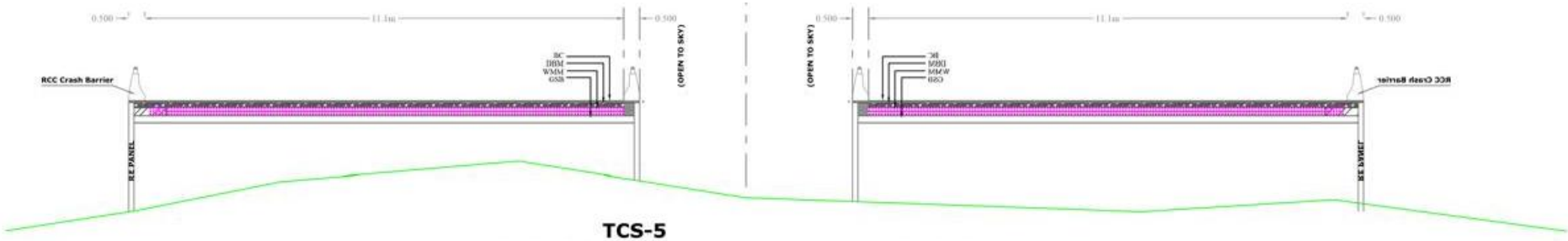
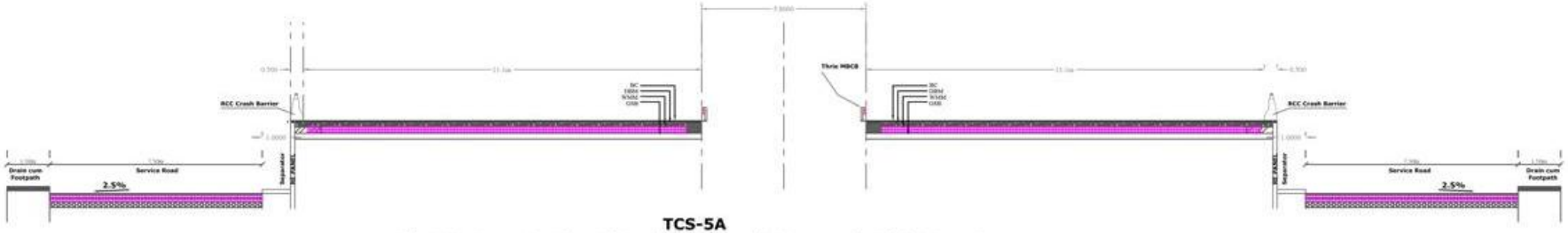


Fig 2.3 of IRC SP 84 2019
TCS-4A
Typical Cross Section
(Open Country- Plain/Rolling Terrain)
4- lane divided carriageway with depressed median



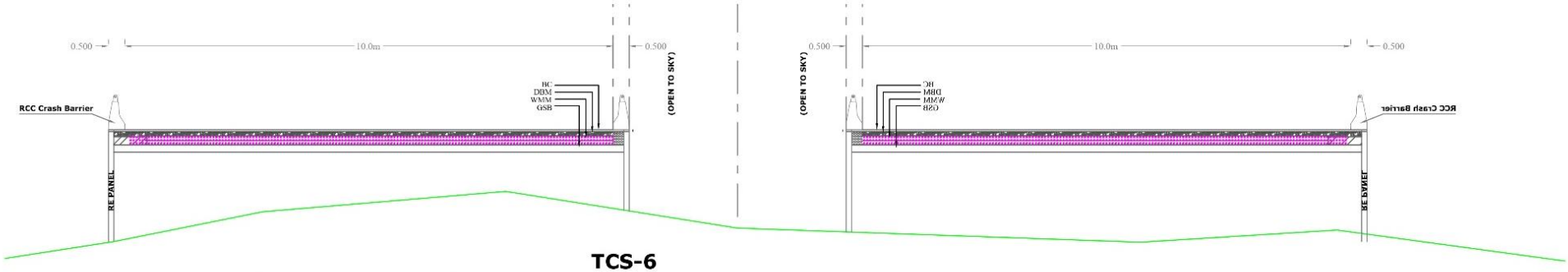
TCS-5

Fig: 7.8 Cross-Section of Grade Separated Structure in Plain Terrain
Vehicular Underpass and Elevated Section



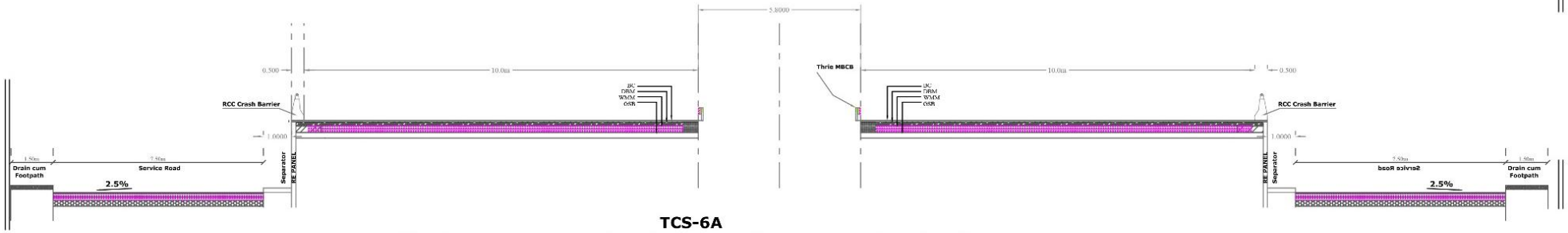
TCS-5A

Fig: 7.8 Cross-Section of Grade Separated Structure in Plain Terrain
Vehicular Underpass and Elevated Section with service road (Approach of Grade Separator)



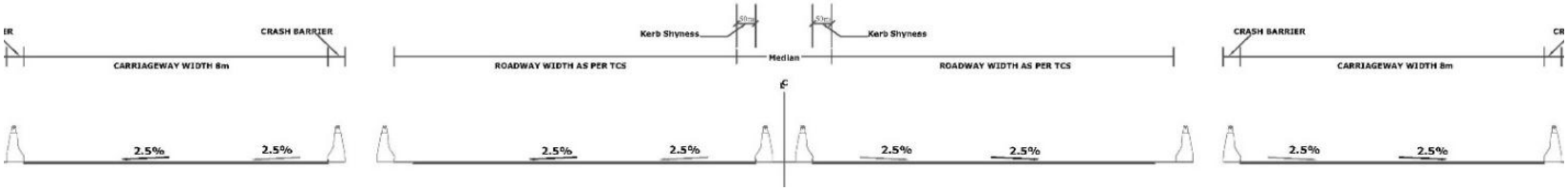
TCS-6

Fig: 7.8 Cross-Section of Grade Separated Structure in Hilly Terrain
Vehicular Underpass and Elevated Section

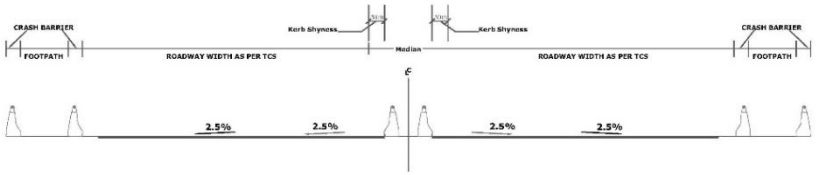


TCS-6A

Fig: 7.8 Cross-Section of Grade Separated Structure in Hilly Terrain
Vehicular Underpass and Elevated Section with service road (Approach of Grade Separator)

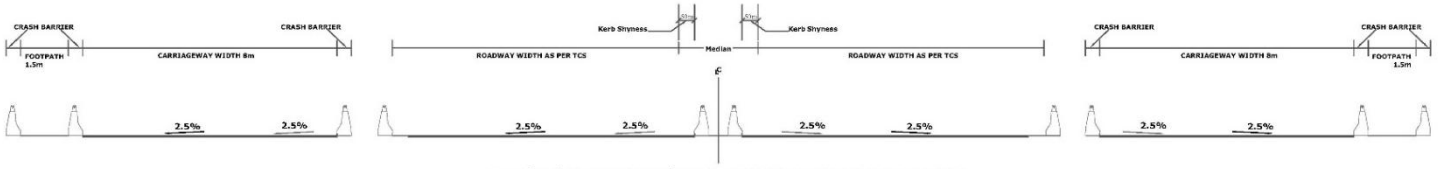


Typical Cross Section OF BOX CULVERT AT ROAD LEVEL
4-LANE DIVIDED HIGHWAY



Typical Cross Section OF BRIDGE AT ROAD LEVEL
4-LANE DIVIDED HIGHWAY WITH FOOTPATH

Typical Cross Section OF BRIDGE AT ROAD LEVEL
4-LANE DIVIDED HIGHWAY WITH SERVICE ROAD & WITHOUT FOOTPATH



Typical cross section of culvert at road level with service road

3. Intersections and Grade Separators

All intersections and grade separators shall be as per the provision of relevant Manual. Existing intersections which are deficient shall be improved to the prescribed standards.
[Refer to the provision of relevant Manual and specify the requirements. Explain where necessary with drawings/sketches/general arrangement]
Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(i) At-grade intersections

a. Major Intersections

S. No.	Existing Chainage	Design Chainage	TYPE of Junction (T,Y,X)	Type of Crossing (NH/SH/MDR/VR)	Side (LHS/RHS)	Detail of Destination of Junction	Remarks
1	431+380	429+600	Y-Type	Teliamura Bypass Start	RHS	To NH-8	Major
2	441+060	436+900	Y-Type	Teliamura Bypass End	RHS	To NH-8	Major

b. Minor Intersections

S. N.	CHAINAGE	TPYE OF JUNCTION	SIDE	LEADING TO
1	422+850	T	RIGHT	Mungiakami Elephant Camp
2	422+900	T	LEFT	To Village
3	423+000	Y	LEFT	To Village
4	424+000	Y	LEFT	To Pashkar Sarak
5	428+300	T	RIGHT	To Chakmaghat Colony
6	428+420	T	RIGHT	To Chakmaghat Colony
7	428+565	T	RIGHT	To Chakmaghat Colony
8	428+625	T	RIGHT	To Chakmaghat Colony
9	428+736	T	LEFT	To Chakmaghat Dam
10	428+770	T	RIGHT	To Chakmaghat Colony
11	429+120	Y	RIGHT	To Chakmaghat Colony
12	429+470	T	RIGHT	To Chakmaghat Colony
13	430+000	T	RIGHT	To Chakmaghat Colony
14	430+200	T	RIGHT	To Chakmaghat Colony
15	430+980	X	Both	R-Teliamura L-Kakrachara
16	431+192	X	Both	R-Teliamura L-Kakrachara
17	432+585	X	Both	To Village
18	432+790	X	Both	R-Teliamura L-Bhrmachara
19	433+140	X	Both	R-Teliamura L-Chandrapur
20	433+240	X	Both	R-Teliamura L-Chandrapur
21	433+700	X	Both	R-Gamaibari L-Kasiya Nangalpara
22	434+900	X	Both	To Village
23	435+015	X	Both	To Village
24	435+278	X	Both	R-Teliamura L-Rangamura
25	435+700	X	Both	R-Hawaibari L- Monirampara
26	436+130	X	Both	R-East Hawaibari L - Arjunsardarpada

S. N.	CHAINAGE	TPYE OF JUNCTION	SIDE	LEADING TO
27	437+110	T	RIGHT	Palpara
28	437+625	T	RIGHT	Kukibasti
29	437+780	T	LEFT	Charanmoni
30	439+350	Y	RIGHT	South Hadrai Adc
31	439+950	T	RIGHT	Hathaikotar Ecopark
32	442+440	X	Both	ONGC
33	443+350	X	Both	To Village
34	444+075	T	LEFT	To Village
35	446+800	T	RIGHT	Hathaikotar

(ii) Grade separated intersection with/without ramps

S. No.	Location of	Length	Number and length of	Remarks, if any
1	422+075	2x11m	1X20x5.5	VUP
2	422+855	2x11m	1X12x4.0	LVUP
3	428+736	2x11m	1X30X5.5	VUP
4	429+600	2x12.1m	1X30 X5.5	ONE SIDE VUP
5	431+192	2x12.1m	1X12x4.0	LVUP
6	433+240	2x12.1m	2X25 X5.5	VUP
7	435+278	2x12.1m	1X30 X5.5	VUP
8	436+900	2x12.1m	1X30 X5.5	ONE SIDE VUP
9	438+000	2x12.1m	1X12x4.0	LVUP
10	439+950	2x11m	1X30 X5.5	VUP
11	440+800	2x11m	1X12x4.0	LVUP
12	442+462	2x11m	1X20 X5.5	VUP
13	443+310	2x11m	1X12x4.0	LVUP
14	446+800	2x11m	1X12x4.0	LVUP

(ii) RE Wall at Grade separated intersection with/without ramps

From	To	Side	Total Length (in m)
421+890	422+065	Both Side	350
422+085	422+180	Both Side	190
422+360	422+849	Both Side	978
422+861	423+070	Both Side	418
428+240	428+721	Both Side	962
428+751	429+585	Both Side	1668
429+615	430+050	Both Side	870
430+930	431+186	Both Side	512
431+198	431+450	Both Side	504
432+500	433+215	Both Side	1430
433+265	433+700	Both Side	870
434+830	435+263	Both Side	866

From	To	Side	Total Length (in m)
435+293	435+700	Both Side	814
436+500	436+885	Both Side	770
436+915	437+994	Both Side	2158
438+006	438+315	Both Side	618
439+550	439+935	Both Side	770
440+030	440+150	Both Side	240
440+690	440+870	Both Side	360
Total Length (in m)			**15348m**

Note: The above locations are minimum. Additional locations if any required as per site condition shall be provided as per manual. It shall not be treated as change in scope of work.

4. Road Embankment and Cut Section

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/cuttings shall conform to the Specifications and Standards given in Section4 of the Manual and the specified cross-sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

Note: -

1. Disposal of extra earth (Muck) obtained by cutting & carriage of earth for filling from borrow area is sole responsibility of contractor.

2. Identification & finalization of muck disposal site/Borrow area is sole responsibility of contractor in consultation with Authority Engineer & without violating Guidelines of MoEFCC.

3. Any financial implication related to the muck disposal, muck disposal site & borrow area will not be considered as Change of Scope.

(ii) Raising of the existing road [Refer to the provision of relevant Manual and specify sections to be raised]

The existing road shall be raised in the following sections:

S. No.	Section (From km to km)	Length	Extent of raising [Top of finished road level]
Nil			

5. Pavement Design

(i) Pavement design shall be carried out in accordance with Section 5 of the Manual.

Homogenous Section (Km)			CBR (%)	MSA	Adopted Pavement Composition In Widening Position (mm)				Remarks
From	To	Length (in Km)		Adopted	BC	DBM	WMM	CTSB*	
421+850	447+300	25.450	7	30	40	55	150	200	Main carriageway
421+850	447+300	25.450	7	10	40	-	150	200	Service Road

**The recommended aggregate gradation [27] for the CTSB material is Grading IV of Table 400-1 of MoRTH Specifications and same shall be followed.

(ii) Type of pavement

[Refer to paragraph 5.1 of the Manual and state specific requirement, if any, of providing cement concrete pavement.]

Homogenous Section (Km)			Type of Pavement
From	To	Length (in Km)	
421+850	447+300	25.450	Flexible Pavement

(i) Design requirements

[Refer to the provision of relevant Manual and specify design requirements and strategy]

a) Design Period and strategy

Main Carriageway

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15 years. Stage construction shall not be permitted.

Service Road

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15 years. Stage construction shall not be permitted.

b) Design Traffic

Main Carriageway

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 30 million standard axles.

Service Road

Not with standing anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 10 million standard axles.

(ii) Reconstruction of stretches

[Refer to the provision of relevant Manual and specify the stretches, if any, to be reconstructed.]

The following stretches of the existing road shall be reconstructed. These shall be designed as new pavement.

S. No.	Stretch		Remark
	From km	To km	
1.	421+850	429+600	Reconstruction
2.	436+900	447+300	Reconstruction

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per the provision of relevant Manual.

a) PCC Catch water drain: 6520 m

S. No.	Chainage		Length (in m)	Side of Drain	Total Length (in m)
	From	To			
1	423+590	423+630	40	One Side	40
2	423+750	423+760	10	One Side	10

S.	Chainage		Length	Side of	Total Length
3	423+760	423+770	10	Both Side	20
4	423+770	423+810	40	Both Side	80
5	423+890	423+910	20	Both Side	40
6	423+930	424+030	100	Both Side	200
7	424+550	424+610	60	Both Side	120
8	424+650	424+800	150	Both Side	300
9	424+800	424+890	90	One Side	90
10	424+890	424+930	40	Both Side	80
11	425+310	425+450	140	Both Side	280
12	425+810	425+830	20	Both Side	40
13	425+850	425+870	20	Both Side	40
14	426+110	426+130	20	Both Side	40
15	426+530	426+550	20	Both Side	40
16	426+830	426+990	160	Both Side	320
17	427+030	427+050	20	Both Side	40
18	427+170	427+470	300	Both Side	600
19	427+550	427+670	120	Both Side	240
20	427+710	427+790	80	Both Side	160
21	432+590	432+630	40	Both Side	80
22	436+390	436+430	40	Both Side	80
23	436+570	436+590	20	Both Side	40
24	439+730	439+770	40	Both Side	80
25	440+090	440+110	20	Both Side	40
26	440+190	440+210	20	Both Side	40
27	440+290	440+310	20	Both Side	40
28	440+330	440+430	100	Both Side	200
29	440+590	440+630	40	Both Side	80
30	441+450	441+830	380	Both Side	760
31	442+530	442+770	240	Both Side	480
32	442+970	442+990	20	Both Side	40
33	443+210	443+430	220	Both Side	440
34	443+910	443+930	20	Both Side	40
35	443+990	444+030	40	Both Side	80
36	444+910	445+010	100	One Side	100
37	445+070	445+310	240	Both Side	480
38	445+430	445+550	120	Both Side	240
39	446+070	446+170	100	One Side	100
40	446+270	446+310	40	One Side	40
41	446+610	446+630	20	Both Side	40
42	446+810	446+890	80	Both Side	160
43	447+010	447+030	20	Both Side	40
44	447+050	447+070	20	One Side	20
Total Length (in m)					**6520m**

b) Hill Side Drain: 11470m

S. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
1	421850	421890	One Side	40
5	423070	423300	One Side	230
7	423400	423760	One Side	360
8	423760	424050	Both Side	580
10	424370	424450	One Side	80
12	424520	424800	Both Side	560

S. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
13	424800	424890	One Side	90
14	424890	425000	Both Side	220
15	425000	425100	One Side	100
17	425300	425460	Both Side	320
19	426080	426240	Both Side	320
20	426240	426310	One Side	70
22	426400	426600	Both Side	400
24	426700	426800	One Side	100
25	426800	427840	Both Side	2080
41	440150	440470	Both Side	640
42	440470	440650	One Side	180
46	441400	441860	Both Side	920
47	441860	441930	One Side	70
49	442450	442650	Both Side	400
50	442650	442790	Both Side	280
52	443200	443510	Both Side	620
54	443600	443700	One Side	100
55	443700	443900	Both Side	400
56	443900	444000	Both Side	200
59	444880	445010	One Side	130
61	445070	445310	Both Side	480
63	445410	445580	Both Side	340
65	445900	446170	One Side	270
67	446270	446360	One Side	90
71	446800	447050	Both Side	500
72	447050	447100	Both Side	100
73	447100	447300	One Side	200
			Total	**11470**

c) Rectangular Covered Drain (RCC Drain)

Sl. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
1	421+850	422+075	Both Sided	225
2	422+650	423+070	Both Sided	420
4	428+200	429+200	Both Sided	1000
5	429+200	430+200	Both Sided	1000
6	430+930	431+450	Both Sided	520
7	432+500	433+700	Both Sided	1200
9	436+500	437+400	Both Sided	900
10	437+400	438+250	Both Sided	850
11	438+250	439+400	Both Sided	1150
12	439+400	440+300	Both Sided	900
13	441+860	442+650	Both Sided	790
14	443+900	444+150	Both Sided	250
15	446+800	447+300	Both Sided	500
Total (in m)				**2x9705=19410**

Note:The above locations are minimum. Additional locations if any required as per site condition shall be provided as per manual. It shall not be treated as change in scope of work.

7. Design of Structures

ii. General

(a) All bridges, culverts and structures shall be designed and constructed in accordance with section 7 of the IRC SP 84-2019 and shall conform to the cross- sectional features and other details specified in this schedule. Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

(b) Width of the carriageway of new bridges shall be as follows:

Refer to paragraph 7.3 (ii) of the IRC SP 84-2019 and specified width of carriageway of all new four lane bridges shall have footpaths on either side. The cross-sectional features shall be as per Fig.7.6 of the IRC SP 84-2019.

(c) All bridges shall be high-level bridges.

(d) The structures shall be designed to carry utility services like electric cable, water pipeline, OFC etc. as per the requirement of site.

(e) Cross-section of the new culverts and bridges at deck level shall conform to the typical cross-sections given in section 7 of the Manual. Extra widening shall be provided for all Culverts/Bridges/Other structures in curved sections as per manual.

(f) IRC Class Special Vehicle loading shall be taken into account in the design of all structures.

iii. Culvert

Overall width of all culverts shall be equal to the roadway width of the approaches. All culverts shall be constructed as per Schedule-D.

a. Reconstruction of existing culverts:

The existing culverts at the following locations shall be re-constructed as new culverts:

S. No.	Desing Chainage	Existing Chainage	Existing Type	Proposed Type	Proposed Span	Remarks
1	423+426	423+980	slab	Box Culvert	1x3x3	
2	423+426	423+980	pipe	Box Culvert	1x3x3	
3	424+040	424+700	pipe	Box Culvert	1x3x3	
4	424+200	424+900	pipe	Box Culvert	1x3x3	
5	424+582	425+420	pipe	Box Culvert	1x3x3	
6	427+468	429+000	slab	Box Culvert	1x3x3	
7	428+212	429+990	pipe	Box Culvert	1x3x3	
8	428+425	430+250	slab	Box Culvert	1x3x3	
9	429+110	430+890	pipe	Box Culvert	1x3x3	
10	436+970	441+140	pipe	Box Culvert	1x3x3	
11	437+430	441+600	slab	Box Culvert	1x3x3	
12	437+825	442+000	slab	Box Culvert	1x3x3	
13	437+880	442+060	slab	Box Culvert	1x3x3	
14	438+390	442+565	pipe	Box Culvert	1x3x3	

Note:

- **The overall width of culverts shall be equal to Roadway width (Inner edge of Crash barrier to inner edge of crash barrier) with crash barrier on both sides of project highway including the gap between main carriageway & service road/slip/connecting road, in case there is any service road/slip/connecting road. Any additional Barrel length required as per site conditions shall not constitute a Change of Scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of EPC Contract Agreement.**
- **Location of culverts are indicative and span arrangement is minimum specified. Exact location of these culverts may be decided in consultation with Authority Engineer. The actual location/vent way/span arrangements of culverts shall be determined on the basis of detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in number of culverts/vent way/span arrangements specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of EPC Contract Agreement.**
- **All culverts shall be provided with approach slab & requisite protection works like chute, guide bandh, floor aprons.**

b. Widening of existing culverts

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in section 7.3 (i), (iii) and Fig. 7.1 to Fig. 7.5 of the IRC SP 84-2019. Repairs and strengthening of existing structures where required shall be carried out.

Sl.No	Chainage(km)	Span/Opening	Remarks ,ifany
Nil			

c. Additional new culverts

New culverts shall be constructed for width equal to the roadway width of the Project Highway & including width of crash barrier on both sides of the highway & as per typical cross-section given in this Schedule-B and alignment plan. The particulars are given in the table below:

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Propose Type	Proposed Span	Remarks
1.	-	422+500	Box Culvert	1x3x3	
2.	-	422+920	Box Culvert	1x3x3	
3.	-	423+680	Box Culvert	1x3x3	
4.	-	424+820	Box Culvert	1x3x3	
5.	-	425+500	Box Culvert	1x3x3	
6.	-	426+060	Box Culvert	1x3x3	
7.	-	426+350	Box Culvert	1x3x3	

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Propose Type	Proposed Span	Remarks
8.	-	426+750	Box Culvert	1x3x3	
9.	-	427+100	Box Culvert	1x3x3	
10.	-	427+880	Box Culvert	1x3x3	
11.	-	429+160	Box Culvert	1x3x3	
12.	-	429+550	Box Culvert	1x3x3	
13.	-	430+080	Box Culvert	1x3x3	
14.	-	430+960	Box Culvert	1x3x3	
15.	-	432+480	Box Culvert	1x3x3	
16.	-	432+780	Box Culvert	1x3x3	
17.	-	433+160	Box Culvert	1x3x3	
18.	-	433+540	Box Culvert	1x3x3	
19.	-	434+360	Box Culvert	1x3x3	
20.	-	434+720	Box Culvert	1x3x3	
21.	-	435+840	Box Culvert	1x3x3	
22.	-	436+320	Box Culvert	1x3x3	
23.	-	436+500	Box Culvert	1x3x3	
24.	-	437+340	Box Culvert	1x3x3	
25.	-	439+320	Box Culvert	1x3x3	
26.	-	439+700	Box Culvert	1x3x3	
27.	-	440+700	Box Culvert	1x3x3	
28.	-	440+960	Box Culvert	1x3x3	
29.	-	441+200	Box Culvert	1x3x3	
30.		442+240	Box Culvert	1x3x3	
31.		442+820	Box Culvert	1x3x3	
32.		443+580	Box Culvert	1x3x3	
33.		444+080	Box Culvert	1x3x3	
34.		445+020	Box Culvert	1x3x3	
35.		445+410	Box Culvert	1x3x3	
36.		445+840	Box Culvert	1x3x3	
37.		446+205	Box Culvert	1x3x3	
38.		446+925	Box Culvert	1x3x3	

Note:

- **The overall width of culverts shall be equal to Roadway width (Inner edge of Crash barrier to inner edge of crash barrier) with crash barrier on both sides**

of project highway including the gap between main carriageway & service road/slip/connecting road, in case there is any service road/slip/connecting road. Any additional Barrel length required as per site conditions shall not constitute a Change of Scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of EPC Contract Agreement.

- **Location of culverts are indicative and span arrangement is minimum specified. Exact location of these culverts may be decided in consultation with Authority Engineer. The actual location/vent way/span arrangements of culverts shall be determined on the basis of detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in number of culverts/vent way/span arrangements specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of EPC Contract Agreement.**
- **All culverts shall be provided with approach slab & requisite protection works like chute, guide bandh, floor aprons.**

d. Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

Sl. No.	Chainage (km)	Type of repair required
NIL		

e. Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

iv. Bridges

(a) Existing bridges to be re-constructed/widened/retain.

(i) The existing bridges at the following locations shall be re-constructed as new Structures:

S N	Desing Chanage (Km)	Existing Chainage (Km)	Type of structures (RCC Box, Pipe, Slab Box, Masonry Arch)	Span Arrangement (No. X Length) (m)	Width (m)	Proposal			
					Total (m)	Recommendation	Type	Span	Width (m)
1	437+175	441+350	T-Beam Girder	1x16	7.0	Reconstruction to 4 lane width	T-Beam	1x16	2x12.1
2	438+850	443+020	RCC Slab	1x12	7.0	Reconstruction to 4 lane width	RCC Solid Slab	1x16	2x12.1
3	446+717	453+720	PSC Girder	1x28	7.0	Reconstruction to 4 lane width	PSC Girder	1x30	2x14.1

Note:-Proposed span arrangement is minimum and the same shall be finalized as per site condition in accordance with the Manual in consent with the concerned authority. Any increase in length/span/height shall not be treated as change in scope of work.

(ii) The following narrow bridges shall be widened:

	Chainage (km)	Existing	Extent of	Cross-section at deck

No.		width (m)	widening (m)	level for widening @
NIL				

(b) New bridges

New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

Sl. No	Chainage (km)	Name of Nala/River	Square Span (m)	Width of Structure (m)
a) Major Bridge				
1	430+532	Khowai River	4x30	2x14.1
b) Minor Bridge				
1	431+380	-	1x10	2x12.1
2	431+820	-	1x16	2x14.1
3	432+015	-	1x20	2x14.1
4	433+835	-	1x10	2x14.1
5	433+925	-	1x10	2x14.1
6	434+300	-	1x10	2x14.1
7	435+080	-	1x16	2x12.1
8	435+250	-	1x20	2x12.1
9	436+640	-	1x10	2x12.1
C) Minor Bridge on Service Road				
1	431+380	-	1x10	2x11.0
2	436+640	-	1x10	2x11.0
3	437+175	-	1x16	2x11.0
4	438+850	-	1x16	2x11.0

Note: Proposed span arrangement is minimum and the same shall be finalized as per site condition in accordance with the Manual in consent with the concerned authority. Any increase in length/span/height shall not be treated as change in scope of work.

(c) The railings of existing bridges shall be replaced by crash barriers at the following locations:

Sl. No.	Chainage (km)	Remarks
Nil		

(d) Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

Sl. No.	Chainage (km)	Remarks
Nil		

(e) Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.21 of the manual

Structures in marine environment

Sl.No.	Chainage(km)	Remarks
Nil		

v. Rail-road bridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the manual.

(b) Road over-bridges

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD drawings attached.

Sl. No.	Chainage (km)	Length of bridge (m)
Nil		

vi. Road under-bridges

Road under-bridges (road under railway line) shall be provided at the following level crossings, as per GAD drawings attached:

Sl. No.	Location of Level Crossing (chainage	Number and length of span (m)
Nil		

vii. Grade separated structures.

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2 (ix) and 3 of this Annex-I.

viii. Repairs and strengthening of bridges and structures.

The existing bridges and structures to be repaired/strengthened, and the nature and extent of repairs /strengthening required are given below:

(a) Bridges

Sl. No.	Chainage (km)	Nature and extent of repairs / strengthening to be carried out
Nil		

(b) ROB/ RUB

Sl. No.	Chainage (km)	Nature and extent of repairs / strengthening to be carried out
NIL		

(c) Overpasses/Underpasses and other structures

Sl. No.	Chainage (km)	Nature and extent of repairs / strengthening to be carried out
Nil		

ix. List of Major Bridges and structures

The following is the list of the major Bridges and structures:

Sl. No.	Chainage (km)
Nil	

8. Traffic Control Devices and Road Safety Works

i. Traffic control devices and road safety works shall be provided in accordance with the provision of relevant Manual.

ii. Specifications of the reflective sheeting. [Refer to the provision of relevant Manual and specify]

9. Roadside Furniture

(i) Road side furniture shall be provided in accordance with the provisions of the relevant Manual.

(ii) Overhead traffic signs: at each village start and end border, etc.

[Refer to the provision of relevant Manual and provide details]

10. Compulsory Afforestation

[Refer to the provision of relevant Manual and specify the number of trees which are required to be planted by the Contractor as compensatory afforestation.]

11. Hazardous Locations

a. Thrie metal beam crash barrier shall be provided on both sides of median (Except Structure and viaduct locations) at following locations-

Sl. No.	Location stretch		Side	Total executable Length (m)
	From (km)	To (km)		
1	421+850	447+300	Both Sided	47148

b. Kerb Stone shall be provided on both sides of median (Except Structure and viaduct locations) at following locations-

Sl. No.	Location stretch		Side	Total executable Length (m)
	From (km)	To (km)		
1	421+850	447+300	Both Sided	77649

c. Thrie Metal Beam crash barriers shall also be provided at the following locations:

Sl. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
1	421+850	421+890	One Side	40
2	423+070	423+300	One Side	230
3	423+300	423+400	Both Side	200
4	423+400	423+760	One Side	360

5	424+050	424+370	Both Side	640
6	424+370	424+450	One Side	80
7	424+450	424+520	Both Side	140
8	424+800	424+890	One Side	90
9	425+000	425+100	One Side	100
10	425+100	425+300	Both Side	400
11	425+460	426+080	Both Side	1240
12	426+240	426+310	One Side	70
13	426+310	426+400	Both Side	180
14	426+600	426+700	Both Side	200
15	426+700	426+800	One Side	100
16	427+840	428+200	Both Side	720
17	439+400	439+550	Both Side	300
18	440+470	440+650	One Side	180
19	440+650	440+690	Both Side	80
20	440+870	441+400	Both Side	1060
21	441+860	441+930	One Side	70
22	441+930	442+450	Both Side	1040
23	442+790	443+200	Both Side	820
24	443+510	443+600	Both Side	180
25	443+600	443+700	One Side	100
26	444+000	444+150	Both Side	300
27	444+150	444+880	Both Side	1460
28	444+880	445+010	One Side	130
29	445+010	445+070	Both Side	120
30	445+310	445+410	Both Side	200
31	445+580	445+900	Both Side	640
32	445+900	446+170	One Side	270
33	446+170	446+270	Both Side	200
34	446+270	446+360	One Side	90
35	446+360	446+550	Both Side	380
36	446+650	446+800	Both Side	300
37	447+100	447+300	One Side	200
Total Length(in m)				12910

d. **Concrete crash barrier on structure approaches with Friction slab**

i. Concrete crash barrier on both outer sides of structure approaches with friction slab has been provided at following locations:-

Summary of Concrete Crash Barrier on outer edge of structures

From	To	Side	Total Length (in m)
421+890	422+065	Both Side	350
422+085	422+180	Both Side	190
422+360	422+849	Both Side	978
422+861	423+070	Both Side	418
428+240	428+721	Both Side	962
428+751	429+585	Both Side	1668

From	To	Side	Total Length (in m)
429+615	430+050	Both Side	870
430+930	431+186	Both Side	512
431+198	431+450	Both Side	504
432+500	433+215	Both Side	1430
433+265	433+700	Both Side	870
434+830	435+263	Both Side	866
435+293	435+700	Both Side	814
436+500	436+885	Both Side	770
436+915	437+994	Both Side	2158
438+006	438+315	Both Side	618
439+550	439+935	Both Side	770
440+030	440+150	Both Side	240
440+690	440+870	Both Side	360
Total Length (in m)			**15348m**

ii. Other than above locations at following locations concrete crash barrier shall be provided on central part of structures –

Summary of Concrete Crash Barrier on both sides of Median

Start	End	Type of Structure	Length of Crash Barrier
422+065	422+085	VUP	4x20=80
422+849	422+861	LVUP	4x12=48
428+721	428+751	VUP	4x 30=120
429+585	429+615	One Sided VUP	2x 30=60
431+186	431+198	LVUP	4x12=48
433+215	433+265	VUP	4x 50=200
435+263	435+293	VUP	4x 30=120
436+885	436+915	One Sided VUP	2x 30=60
437+994	438+006	LVUP	4x12=48
439+935	439+965	VUP	4x 30=120
440+794	440+806	LVUP	4x12=48
442+452	442+472	VUP	4x20=80
443+304	443+316	LVUP	4x12=48
446+794	446+806	LVUP	4x12=48

12. SPECIAL REQUIREMENT FOR HILL ROADS

[Refer to paragraphs 14.5 and 14.8 of the Manual and provide details where relevant and required.]

Special requirement for hill roads in accordance with the provisions of section 14 of the manual shall be provided in the following locations: -

a) Viaduct

Viaduct at the following locations have been proposed due to depth of fill more than 12.0m

VIADUCT LOCATIONS			
S.N.	**FROM**	**TO**	**LENGTH (M)**
1	422+180	422+360	180
2	423+280	423+380	100

VIADUCT LOCATIONS			
S.N.	**FROM**	**TO**	**LENGTH (M)**
3	424+090	424+130	40
4	424+470	424+510	40
5	425+190	425+250	60
6	439+970	440+030	60
7	440+450	440+530	80
8	440+650	440+690	40
9	440+870	440+930	60
10	441+930	442+030	100
11	442+350	442+450	100
12	443+110	443+170	60
13	444+210	444+290	80
14	444+550	444+670	120
15	444+720	444+760	40
16	445+650	445+730	80
Total			1240

Note: - Viaduct shall be designed and provided as per the technical requirement in consultation with the Authority Engineer subject to minimum length of 1240 meter. Increase in length of viaduct will not be treated as change of Scope.

b) **RCC Retaining Wall with parapet wall: -** Retaining wall shall be constructed with parapet wall at the following locations-

Sl. No.	Location stretch		Side	Height (m)	Total Length (m)
	From (m)	To (m)			
1	422+070	422+090	Both Side	8	40
2	422+110	422+150	Both Side	9	80
3	422+390	422+430	Both Side	9	80
4	422+450	422+600	Both Side	8	300
5	422+670	422+710	Both Side	9	80
6	423+110	423+270	Both Side	9	320
7	424+050	424+090	One Side	9	40
8	425+130	425+190	One Side	8	60
9	427+870	427+930	Both Side	9	120
10	439+670	439+710	Both Side	8	80
11	439+850	439+970	Both Side	10	240
12	440+030	440+090	Both Side	8	120
13	440+530	440+550	One Side	9	20
14	440+930	440+970	Both Side	10	80
15	441+610	441+730	Both Side	7	240
16	441+860	441+930	One Side	8	70
17	442+035	442+345	Both Side	10	620
18	442+805	442+875	Both Side	5	140
19	443+070	443+110	Both Side	5	80
20	443+170	443+190	Both Side	7	40
21	443+510	443+650	Both Side	5	280
22	444+070	444+210	Both Side	5	280
23	444+290	444+550	Both Side	10	520
24	444+670	444+710	Both Side	10	80
25	444+770	444+790	Both Side	10	40
26	445+590	445+650	Both Side	7	120

Sl. No.	Location stretch		Side	Height (m)	Total Length (m)
	From (m)	To (m)			
27	445+730	445+870	Both Side	8	280
28	446+650	446+700	Both Side	9	100
29	446+740	446+800	Both Side	10	120
Total Length (m)					**4670**

Note: - Retaining wall shall be designed and provided as per the technical requirement in consultation with the Authority Engineer subject to minimum length of 4670 meter. Increase in length of Retaining wall will not be treated as change of Scope.

c) **RCC Toe Wall with pitching: -** the minimum height of Toe wall above ground level is 2.0m and same shall be constructed with stone pitching at the following locations-

TOE WALL			
FROM	**TO**	**LENGTH (m)**	**Remarks**
422+000	422+060	120	Both Side
422+430	422+450	40	Both Side
422+600	422+660	120	Both Side
422+750	423+090	680	Both Side
424+130	424+170	80	Both Side
424+250	424+350	200	Both Side
425+090	425+100	10	One Side
425+100	425+130	60	Both Side
425+250	425+290	80	Both Side
425+890	426+070	360	Both Side
426+330	426+390	120	Both Side
427+910	427+970	120	Both Side
428+130	428+170	80	Both Side
428+320	429+060	1480	Both Side
429+240	430+000	1520	Both Side
430+260	430+500	480	Both Side
430+560	430+620	120	Both Side
430+860	431+600	1480	Both Side
432+450	432+510	120	Both Side
432+700	432+900	400	Both Side
433+120	433+220	200	Both Side
433+340	433+980	1280	Both Side
434+840	435+640	1600	Both Side
436+470	436+530	120	Both Side
436+620	437+120	1000	Both Side
437+720	438+140	840	Both Side
Total		**12710m**	

Note: - Toe wall shall be designed and provided as per the technical requirement in consultation with the Authority Engineer subject to minimum length of 12710 meter. Increase in length of Toe wall will not be treated as change of Scope.

d) **RCC Breast wall**

i. **Following is the details of RCC Breast wall which is 1.5m high above Ground Level**

Sl. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		

Sl. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
1	423+490	423+510	One side	20
2	423+550	423+570	One side	20
3	423+570	423+590	One side	20
4	423+630	423+650	One side	20
5	423+710	423+750	One side	40
6	423+910	423+930	Both side	40
7	424+530	424+550	Both side	40
8	424+610	424+650	Both side	80
9	424+930	424+990	Both side	120
10	425+610	425+690	Both side	160
11	425+750	425+810	Both side	120
12	425+830	425+850	Both side	40
13	426+090	426+110	Both side	40
14	426+130	426+170	Both side	80
15	426+470	426+530	Both side	120
16	426+550	426+570	Both side	40
17	426+990	427+010	Both side	40
18	427+050	427+070	Both side	40
19	427+150	427+170	Both side	40
20	427+470	427+550	Both side	160
21	427+670	427+710	Both side	80
22	427+790	427+810	Both side	40
23	432+630	432+650	Both side	40
24	436+230	436+250	Both side	40
25	436+550	436+570	Both side	40
26	440+170	440+190	Both side	40
27	440+210	440+230	Both side	40
28	440+270	440+290	Both side	40
29	440+310	440+330	Both side	40
30	440+810	440+830	Both side	40
31	441+290	441+330	Both side	80
32	441+410	441+450	Both side	80
33	441+830	441+850	Both side	40
34	442+930	442+970	Both side	80
35	442+990	443+010	Both side	40
36	443+430	443+450	Both side	40
37	443+730	443+770	Both side	80
38	443+970	443+990	Both side	40
39	444+890	444+910	One side	20
40	445+050	445+070	Both side	40
41	445+310	445+330	Both side	40
42	445+550	445+570	Both side	40
43	445+890	445+900	Both side	20
44	445+900	445+910	Both side	20
45	445+990	446+070	One side	80
46	446+230	446+250	Both side	40
47	446+310	446+350	One side	40
48	446+470	446+490	Both side	40
49	446+950	447+010	Both side	120
50	447+030	447+050	Both side	40

Sl. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
51	447+070	447+090	One side	20
			Total	**= 2760m**

ii. Following is the details of RCC Breast wall which is 3.0m high above Ground Level

No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
1	423+590	423+630	One side	40
2	423+750	423+760	One side	10
3	423+760	423+770	Both side	20
4	423+770	423+810	Both side	80
5	423+890	423+910	Both side	40
6	423+930	424+030	Both side	200
7	424+550	424+610	Both side	120
8	424+650	424+800	Both side	300
9	424+800	424+890	One side	90
10	424+890	424+930	Both side	80
11	425+310	425+450	Both side	280
12	425+810	425+830	Both side	40
13	425+850	425+870	Both side	40
14	426+110	426+130	Both side	40
15	426+530	426+550	Both side	40
16	426+830	426+990	Both side	320
17	427+030	427+050	Both side	40
18	427+170	427+470	Both side	600
19	427+550	427+670	Both side	240
20	427+710	427+790	Both side	160
21	432+590	432+630	Both side	80
22	436+390	436+430	Both side	80
23	436+570	436+590	Both side	40
24	439+730	439+770	Both side	80
25	440+090	440+110	Both side	40
26	440+190	440+210	Both side	40
27	440+290	440+310	Both side	40
28	440+330	440+430	Both side	200
29	440+590	440+630	Both side	80
30	441+450	441+830	Both side	760
31	442+530	442+770	Both side	480
32	442+970	442+990	Both side	40
33	443+210	443+430	Both side	440
34	443+910	443+930	Both side	40
35	443+990	444+030	Both side	80
36	444+910	445+010	One side	100
37	445+070	445+310	Both side	480
38	445+430	445+550	Both side	240
39	446+070	446+170	One side	100
40	446+270	446+310	One side	40
41	446+610	446+630	Both side	40

No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
42	446+810	446+890	Both side	160
43	447+010	447+030	Both side	40
44	447+050	447+070	One side	20
Total				**= 6520m**

Note: - 1. Breast wall shall be designed and provided as per the technical requirement in consultation with the Authority Engineer subject to minimum length of 9280 meter. Increase in length of Breast wall will not be treated as change of Scope.
2. For Height of Breast Wall following parameters shall be adopted: -
(a) For cutting height of hill side slopes till 10m – minimum height of breast wall should be 1.5m above GL.
(b) For cutting height of hill side slopes above 10m – minimum height of breast wall should be 3.0m above GL.

e) Hydro seeding & Mulching

S. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
1	423+590	423+630	One side	40
2	423+750	423+760	One side	10
3	423+760	423+770	Both side	20
4	423+770	423+810	Both side	80
5	423+890	423+910	Both side	40
6	423+930	424+030	Both side	200
7	424+550	424+610	Both side	120
8	424+650	424+800	Both side	300
9	424+800	424+890	One side	90
10	424+890	424+930	Both side	80
11	425+310	425+450	Both side	280
12	425+810	425+830	Both side	40
13	425+850	425+870	Both side	40
14	426+110	426+130	Both side	40
15	426+530	426+550	Both side	40
16	426+830	426+990	Both side	320
17	427+030	427+050	Both side	40
18	427+170	427+470	Both side	600
19	427+550	427+670	Both side	240
20	427+710	427+790	Both side	160
21	432+590	432+630	Both side	80
22	436+390	436+430	Both side	80
23	436+570	436+590	Both side	40
24	439+730	439+770	Both side	80
25	440+090	440+110	Both side	40
26	440+190	440+210	Both side	40
27	440+290	440+310	Both side	40
28	440+330	440+430	Both side	200
29	440+590	440+630	Both side	80
30	441+450	441+830	Both side	760
31	442+530	442+770	Both side	480
32	442+970	442+990	Both side	40
33	443+210	443+430	Both side	440
34	443+910	443+930	Both side	40
35	443+990	444+030	Both side	80
36	444+910	445+010	One side	100
37	445+070	445+310	Both side	480
38	445+430	445+550	Both side	240

S. No.	Location stretch		Side	Total Length (m)
	From (km)	To (km)		
39	446+070	446+170	One side	100
40	446+270	446+310	One side	40
41	446+610	446+630	Both side	40
42	446+810	446+890	Both side	160
43	447+010	447+030	Both side	40
44	447+050	447+070	One side	20
				6520m

Note: - Hydro seeding & Mulching are provided as per the technical requirement in consultation with the Authority Engineer subject to minimum length of 6520 meter. Increase in length of Hydro seeding & Mulching shall not be treated as change of Scope.

13. Change of Scope

The length of Structures and bridges specified here in above shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

14. Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specification of concerned Utility Owning Department is part of the scope of work of the Contractor/Concessionaire*. The bidders may visit the site and assess the quantum of shifting of utilities for the projects before submission of their bid. Copy of utility relocation plan is enclosed. The specification of concerned Utility Owning Department shall be applicable and followed.

Notes:

a) The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of utility owning department and it is to be agreed solely between the contractor/Concessionaire* and the utility owning department. No change of scope shall be admissible and no cost shall be paid for using different type/spacing/size/specifications in shifted work in comparison to those in the existing work or for making any overhead crossing to underground as per requirement of utility owning department and/or construction of project highway. The contractor/concessionaire* shall carry out joint inspection with utility owning department and get the estimates from the utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of contractor/concessionaire* to utility owning department whenever asked by the contractor/concessionaire*. The decision/ approval of utility owning department shall be on the contractor/concessionaire*.

b) The supervision charges at the rates/charges applicable of the utility owning department shall be paid directly by the Authority to the utility Owning department as and when contractor/concessionaire*furnishes demand of utility Owning Department along with a copy of estimated cost given by later.

c) The dismantled material/scrap of existing Utility to be shifted/Dismantled shall belong to the contractor/concessionaire* who would be free to dispose-off the dismantled material as deemed fit by them unless the contractor/concessionaire* is required to deposit

the dismantled material may be availed by the contractor/concessionaire* as per estimate agreed between them.

d) The utilities shall be handed over after shifting work is completed to utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after Handing over Process is complete as far as utility shifting works are concerned.

Schedule B-1

Sl. No.	Description of Items	Quantity	Unit
A	**Electrical Utilities**		
1	Detailed survey of route alignment with covering of existing lines, Distribution Sub-Stations, submission of route alignment, profile and final survey with profile in details indicating road crossing, river, water body, SCAOA OFC cable, water supply pipe line, Gas pipe line and P&T line etc	33.83	Km
2	Supply of 1 Core, 6.35/11 KV, t20 Sq. mm. XLPE insulated Power Cable (Havels/polycab)	10.64	Km
3	Supply of 1 Core, 1.'I KV, 120 Sq. mm. 1tPE insulated Power Cable (Havels/polycab)	12.08	Km
4	Supplying and making outdoor Heat Shrink type End Termination Jointing kit for XLPE insulated Cable of grade 6.35/11 KV{E), 1-core, 120 Sq.mm.Size.	204	Set
5	Supplying and making Heat Shrink type straight through jointing kit for XLPE insulated Cable of grade 6.35/11 KV(E), 3-core, 120 Sq.mm. Size.	18	Set
6	Supplying and making outdoor Heat Shrink type End Termination Jointing Kit for XLPE insulated Cable of grade 1.1 KV(E), 1-core, 12o Sq.mm.Size.	228	Set
7	Supplying and making Heat Shrink type straight through jointing kit for XLPE insulated Cable of grade 1.1 KV(E), 1- core, 120 Sq.mm. size.	18	Set
8	T-shaped Pillar for cable line ID MARKING engraved with caption "POWER CABLE.LINE" (made of pre-cast RCC) of size(Pillar-3 ft. X 0.33 ft. X 0.33 ft.) and {T-section-3 ft.X0.33 ft.) by excavating earth including required painting of the of the engraved caption in black over yellow background as per technical requ:rement, direction of the Engineer-in-Charge.	116	Nos
9	100 mm dia GI Pipe as per ISS 1239	15508	Mtr
10	Errection of the following		
a	Excavation of Cable entry pit and Laying and Commissioning of 1 Core, 6.35/11 KV, 120 sqmm XLPE insulated armoured Power Cable direct into earth including excavation of earth upto a depth of 1200 mm (Width of the trench 40 cm.) including 1s- cia,s brick pro:ection of Mo layer flat brick soling , 300 mm. sand (River sand) cushioning and refilling and ramming the excavated soil as per direction of Engineer- in-charge and coiling of excess cable below the earth surface at a depth of minimum 1100 mm with protecting by double layer bricks soiling or as per sice requirement of TSECL.	2160	Mtr
a1	Excavation of Cable entry pit and Laying and Commissioning of 1 Core, 6.35/11 KV, 120 sqmm XLPE Insulated armoured Power Cable direct into earth including excavation of earth upto a depth of 1200 mm (Width of the trench 40 cm.) including 1st class brick protection of two layer flat brick soling, 300 mm. sand (River sand) cushioning and refilling and ramming the excavated soil as per direction of Engineer- in-charge and coiling of excess cable below the earth surface at a depth of minimum 1100 mm with protecting by double layer bricks soiling or as per site requirement of TSECL.	2000	mtr
b	Boring for Laying of 100 mm outer dia Gl pipe direct into the earth of 1100 mm depth below the ground surface with out effecting the existing road by manually digging/drilling b horizontally or diagonally direction for road crossing/Water supply line/Telecomunication line/Gas Pipe line etc. as per direction of Engineering In Charge	7480	mtr

Sl. No.	Description of Items	Quantity	Unit
c	Drawing and Commissioning of 1 Core, 6.35/11 KV, 120- 3005q. mm. XLPE Insulated Power Cable through Gl pipe c above ground levelfor risers to Transformers HT Side HT over Head Line HT Feeder Pillar (Kiosk) as per direction of Engg In Charge.	1440	mtr
d	Boring for Drawing and Commissioning of 1 Core, 6.35/11 KV, 120-3005q. mm. XLPE 1100 mm below the earth surface through Gl pipe by manually as per direction of Engineering InCharge.	5040	mtr
e	Erection of T-shaped Pillar for cable line ID MARKING engraved with caption "POWER CABLE.LINE" (made of pre- cast RCC) of size (Pillar-3 ft. X 0.33 ft. X 0.33 ft.) and (T- section-3 ft.X0.33 ft.) by excavating earth including required painting of the of the engraved caption in black over yellow background as per technical requirement, direction of the Engineer-in-Charge. The Pillar shall be embedded in earth by 1.5 ft. for 11 KV UG Cable.	96	Nos
f	Excavation of Cable entry pit and Laying and Commissioning of 1 Core, 1.1 KV, 120-300sqmm. XLPE insulated armoured Power Cable direct into earth including excavation of earth upto a depth of 1200 mm (Width of the trench 40cm.) including 1st class brick protection of two layer flat brick f soling, 300 mm. sand (River sand)cushioning and refilling and ramming the excavated soil as per direction of Engineer in charge and colling of excess cable below the earth surface at a depth of minimum 1100 mm with protection bydouble layer bricks solling or as per site requirement of TSECL	2520	mtr
g	Drawing and Commissioning of 1 Core, 1.1 KV, 120-3005q. mm. XLPE insulated Power Cable through Gl pipe above ground levelfor risers to Transformers LT Side LT over Head Line LT Feeder Pillar (Kiosk) as per direction of Engg in Charge	1680	mtr
h	Boring for Drawing and Commissioning of 1 Core, 1.1 KV, h120-3005q. mm. XLPE insulated Power Cable 1100 mm below the earth surface through Gi pipe by manually as per direction of Engineering inCharge.	5880	mtr
11	Design, Engineering, Manufacture, Assembly, Inspection, testing at manufacturer's work before dispatch, packing, supply & delivery of 12 Mtr. Long Gi Swaged Tubular Pole coforming to relevent IS standard with latest amendments and as per TSECL's tender specification.		
a	12 mtr long Gl Swaged Tubular Pole (Tare including @18% GHT)	122	Nos
12	Erection of 12.0 mtr. long Gl Swaged Tubular pole (Disignation 410:SP-60) conforming to ISS 2713 (P-1 & II) 1980, with round shape base plate welded at the 12 bottom direct in earth including excavation, refilling and ramming etc. as required complete (1/6th of the length of the pole to be embedded in earth) as per direction of the Engineer-in-Charge.	122	Nos
13	Design Engineering, Manufacture, Assembly, Inspection, testing at manufacturer's work before 13 dispatch, packing, supply & delivery of 11 Mtr. Long Gi Swaged Tubular Pole coforming to relevent IS standard with latest amendments and as per TSECL's tender specification.		
a	11 mtr long Gl Swaged Tubular Pole (Rate includind @18% GHT)	1227	Nos
14	Erection of 11 mtr. long Gi Swaged Tubular pole (Disignation 410:SP-60) conforming to ISS 2713 (P-1 & 11) 1980, with round shape base plate welded at the 14 bottom direct in earth including excavation, refilling 133 and ramming etc. as required complete (1/6th of the length of the pole to be embedded in earth) as per	1227	Nos

Sl. No.	Description of Items	Quantity	Unit
	direction of the Engineer-in-Charge.		
15	Design Engineering, Manufacture, Assembly, Inspection, testing at manufacturer's work before dispatch, packing, supply & delivery of 9 Mtr. Long Gi Swaged Tubular Pole coforming to relevent IS standard with latest amendments and as per TSECL's tender specification.		
a	19 mtr long Gi Swaged Tubular Pole (Rate Including @18% GHT)	453	Nos
16	Erection of 9 mtr. long Gi Swaged Tubular pole (Disignation 410:SP-60) conforming to ISS 2713 (P-1 & II) 1980, with round shape base plate welded at the 16 bottom direct in earth including excavation, refilling 202 and ramming etc. as required complete (1/6th of the length of the pole to be embedded in earth) as per direction of the Engineer-in-Charge.	453	Nos
17	Design. Engineering, Manufacture, Assembly, Inspection, testing at manufacturer's work before dispatch, packing, supply & delivery of 8 Mtr. Long Gi Swaged Tubular Pole coforming to relevent IS standard with latest amendments and as per TSECL's tender specification.		
a	8 mtr long Gi Swaged Tubular Pole (Rate including @18% GHT)	170	Nos
18	Erection of 8 mtr. long Gi Swaged Tubular pole (Disignation 410:SP-60) conforming to ISS 2713 (P-1 & 11) 1980, with round shape base plate welded at the bottom direct in earth including excavation, refilling and ramming etc. as required complete (1/6th of the length of the pole to be embedded in earth) as per direction of the Engineer-in-Charge.	170	Nos
19	8 mtr long PCC Pole	45	Nos
20	Erection of 8.0 mtr. long PCC Pole.	45	Nos
21	Painted stay set complete (for HT & LT line)	1238	Set
22	Galvanized stranded stay wire (7/2.5 mm)	6140	Kg
23	11 KV Stay Insulator	701	Nos
24	LT Stay Insulator	537	Nos
25	Strain screw	73	Nos
26	Erection of painted stay set complete direct in earth with 16 mm. dia. 1.8 mtr. long painted stay rod, anchor plate of size 300 X 300 X 8 mm, thick, turn buckle of length 356 mm. with 300 mm. long threaded adjustable 16 mm. dia. MS rod, thimble, guy insulator as per IS specification, hot dip (heavy duty) galvanized stay stranded wire of size 7/2.5 mm. fastened with 26 stay clamps as required. (including supply of MS clamp & Nuts & Bolts as reqd) and grouting of stay set with CC of ratio 1:2:4 (1 cement: 2 river sand: Jhama brick aggregate of 20 mm. nominal size) i/c supply of cement, sand and brick aggregate complete with excavation, refilling of earth, ramming along with centering and shuttering as required (@0.119 Cum perstay set as per TSECL specification)	1238	Set
27	11 KV GO Switch, 3-phase.	97	Set
28	Erection of 11 KV DOF Set of three nos l/c necessary connection complete as per Technical Specification	97	Set
29	11 KV DO Fuse, 3-phase.	97	Set
30	Erection of 11 KV DOF Set of three nos l/c necessary connection	97	Set

Sl. No.	Description of Items	Quantity	Unit
	complete as per Technical Specification		
31	11 KV Polymeric Lightening Arrestor.	97	Set
32	Erection of 9 KV, 5 KA single pole metal oxide gapless surge type LA suitable for nominal system voltage of 11 KV, 3 phase, 50 Hz, AC supply. Normal Creepage distance 600 mm, conforming to ISS:3070/1993 (Set of 3 (three) nos.)	420	Set
33	ACSR DOG (6/7/4.72/1.57 mm)	148.14	Km
34	ACSR DOG (6/7/4.72/1.57 mm)	148.14	Km
35	8 SWG GI Wire	10.17	kg
36	Laying, hoisting & stringing of 8 SWG G.I. wire as per ISS: 280/1978 amended latest with heavy coating as per 155: 48261 1968 of tensile strength 55 to 95 Kgf/mm l/c fastening with cross arm & metallic parts for earth continuity wire and metal parts to earth electrode as per direction of the Engineer-in-Charge.	90	Km
37	Design, Manufacture, Testing at works, supply, delivery & Transportation of D.O.F./G.O.S. mounting support channel Cross arm (75x40x40x6 mm) 2.8 mtr, long duly galvanized as per IS with latest amendments.	328	Nos
38	Erection of 2.8 mtr long made of 75x40x40x6 mm. Galvanized Channel for S/S G.O.S., D.O.F. as per direction of the Engineer-in-Charge.	328	Nos
39	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting channel Cross arm (100x50x50x6 mm) 2.8 mtr. lang duly galvanized as per IS with latest amendments.	248	Nos
40	Erection of 2.8 mtr long made of 100x50x50x6 mm. 40 Galvanized Channel for transformer base as per direction of the Engineer-in-Charge.	176	Nos
41	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting channel Cross arm (100x50x50x6 mm) 0.8 mtr. long duly galvanized as per IS with latest amendments	158	Nos
42	Erection of 0.8 mtr long made of 100x50x50x6 mm. 42 Galvanized Channel for transformer base as per direction of the Engineer-in-Charge.	158	Nos
43	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm (65x65x6 mm) 2.8 mtr. long duly galvanized as per IS with latest amendments	94	Nos
44	Erection of 2.8 mtr long made of 65x65x6 mm. 44 Galvanized angle for Cross arm for GOS handle bracket as per direction of the Engineer-in-Charge.	94	Nos
45	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm (65x65x6 mm) 3.2 mtr. long duly galvanized as per IS with latest amendments.	56	Nos
46	Erection of 3.2 mtr long made of 65x65x6 mm. Galvanized angle for Cross arm for Sub-Station Guard bracket as per direction of the Engineer-in-Charge.	56	Nos
47	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting Chennel Cross arm (75x40x40x6 mm) 0.3 mtr. long duly galvanized as per IS with latest amendments.	922	Nos
48	Erection of 0.3 mtr long 11KV S.P. Top Cross arm i/c clamp, nut & bolts etc. by 75X40X40X6 mm Galvanized Channel	922	Nos

Sl. No.	Description of Items	Quantity	Unit
49	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting Chennel Cross arm (75x40x40x6 mm) 1.5 mtr. long duly galvanized as per IS with latest amendments.	922	Nos
50	Erection of 1.5 mtr long 11KV S.P. Top Cross arm l/c 50 clamp, nut & bolts etc. by 75X40X40X6 mm Galvanized Channel	922	Nos
51	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm (65x65x6 mm) 1.65 mtr. long duly galvanized as per IS with latest amendments.	922	Nos
52	Erection of 1.65 mtr long 11 KV S.P. Guard Cross arm /c clamp, nut & bolts etc. by 65X65X6 mm MS Angle	922	Nos
53	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting Channel Cross arm (75x40x40x6mm) 2.2 mtr. long duly galvanized as per IS with latest amendments.	260	Nos
54	Erection of 2.2 mtr long 11KV D.P. Cross arm I/c. 54 clamp, nut & bolts etc. by 75X40X40X6 mm MS Channel	260	Nos
55	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm (65x65x6 mm) 2.5 mtr. long duly galvanized as per 15 with latest amendments.	260	Nos
56	Erection of 2.5 mtr long 11 KV D.P. Guard Cross arm 56 l/c clamp, nut & bolts etc. by 65X65X6 mm Galvanized Angle	260	Nos
57	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm for DP (65x65x6 mm) 3.2 mtr. long duly galvanized as per IS with latest amendments.	368	No
58	Erection of 3.2 mtr long 11 KV D.P. Guard Cross arm 58 l/c clamp, nut & balts etc, by 65X65X6 mm Galvanized Angle	368	Nos
59	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm for DP (65x65x6 mm) 1.6 mtr. long duly gaivanized as per IS with latest amendments.	368	No
60	Erection of 1.6 mtr long 11 KV D.P. Guard Cross arm /c clamp, nut & bolts etc. by 65X65X6 mm Galvanized Angle	368	Nos
61	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm (65x65x6 mm) 2.2 mtr. long 6-wire LT "C" Bracket duly galvanized as per IS with latest amendments.	68	No
62	Erection of 6-Wire LT C-bracket i/c clamp, nut & bolts etc. by 65X65X6 mm Galvanized Angle	54	Nos
63	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle 63 Cross arm (65x65x6 mm) 1.2 mtr. long 4-wire LT Bracket duly galvanized as per 15 with latest amendment	302	No
64	Erection of 1.2 mtr. long 4-Wire LT bracket in/c clamp, nut & bolts etc. by 65X65X6 mm Galvanized Angle	302	Nos
65	Design, Manufacture, Testing at works, supply, delivery & Transportation of Transformer mounting angle Cross arm (65x65x6 mm) 0.55 mtr. long 2-wire LT Bracket duly galvanized as per 15 with latest amendments.	542	No
66	Erection of 0.55 mtr. Long 2-Wire LT C-bracket i/c clamp, nut & bolts etc. by 65X65X6 mm MS Angle	542	Nos

Sl. No.	Description of Items	Quantity	Unit
67	11 KV polimeric Disc Insulator	1472	Nos
68	11 KV Disc Fittings	1472	Nos
69	Erection of Disc Insulator Ball and Socket type l/c fittings for 11 KV system (EMS-45 KN) conforming to ISS:731/1971 in angle and dead end locations including 69 tension fittings of EMS-45 KN to accommodate the relevant ACSR conductor size along with nuts and bolts, washer etc. as required in complete as per direction of the Engineer-in-Charge.	1472	Nos
70	11 KV Polimeric Pin insulator i/c. Gi Pin	3543	No
71	Erection of 11 KV Polimeric Pin insulator including G. Pin for 11 KV system with mechanical strength of 10 KN conforming to 155:731/1971 with hot dip galvanized M.S forged 11 KV G.I pin alongwith galvanized hexagonal nuts, G.I flat washer and G.I spring washer conforming to 155: 2486(P-111/1974 etc. as required in complete as por direction of the fingineer-in-Charge.	3543	Nos
72	Laying, hoistinging & stringing of LT AB Cable (3X70 +1x50-1x16 sq, mm) including binding, jumpering, etc. as required & as per direction of the Engineer-in-Charge.	183	Km
a	LT AB Cable (3x35 +1x16+1x25 sq. mm)	4	Km
b	Positioning of cable drum removing of cable from drum and laying, stringing, holsting & drawing of All cable 1.1 KV LT AB Cable (3x35 +1x16+1x25 sq. mm) along with pre-insulated mid span jointing sleeves /c installation of all accessories as per direction of Engg-In-Charge.	4	Km
73	Suspension clamp Assembly with straps & Buckle (25-35 mm)	451	No
74	Dead end clamp Assembly with straps & Buckle (25-35 mm)	211	No
75	Service anchore clamp	391	No
76	Bimetallic Lugs for 35 sq. mm	880	No
77	Pre-insulated Jointing Sleeve 35 sq. mm	220	No
78	Distribution Box three phase (25-35 mm)	466	No
79	Insulation Piecing Connector Main 16-95 Sq. mm & Tap 4 to 35 Sq. mm	2354	No
80	Cable end cap (25-35 mm)	450	No
81	Cable end cap (25-35 mm)	220	No
82	Eye Hook (25 mm)	471	No
83	Pole clamp (25/50 mm)	495	No
84	Non Metalic "Helical ties" for covered conductor, 25 sq. mm	988	Nos
85	Insulation Piecing Connector Main 120 Sq. mm & Tap 4 to 35	205	No
86	LT Shackle insulator (4X4.5")	377	Nos
87	Erection of Porcelain Shackle Insulator (4x4.5") for LT system with mechanical strength of 5 KN conforming 87 to ISS:731/1971 with hot dip galvanized M.S G.I Straps with bolts in complete (suitable for Rabbit/DOG conductor) as per direction of the Engineer-In-Charge	377	Nos
88	Supply and installation of Earth Spike unit the item include 20mm dia 1.8 mtr long Gi Earth rod i/c Connecting clamps, bolts etc. along with drawing of Earth Wire (8 SWG GI Wire) from Earth Spike to Metal Parts of Pole Structure and Excavation of Earth refilling ramming etc as reqd as ser direction of the Engineer- in-Charge	370	Nos

Sl. No.	Description of Items	Quantity	Unit
89	Supply and erection of earthing set as per 155: 3043 of 1966 and with latest amendment if army, 2.5 mtr long G. pipe (15 marked of 40 mm diameter with suitable holes on pipe circumference including a pale of clampa Emade of 50 X 6 mm M.S. flat, galvanized nuts & bolts alongwith alternate layers of salt & charcoal including supply of 4.0 mtr long, 12mm dia PVC pipe for each earthing set etc, as required and as per direction of the Engineer-In-Charge	328	Set
90	25 KVA, 3-phase, 11/0.443 KV Distribution Transformer	4	Nos
91	Erection & Commissioning of 25 KVA, 3-phase, 11/3.443 KV Distribution Transformer on pole structure at a height of 2440 mm (approx) above GL in double MS Channel support (100X50X50X6 mm Channell with all necessary accessories and fittings as per Technical Specification.	8	Nos
92	63 KVA, 3-phase 11/0-443 KV Distribution Transformer	6	Nos
93	Erection & Commissioning of 63 KVA, 3-phase, 11/0443 KV Distribution Transformer on pole structure at a height of 2440 mm (approx) above GL In double MS channel support (100X50X50X6 mm Channel with all necessary accessories and fittings as per Technical Specification.	12	Nos
94	100 KVA, 3-phase, 11/0,443 KV Distribution Transformer	49	Nos
95	Erection & Commissioning of 100 KVA, 3-phase 11/0.443 KV Diatribution Transformer on pole structure at a height of 2640 mm (approx) above Gu in double MS channel support (100x50x50x6 mm channel) with all necessary accessories and fittings as per Technical Specification	50	Nos
96	200 KVA, 3-phase, 11/0.443 CV Ostribution Transformer	1	Nos
97	Erection & Commissioning of 200 KVA, 3-phase 11/0.443 KV Distribution Transformer on pole structure at a height of 2440 mm (approx) above GL in double MS channel support (100X50X50X6 mm channel) with all necessary accessories and fittings as per Technical Specification.	1	Nos
98	500 KVA, 3-phase, 11/0.443 KV Distribution Transformer	1	Nos
99	Erection & Commissioning of 500 KVA, 3-phase 11/0.443 KV Distribution Transformer on pole 99 structure at a height of 2440 mm (approx) above GL in double MS channel support (100X50X50X6 mm channel) with all necessary accessories and fittings as per Technical Specification.	1	Nos
100	400 Amps Cut-Out	9	Nos
101	300 Amps Cut-Out	6	Nos
102	200 Amps Cut-Out	120	Nos
103	100 Amps Cut-Out	178	Nos
104	240 sqmm. PVC Cable	60	Mtr
105	185 sqmm, PVC Cable	60	Mtr
106	120 sqmm. PVC Cable	1760	Mtr
107	70 sqmm PVC Cable	1120	Mtr
108	240 sqmm. Bi-metallic Lugs	26	Nos
109	185 sqmm. Bi-metallic Lugs	26	Nos
110	120 sqmm, Bi-metallic Lugs	715	Nos
111	70 sqmm. Bi-metallic Lugs	380	Nos
112	Nuts & Bolts (Assorted Size)	6145.6	Kg
113	Straps with Nuts & Bolts.	160	Pair
114	D-Clamp	202	Nos

Sl. No.	Description of Items	Quantity	Unit
115	4 sq mm PVC Cable	26.7	km
116	10 sq mm PVC Cable	9.1	km
117	Making connection from Transformer LT side to overhead LT Line via fuse unit of unarmored PVC cable 1100-V grade conforming to 155: 1554 (P-1)/1988 of the following sizes and the cables shall be properly crimped by bi-metallic lugs at contact areas as per direction of the Engineer-in-Charge.	88	Job
118	Erection of Protective Guarding by 8 SWG GI Wire as per technical specification along with 11 KV Line across road/river/telecom line etc. in horizontal formation complete	2884	Nos
119	Danger Plate (HT)	1264	Nos
120	Danger Plate (LT)	623	Nos
121	Erection of Danger Plate on HT/LT Poles	1887	Nos
122	Barbed Wire	3704	kg
123	Supply & erection of Anti-climbing devices viz barbed wire on existing pole structures including supply of barbed wire confirming to 15:278 having four points barbed spaced 75 (+/-12) mm apart shall be wrapped helically with a pitch of 75 mm around the limb of support and firmly commencing from the height of 3.5 Mand up to 5 or 6 M (1.5 Kg./pole) as per direction of the Engineer-in-Charge	1942	Nos
124	Fabricated bracket clamp of assorted size of 50X6 mm Galvalized Flat	6983	Nos
125	Supply and erection of galvanized stay clamp l/c Nuts Bolts etc as read	9392	Pair
126	Polythin pipe, 1/2" dia	2110	Mtr
127	Grouting with CC of ratio 1:2:4 (1 cement: 2 river sand 4 jhama brick aggregate of 20 mm. nominal size) ilc supply of cement, sand and brick aggregate complete with excavation, refilling of earth, ramming alongwith centering and shuttering as required (@0.273 Cum per Steel Tubular Pole & @ 0.119 Cum per Stay Set as per TSECL specification etc.	586.504	Cum
128	Supply & erection of wooden plank (preferably karal wood) of size 24" x 10" x 1.5" for fitting, fixing of LT cut 128 outs along with MS clamps, nuts & bolts and cable connections with termination by Lugs as per Specification.	112	Nos
129	Supply & erection of fabricated copper strip size of 50x8 mm, 20 cm long with 4 nos hole to connect the cable/OT LT Stud as required as per direction of the Engineering-in-Charge.	200	Nos
130	Providing Sub-Station protective fencing made by chain link mesh of & SWG GI Wire of size 2X3 mtr. And height 1.5 mtr. as per engineer requirement by 65X65X6 mm MS Angle post of height 2 mtr. Horizontal bar 2X3 mtr and 2X2 mtr. And top angle posts by 50X50X6 mm MS angle and two part MS Grill door of size 1.2X1.4 mtr with locking arrangement i/c necessary grouting and painted AL paint over red oxide priming of approved quality as required as per Technical Specification	79	Job
131	Hiring of vehicle for survey and supervision of proposed & dismantled HT/LT line	494	Days
132	Cutting, clearing & disposal of jungle/tree of any girth from 3(three) meter either side of HT/LT line of providing required vertical and horizontal clearance as per provision of L.E. Rule.	45	Km
133	Numbering of Fole/DT will black lepper paint after applying priming coats lry rail onde primer followed by a painting 2 or more conta with synthetic enamel paint (Yellow Colour) of spproved quality		

Sl. No.	Description of Items	Quantity	Unit
	within a area of 6"X14" on pale DT su reqd as per direction of the Engineer-in-Chargs		
a	500 KVA 3-phase 11/0.433 KV Distribution Transformer	1	Nos
b	200 KVA 3-phase 11/0.433 KV Distribution Transformer	1	Nos
c	100 KVA 3-phase 11/0.433 KV Distribution Transformer	50	Nos
d	63 KVA 3-phase 11/0.453 KV Distribution Transformer	10	Nos
e	25 KVA 3-phase 11/0.433 KV Distribution Transformer	5	Nos
f	16 KVA, 1-phase, Distribution Transformer	0	Nos
g	HT/LT Composite pole	923	Nos
(B)	CIVIL WORKS (Construction of 1(one) no. of transformer base)		
	Providing 2(Two) nos. of distribution transformer RCC base as per approved standard drawing and design		
1	Earth work in excavation in foundation trenches or drains not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m. including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m By manual means	21.14	Cum
2	Filling available excavated earth (excluding rock) in trenches plinth, sides of foundations etc. in layers not exceeding 20 2 cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50m and lift upto 1.5m All kinds of soil	14.09	Cum
3	Supplying and filling in plinth, under floor, foundations etc. with sand (fine) from quarry with all ifts including 3 spreading in horizontal layers, watering grading to required slope, ramming consolidating and compacting each layer by using plate compactor or by any suitable method complete	2.592	Cum
4	Providing and layaing in position cement concrete of specified grade excluding the cost of centering and 4 shuttering- All work upto plinth level: 1:4:8 (1 cement: 4 fine sand: 8 graded well burnt brick aggregate 20 mm nominal size	1.728	Cum
5	providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering finishing and reinforcement. All work upto plinth level a) 1:2:4 (1 cement: 2 fine sand: 4 graded well burnt brick aggregate 20 mm nominal size)	4.676	Cum
6	Reinforced cement concrete work in walls (any thickness), Including attached pilasters, buttresses, plinth and skirting courses, fillets, columns, pillars, piers, abutments, posts and struts etc. upto floor five level excluding cost of centring, 6 shuttering, finishing and reinforcement. In plinth and skirting courses, fillets, column, pillars, posts and struts a) 1:2:4 (1 cement: 2 fine sand:4 graded well burnt brick aggregate 20 mm nominal size)	1.852	Cum

Sl. No.	Description of Items	Quantity	Unit
7	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15 landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding cost of centring, shuttering, finishing and reinforcement. RCC work in suspended floors, roofs having slope upto 15* landings, balconies, shelves and chajjas a) 1:1 : 3 (1 cement: 1% fine sand: 3 graded stone aggregate 20 mm nominal size)	3.374	Cum
8	RCC work in beams, lintels, bands plain window sills, staircases and spiral staircases excluding precast spiral 8 staircase a) 1:2:4 (1 cement: 2 fine sand 4 graded well burnt brick aggregate 20 mm nominal size	4.238	Cum
9	Centering shuttering Including struttings, propping etc. and removal of form work for:		
	a) Foundations, footing bases for columns etc. for mass concrete with timber plank	17.5	Sqm
	b) Suspending floors, roofs landings balconies and access platform with timber planks	26.7	Sqm
	c) Lintels, beams girders, bressumers and cantilevers with wooden plank	29.92	Sqm
	d) Columns, plers, Abutments, posts struts with wooden plank	26.64	Sqm
10	Reinforcement for RCC work Including straightening, cutting bending, placing in position and binding all complets upto floor five level. Thermo- Mechanicily Treated bars/cold twisted deformed steel bars	1300	kg
11	First calss brick work in foundation and plinth including cost of all materials as required complete:- In cement morter 1:6 (1 cement; fine sand)	1.326	Cum
12	Providing structural Steel work in single section fred with or without connecting plate Including cutting, hoisting fixing in position and applying a priming cout of approved steel primer all complete as required:-	139.2	kg
13	12mm cement plaster in single layer including cost of materials required and finishing even and smooth and curing complete a) In cement mortor 1:4 (1 cement: 4 fine sand)	36	Sqm
14	Welding by gas or electric plant including transportation of plant at site etc. complete as per standard design	2000	cm
15	6mm cement plaster in single layer including cost of materials required and finishing even and smooth and curing complete a) in cement mortor 1:3 (1cement:3 fine sand)	25.66	Sqm
16	Neat cement punning	32	Sqm
17	Providing and fixing 15: 1341 marked MS heavy weight butt hinges with necessary screws etc. Complete: 100x75x3.50mm	24	Nos
18	Providing and fixing ISI marked oddised MS sliding door bolts with nuts and screws etc. Complete: 250x16mm	4	Nos
19	Providing and fixing with hard drawn steul wira frbric 75x25mm mesh of weight not less then 7.75kg per som et welded with steel frames complete et per classes of cheatse 12 of CPWD specification	24.36	Sqm
20	Applying priming coat with ready mixed red oxide sinc 20 chromate primer of approved brand and manufacture on steel, galvanised iron/steel work	30.42	Sqm
21	Painting with synthetic enamel paint two or more coats) of required colour of approved brand and manufacture on new 21 work to give an even shade over an under coat of suitable 30.42 shade with ordinary paint of approved brand manufacture	30.42	Sqm

Sl. No.	Description of Items	Quantity	Unit
C	**Dismantling of the following items**		
1	1 11 KV Class, 3-ph Arial Bunched Cabile of size 3CX120+1X100 sgmm for 11 KV Overhead line	1400	Mtr
	11 KV Class, 3-ph Arial Bunched Cable of sire 30x95+10+16+170 sqmm	2000	Set
2	Suspension Assembly comprising of 'suspension bracket, move bleconnecting link, galvanised suspension clamp, bracket clamp suitable for 70-120 sqmm bare massenger wire. (For HT AB Cable)	43	Set
3	Dead End/Anchoring Assembly comprising of 'tension bracket', wedge type tension clamp, flexible stainless steel rope for fixing of tension clamp to bracket suitable for 70- 120sqmm bare massenger wire.	29	km
4	Laying, hoisting & stringing of LT AB Cable (3x70 +1x50+1x16 sq. mm) including binding, jumpering, etc. as required & as per direction of the Engineer-in-Charge.	4	No
5	Suspension clamp Assembly with straps & Buckle (25-35 mm)	84	No
6	Dead end clamp Assembly with straps & Buckle (25-35 mm)	36	No
7	Service anchore clamp	60	No
8	Distribution Box three phase (25-35 mm)	36	No
9	Eye Hook (25 mm)	60	No
10	Pole clamp (25/50 mm)	60	No
11	LT Insulation Piercing Connectors (IPC) for making Tee/Tap-off/Service connectors to an ABC/Bare Overhead Line suitable for 25sqmm to 95sqmm.	120	Nos
12	Dismantle of 4-Wire LT bracket in/c clamp, nut & bolts etc.	72	Nos
13	Dismantle of 3-Wire LT bracket in/c clamp, nut & bolts etc.	99	Nos
14	Dismantle of 2-Wire LT bracket in/c clamp, nut & bolts etc.	98	Nos
15	Erection of 5-Wire LT C-bracket i/c clamp, nut & bolts etc. by 65X65X6 mm Galvanized Angle	27	Nos
16	Erection of 3-Wire LT C-bracket /c clamp, nut & bolts etc. by 65X65X6 mm Galvanized Angle	64	Nos
17	Dismantle of 11KV S.P. Top Cross arm in/c clamp,nut & bolts etc.	181	Nos
18	Dismantle of 11KV S.P Bottom Cross arm in/c clamp, nut & bolts etc.	192	Nos
19	Dismantle of 11 KV S.P. Guard Cross arm in/c clamp, nut & bolts etc.	142	Nos
20	clamp, nut & bolts etc. Dismantle of 11KV D.P. Bottom Cross arm in/c clamp, nut & bolts etc.	91	Nos
21	Dismantle of 11 KV D.P. Guard Cross arm in/c clamp, nut & bolts etc.	91	Nos
22	Dismantle of Stay Set complete (HT/LT) in/c earth excavation.in/c clamp, nut & bolts etc.	155	Nos
23	Dismantle of 2.8 mtr long100x50x50x6 mm channel of sub-station cross arm in/c clamp, nut & bolts etc.	91	Nos
24	Dismantle of 2.8 mtr 75x40x40x6 mm channel 24 of sub-station cross arm in/c clamp, nut & bolts etc.	133	Nos
25	Dismantle of 2.8 mtr long 65x65x6 mm MS angle of sub-station cross arm in/c clamp, nut & bolts etc.	77	Nos
26	Dismantle of 0.6 to 0.8 mtr long MS angle 26/channel of sub-station cross arm in/c clamp, nut &bolts etc.	93	Nos
	Dismantle of 3.2 mtr long 65x65x6 mm MS angle /channel of sub-station cross arm in/c clamp, nut &bolts etc.	7	Nos
27	Dismantle of 500 KVA Transformer from base(Pole mounted/RCC	1	Nos

Sl. No.	Description of Items	Quantity	Unit
	base)		
28	Dismantle of 100 KVA Transformer from base(Pole mounted / RCC base)	9	Nos
29	Dismantle of 63 KVA Transformer from base (Pole mounted/RCC base)	8	Nos
30	Dismantle of 25 KVA Transformer from base (Pole mounted/RCC base)	7	Nos
	Dismantle of 16 KVA Transformer from base (Pole mounted/RCC base)	1	Nos
31	Dismantle of 9.0 mtr. long PCC Pole in/c earth excavation.	181	Nos
32	Dismantle of 8.0 mtr. long PCC Pole in/c earth excavation.	135	Nos
33	Dismantle of 11 mtr. long Steel Tubular Pole In/c earth excavation.	160	Nos
34	Dismantle of 8.0 mtr. long Steel Tubular Pole in/c earth excavation.	119	Nos
35	Dismantle of 9.0 mtr. long Steel Tubular Pole In/cearth excavation.	108	Nos
36	Dismantle of 11KV Disc. Insulator with fittings	341	Nos
37	Dismantle of 11 XV Pin Insulator with G.1 Pin.	418	Nos
38	Dismantle of LT Shackle insulator	716	Nos
39	Dismantle of ACSR (6/1/2.59) l/c opening of binding, jumpering, and coiling etc as reqd. as per diredtion of the Eng. In Charge.	99	km
	Dismantle of ACSR (6/7/4.72/1.57 mm dia DOG) /c opening of binding, jumpering, and colling etc as reqd. as per direction of the Eng. In Charge.	0.5	km
40	Dismantle of G.I. Guard Wire in/ci/claying hoisting, binding opening of jumpering, as per direction of the Eng. In Charge.	36	km
41	Dismantle of Triple pole (3ph, 12 KV), 200 Amps manually gang operated air break switch (A.B.Switch.) including necessary connection.	42	Nos
42	Dismantaling of spacer of conductor of single/two/three phase LT line with the help of spacer and For 4/5 wire LT line	140	Nos
43	Dismantle of cross lacing/for providing cradle/cage guarding for HT/LT Line by G.I. (SWG) wire as per Technical specification	460	Nos
44	Dismantle of Triple pole (3 ph, 12 KV)200 Amp drop out fuse unit (D.O. Fuse Unit) suitable for operation for 11 KV, 50 Hz AC system Including necessary connection.	42	Nos
45	Dismantle of 9 KV, 5 KA single pole metal Oxide gapless surze type LA suitable for nominal system voltage of 11 KV including necessary connection as per Technical specification.	124	Nos
46	Dismantling & Re-fixing of i-phase Service Connection	1110	Nos
47	Dismantling & Re-fixing of 3-phase Service Connection	91	Nos
d	**EHT tower shifting**		
1	66 kv Tower	01	Nos
2	132 kv tower	04	Nos
e	**DWS Utility Shifting**		
Item No.	**Description of Items**	**Quantity**	**Unit**
1	Drilling and boring pilot hole in any soil strata by drilling rig, collection of soil samples of diffetent strata met with during drilling at verious suitable levels, preservation of samples in polythene bags/ sample boxes and disposal of excess soil or mud including the cost for bentonite water etc. as required to maintain the pilot hole properly as per specification (IS : 2800(part-I)) and direction of the Engineer-in-charge.		
	A. With contractor's high power rig		

Sl. No.	Description of Items	Quantity	Unit
	1. Upto 250.00 mtr		
	i. 320 mm dia	500	mtr
	II. Beyond 250.00 mtr. and upto 375.00 mtr		
	i. 320 mm dia	231.7	mtr
2	Reaming of pilot hole to an enlarged bore hole in any soil strata by deep drilling rig, disposal of excess soil or mud, including the cost for bentonite water etc. as required to maintain the bore hole properly as per specification (IS : 2800(part-I) and direction of the Engineer-in-charge		
	A. With contractor's high power rig		
	I. Upto 250.00 mtr		
	i. from 320 mm dia pilot hole to 550 mm bore hole	80	mtr
	ii. from 320 mm dia pilot hole to 460 mm bore hole	420	mtr
	II. Beyond 250.00 mtr. and upto 375.00 mtr		
	i. from 320 mm dia pilot hole to 460 mm bore hole	140.24	mtr
3	Washing of enlarged bore hole of 460-550 mm dia in any soil strata by deep drilling rig, disposal of excess soil or mud, including the cost for bentonite, water etc. as required to maintain the bore hole properly including lifting of drill pipes as per specification (IS : 2800 (part-1)) and direction of the Engineer-in-charge		
	A. with contractor's high power rig	640.24	mtr
4	Providing and lowering of ERW pipe conforming to IS:3589- 2001 (with latest revision) with drilling rig including painting with anti-corrosive bitumastic paints, fixing of M.S. ring, welding of all joints etc. complete after washing of the bore hole as per specification (IS : 2800 (part-I)) and direction of the Engineer-in-Charge		
	A. With contractor's high power rig		
	I. 300 mm dia ERW housing pipes	73.16	mtr
	ii) 200 mm dia ERW blind pipes	463.4	mtr
	iii. 200 mm dia ERW slotted pipes	73.16	mtr
5	Providing and fixing of bail plug (made with 8 mm thick MS sheet) by welding with blind pipe including applying of anti-corrusive bitumastic paint as per specification (IS : 2800 (part-I)) and direction of the Engineer-in-charge.		
	i. for 200 mm dia ERW pipes	2	Nos
6	Providing and fixing of reducing socket (made with 8 mm '-.hick MS sheet) by welding with blind pipe including applying of anti-corrusive bitumastic paint as per specification (IS : 2800 (part-I)) and direction of the Engineer-in- charge.		
	A. With contractor's high power rig	2	Nos
	i. 300 X 200 mm dia		
7	Providing and shrouding of the deep tube well assembly with washed Pea-gravels (2.0 - 4.75 mm effective size) as per specification (IS:4097) and direction of the Engineer-in-Charge.		
	A. With contractor's high power rig		
	i. with pea gravels obtained from Durgapur, West Bengal	90.08	Cum

Sl. No.	Description of Items	Quantity	Unit
8	Providing and fixing of housing clamp(made with 12 mm thick MS sheet) by welding with blind pipe including applying of anti-corrusive bitumastic paint as per specification (15:2800(Part-I)) and direction of the Engineer-in-charge		
	i. 300 mm dia	2	Nos
9	Washing and development of tube well by using air compressor and testing of the well as per specification(IS:11189) & direction of the Engineer-in-Charge.		
	II. Beyond 200 mtr pipe assembly		
	A. With contractor's air compressor		
	i) using air compressor of 1100 cfm output	2	Nos
10	Providing and fixing of Well Cap (made with 8 mm thick MS sheet) by welding with blind pipe including applying of anticorrusive bitumastic paint as per specification (IS:2800(PartI)) and direction of the Engineer-in- charge.		
	i. for 300 mm dia ERW pipes	2	Nos
11	Charges for electro-logging for ground water exploration related to portable dringking water purpose borewell (200-550 mm dia) using a microprocessor based digital multiprobe borwell logger and submission of acquired data in the shape of numerical as well as graphical and determination of lithologgy and static graphic co-relation of acquifer, effective porosity and permeability, location of water bearing and saturated water zone and its coresponding discharge and also guidance for setting up of taping zone etc complete as per direction of the Engg-in-charge (All necessary equipments relating to electro-logging should have to be arranged by the agency)		
	I. BGL upto 250.00 mtr.	500	mtr
	ii. BGL beyond 250.00 mtr and upto 457.00 mtr	231.7	mtr
12	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.-All kinds of soil i) By manual means	118.87	Cum
13	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m. -All kinds of soil	82.58	Cum
14	Supplying and filling in plinth, under floor,foundations etc. with sand (fine) from local quarry with all lifts including spreading in horizontal layers, watering, grading to required slope, ramming, consolidating and compacting each layer by using plate compactor or by any suitable method complete.	11.78	Cum
15	Providing and laying in position cementconcrete of specified grade excluding the cost of centring and shuttering		

Sl. No.	Description of Items	Quantity	Unit
	i) 1:2:4 (1 cement : 2 fine sand : 4 well burnt brick aggregate 40 mm nominal size)	0.42	Cum
16	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - All work upto plinth level: 1:3:6 (1 Cement: 3 fine sand : 6 graded well burnt brick aggregate 40 mm nominal size)	5.91	Cum
17	iii) 1:4:8 (1cement : 4 fine sand : 8 graded well burnt brick aggregate of 40 mm nominal size)	1.16	Cum
18	i)Foundations, footings, bases for columns	15	sqm
	ii) Columns, Piers, abutments, pillaras, posts and struts	6.5	sqm
19	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - - All work upto plinth level: 1:5:10 (1 Cement: 5 fine sand : 10 graded well burnt brick aggregate 40mm nominal size)	0.79	Cum
20	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement- a) All work upto plinth level: 1 : 2 : 4 (1 cement : 2 fine sand : 4 graded well burnt brick aggregate of 20 mm nominal size)	3.45	Cum
21	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and skirting courses, fillets, columns, pillars, piers, abutments, posts and struts etc. upto floor five level excluding cost of centring, shuttering, finishing and reinforcement- In plinth and skirting courses, fillets, columns, pillars, posts and struts. (i) 1:2:4 (1 Cement: 2 fine sand : 4 graded well burnt brick aggregate 20 mm nominal size)	3.58	Cum
22	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding the cost of centring, shuttering, finishing and reinforcement- i) 1:2:4 (1 Cement: 2 fine sand : 4 graded well burnt brick aggregate 20 mm nominal size)	1.03	Cum
23	Centering shuttering including struttings, propping etc. and removal of form work for: a)Foundations, footings, bases for columns etc for mass concrete with timber plank	12.16	sqm
24	b) Lintels, beams, plinth beams, girders, bressumers and cantilevers with wooden plank	21	sqm
25	c) Weather shade chajjas, corbels etc including edges	12.74	sqm
26	b) Columns, Pillars, Piers, Abutments, Posts and Struts with wooden plank.	30.78	sqm
27	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. a) Thermo-Mechanically Treated bars of Grade	510	kg

Sl. No.	Description of Items	Quantity	Unit
28	Reinforcement for R.C.C. work including straightening, cutting, bending, placing inposition and binding all complete above plinth levela) Thermo-Mechanically Treated bars of Grade FE-500D or more	350	kg
29	First class brick work in foundation and plinth including cost of all materials as required complete:- a) In Cement mortar 1:6 (1 cement : 6 fine sand)	7.5	Cum
30	First class brick work in foundation and plinth including cost of all materials as required complete:- a) In Cement mortar 1:6 (1 cement : 6 fine sand)	8	Cum
31	First class brick work in superstructure above plinth level & upto floor-five level including cost of all materials as required complete:- e:- iii) In Cement mortar 1:4 (1 cement : 4 fine sand)	3.53	Cum
32	Extra for brick work in triangular, square and rectangular pillars including cost of all materials as required complete	3.53	Cum
33	Half brick masonry work with first class bricks in superstructure upto floor five level including cost of all materials as required complete:- a) In Cement mortar 1:4 (1 cement : 4 fine sand)	83.68	sqm
34	Half brick masonry work with first class bricks in foundation and plinth including cost of all materials as required complete:- a) In cement mortar 1:4 (1 cement : 4 fine sand)	0.52	sqm
35	Half brick masonry work with first class bricks in foundation and plinth including cost of all materials as required complete:- a) In cement mortar 1:5 (1 cement : 5 fine sand)	8.3	sqm
36	Providing and laying cement concrete 1:2:4 (1 cement: 2 fine sand : 4 graded well burnt brick aggregate) flooring finished with a floating coat of neat cement including cement slurry, rounding of edges and cost of glass strips etc. complete. a) 40 mm thick	19.15	sqm
37	Providing and laying cement concrete 1:2:4 (1 cement: 2 fine sand : 4 graded well burnt brick aggregate) flooring finished with a floating coat of neat cement in/c cement slurry, rounding of 16.00 edges and strips etc. complete. a) 40 mm thick with 20 mm well burnt brick aggregate	16	sqm
38	12mm cement plaster of mix. a) In cement mortar 1 : 4 (1 cement : 4 fine sand)	111	sqm
39	15 mm cement plaster on the rough side of single or half brick wall of mix. a) In cement mortar 1 : 4 (1 cement : 4 fine sand)	108	sqm
40	6 mm cement plaster of mix. a) In cement mortar 1 : 3 (1 cement : 3 fine sand)	18	sqm
41	6 mm cement plaster of mix. mortar 1 : 4 (1 cement : 4 fine sand)	20	sqm

Sl. No.	Description of Items	Quantity	Unit
42	Neat cement punning	50	sqm
43	Providing and fixing M.S grill of requiredpattern in frames of windows etc. with M.S flat, square or round bars etc all complete.Fixet to steel windows by welding	75	kg
44	Distempering with dry distemper of approved brand and manufacture (two or more coats) of required shade on new work, over and including water thinnable priming coat to give an even shade. [Payment shall be made after submission of Test Certificate issued by the Manufacturer]	99	sqm
45	Finishing wallls with water proofing cement paint of required shade of a approved brand and manufacture [Payment shall be made after submission of Test Certificate issued by the Manufacturer]: New work (two or more coats applied @3.84 kg/10 sqm)	60	sqm
46	Finishing walls with acrylic smooth exterior paint of required shade of approved brand and manufacture [Payment shall be made after submission of Test Certificate issued by the Manufacturer] New work (2 or more coats applied @1.67 Its/10sqm over and including priming coat of exterior primer applied @ 2.20 ke/10 sqm	65	sqm
47	Painting on G.S. sheet with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade [Payment shall be made after submission of Test Certificate issued by the Manufacturer): 12.49.1 New work (two or more coats) including a coat of appropriate steel primer but excluding a coat of mordant solution	60	sqm
48	painting with synthetic enamel paint of approved brand and manufacturer of required colour to give an even shade [Payment shall be made after submission of Test Certificate issued by the Manufacturer] Two or more coats on new works over and under coat of suitable shade with ordinary paint (primer) of approved brand and manufacturer.	15	sqm
49	Providing and placing of G.I. pipe over the pump house on top portion of the R.C.C. column as per specification and the direction of the Engineer- in-charge. i) 150 mm dia.	12.2	mtr
50	Providing and fixing ISI marked oxidise M.S. tower bolts, black finish (Barrel type) with necessary screws etc. complete: i) 250x 10 mm.	2	No
51	Providing and fixing M.S. grill of required pattern in frames of window etc. with M.S. flats, square or round bars etc.all complete. i) fixed to steel windows by welding	81	kg
52	i) 150 x 10 mm	2	Nos
53	Providing and fixing ISI marked oxidised M.S. handles conforming to IS:4992 with necessary screws etc. complete : i) 125mm	2	Nos

Sl. No.	Description of Items	Quantity	Unit
54	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steelprimer, including welding and bolted with special shaped washers etc. complete.Hot finished welded type tubes	320	Kg
55	Providing and fixing, M.S. round holding down bolts withnuts and washer plates complete as per standard design.	150	kg
56	Providing structural steel work in single section fixed with or without connecting plate in/c cutting , hoisting, fixing, in position and applying a priming coat of approved steel primer all complete as required.	20	kg
57	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6mm angle iron and 3mm M.S. gusset plates at the junctions and corners, & with cleats with bolts & nuts, rivets, locking arrangement, handles, hooks & eyes, pinlets including embedding in cement concrete of required grade for fixing in position, all necessary fittings, including applying a priming coat of approved steel primer etc. complete as required:- a)Using flats 30x6mm for diagonal braces and central cross Piece.	13.68	sqm
58	Providing and fixing M.S. bolts in/c nuts & washer complete as per standard design. (i) upto 300 mm length .	14	kg
59	Providing corrugated G.S. sheet roofing including vertical/curved surface fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in horizontal/ vertical or curved surfaces) excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required. (i) 0.63mm thick with zinc coating not less than 275gm/m2	56.5	sqm
60	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement:3 fine sand: 6 graded well burnt brick aggregate 20mm nominal size) over 75mm bed of dry brick ballast 40mm nominal size well rammed and consolidated and grouted with sand including finishing the top smooth.	23	sqm
61	Providing earthing with perforated 40 mm dia G.I. pipe (Medium class) (12 mm dia perforation) , 2.50 mtr. Long , laying of 4 mm dia GI wire from earth electrode to panel, including excavating hole of 600 mm dia and refilling with Salt and Charcoal / coke in alternate layers of 300 mm , as per standard specification and direction of the Engineer-in¬charge. (ii) For 3 phase connection with 4.00 m long GI pipe	1	No
62	Providing and fitting fixing of Fully Automatic Star Delta type Motor starter (3 ph. 50 Hz, 415V, in Steel Sheet Enclosures with Contractors and Timer etc. complete suitable for submersible Pump (L & T) as per specification and direction of the Engineer-in¬charge. i] 25 HP/18.5 kw Relay range within 20-32 +10%	1	Nos

Sl. No.	Description of Items	Quantity	Unit
	ii] 35 HP/26 kw Relay range within 20-32 +10%	2	Nos
63	Providing and fitting fixing of 6 feet x 4 feet x 1 inch inch (thickness) Gamair wood / plywood pannel board for fitting fixing of electrical items, in/c 2 nos MS angle post (size 2 inch x 2 inch x 9 feet), nuts & bolts etc. for irrection of the same by 1:1.5:3 cement concrete casting (1 feet x 1 feet x 2 feet) below the ground level and painting two or more coats & plastic paint as per specification and direction of the Engineer-in-charge.	2	No
64	Providing and fitting fixing steel sheet enclosed switch fuse unit (suitable for DIN fuses), triple pole with Neutral Link (TPN), 415/500 Volt, L & T / Havells / BCH make etc. complete as per specification and direction of the Engineer-in-charge. (i) 63 amps	1	Nos
	(ii) 100 amps	2	Nos
65	Providing and fitting fixing with PVC insulated single core multi strand Copper cable conforming to IS : 694 for inter connection with all electrical equipments of the pannel board as per specification and direction of the Engineer-in-charge. i) (i) 10 sqmm	11.79	mtr
	(ii) 16 sqmm	23.21	mtr
66	Providing and fitting fixing of moving iron type,Range 0-500 V, 96 mm x 96 mm size AC Volt meter (L & T / AE make) with selector switch as a electrical instrument of the pannel board as per specification and direction of the Engineer-in-charge.	2	No
67	Providing and fitting fixing of moving iron type, Range 0-100/0-200 amps, 96 mm x 96 mm size AC Amps meter direct reading type (L & T / AE make) with selector switch and CT coil as a electrical instrument of the pannel board as per specification and direction of the Engineer-in¬charge.	2	No
68	Providing and febrication of column pipe including fitting fixing of G.I Flange by cutting the G.I pipe(conforming to LS:1239 medium class) into 3.05 mtr long and welding the same direction of Engineer-in -Charge (G.I. pipe will be provided by the agency at his own cost & risk). iv)For 100 mm dia G.I. pipe with 10 mm thick GI flange	10	No
69	Providing and fitting fixing of Moulded Case Circuit Breaker (MCCB) of different Thermal release range , 415 + V, 50Hz (L & T, BCH, ABB make)as per specification and direction of the Engineer-in¬charge.	1	No
70	Providing and fitting fixing of Moulded Case Circuit Breaker (MCCB) of different Thermal release range , 415 + V, 50Hz (L & T, BCH, ABB make)as per specification and direction of the Engineer-in¬charge. I0 32-40 Amps	1	Nos
71	(Providing and fitting fixing heavy duty box type (Resin filled) power factor correction capacitor (L & T) make etc. complete as per specification and direction of the Engineer-in¬charge. i) 5-15 kVAr 440	17.86	kVAr

Sl. No.	Description of Items	Quantity	Unit
72	Providing and fitting fixing 3 phase indicating lamp fiited with panel board with three different colour lamps with batten holder complete as per specification and direction of the Engineer-in¬charge.	2	No
73	Providing earthing with perforated 40 mm dia G.I. pipe (Medium class) (12 mm dia perforation), laying of 4 mm dia Gl wire from earth electrode to panel, including excavating hole of 600 mm dia and refilling with Salt and Charcoal / coke in alternate layers of 300 mm, as per standard specification and direction of the Engineer-in-charge.i) For 3-phase connection with 4.00 mtr. Long G.I. pipe	1	Nos
74	Providing and fitting fixing Single phasing preventor selectable under voltage selectable over voltage on delay 5 sec & off delay 15 sec phase asymmetry 10% L &T/BCH/HAVELS/Siemens etc. make complete as per specification and direction of the Engineer-in-charge.	1	Nos
75	Providing and fitting fixing with PVC insulated 3 core flat Copper cable conforming to relevant IS code for submerssible motor with all necessary equipments and fittings as required as per sepcification ans direction of the Engineer-in-charge (iii)6.0 sqmm	30	mtr
76	Providing, fitting fixing and installation GPH x 76 mtrs. Head water lubricated submersible pump of maximum 150 mm outer dia. With maximun 10 (Ten) stages coupled with required water and non-cover loading submersible motor suitable for 340¬440 volts, 3 phase 50Hz, AC supply and star delta method of starting along with 35 mtrs. x 2 x 3 x 4 sq.mm joint less PVC 3 (three) core double length flat cable (continuous length) of suitable size fitted with submersible motor, suction case, strainer, coupling key, vertical non-return valve cum discharge case including supplying of 10 Nos. suitable cable guard with clips and nuts & bolts, 2 (two) pair M.S. column clamps as per direction of Engineer-in-charge conforming to terms & conditions of the contract (Each pump with motor shall consists of stainless stell closed type impeller, C.I. bowl, C.l discharge case, pump shaft (styainless steel), bush (bronze), shaft sleeve (bronze/ chromium), sand guard, winding rotor, stator, counter thrust plate, thrust plate, thrust bearing segment etc. conforming to relevant BIS codes of made DUKE/KSB/WPIL/CRI).	1	Set
77	Providing fixing and laying rigid UPVC pipes conforming to IS: 4985 jointing with couplers, of same class conforming to IS: 10124 (Pt-II) with solvent cement conforming to IS: 14182 including testing of joints complete (but excluding the cost of specials like bend, tees etc. which will be pald separately) as per CPWD specification and direction of the Engineer-In-charge.		
	i) 63 mm OD	778.5	mtr
	ii) 90mm OD	1964.25	mtr
	iii)110mm OD	1185.5	mtr
	iv) 140mm OD	964.25	mtr

Sl. No.	Description of Items	Quantity	Unit
78	roviding, fixing and laying fabricated UPVC bend of required degree conforming to IS: 10124 (part8/9/ 10/11/12/13) with solvent cement conforming to IS: 14182 Including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge.		
	i) 63 mm OD	3	Nos
	ii) 90mm OD	9	Nos
	iii)110mm OD	6	Nos
	iv) 140mm OD	4	Nos
79	Providing, fixing and laying fabricated UPVC end cap conforming to IS: 10124 (Part 4) with solvent cement conforming to IS: 14182 including testing of joints complete as per CPWD specification and direction of the Engineer-In-charge.		
	i) 63 mm OD	2	Nos
	ii) 90mm dia	5	Nos
	iii)110mm dia	1	Nos
80	Providing, fixing and laying fabricated UPVC equal tee conforming to IS: 10124 (Part 5) with solvent cement conforming to IS: 14182 including testing of joints complete as per CPWD specification and direction of the Engineer-in-charge.		
	i) 63 x 63 mm dia	2	Nos
	ii) 90 x 90 mm dia	7	Nos
	iii)110 x 110 mm dia	2	Nos
	iv) 140 x 140 mm dia	2	Nos
81	Providing, fixing and laying fabricated UPVC straight reducer conforming to IS: 10124 (Part 3) with solvent cement conforming to IS: 14182 including testing of joints complete as per CPWD specification and direction of the Engineer-in-charge.		
	i) 63 x 63 mm dia	1	Nos
	ii) 90 x 90 mm dia	1	Nos
	iii)110 x 110 mm dia	4	Nos
	iv) 140 x 140 mm dia	3	Nos
82	Providing, fixing and laying flanged fabricated UPVC tailpiecewith MS flange (8 mm thick) conforming to IS: 10124 (Part6) with solvent cement conforming to IS: 14182 Including testing of joints complete as er CPWD specification anddirection of the Engineer-In-		
	(1) 90 mm dia	1	Nos
	(iii) 110 mm dia	4	Nos
	iv) 140 mm dia	4	Nos
83	Providing and fixing G.L. pipes medim class as per IS: 1239 with latest amendment complete with G.I. fittings including trenching and refilling, cutting and making good the walls etc. complete as per CPWD specification and direction of the Engineer-in- charge.		
	i) 15 mm dia. nominal bore	150	mtr
84	Providing and fixing C.L. non-return valve of approved quality as per of CPWD specification and direction of the Engineer-in-charge.		
	1) 80 mm nominal bore	1	Nos
	ii) 100 mm nominal bore	1	Nos

Sl. No.	Description of Items	Quantity	Unit
85	Providing and fixing brass ferrule with C.L. cover conforming to IS: 2692 including boring and tapping the main as per CPWD specification and direction of the Engineer-in-charge.		
	1) 10 mm nominal bore	45	Nos
86	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) as per CPWD specification and direction of the Engineer - In - charge.		
	1) 80 mm dia. A. PN - 1.0	1	Nos
	(ii) 100 mm dia. A. PN - 1.0	2	Nos
	(III) 125 mm dia. A. PN-1.0	1	Nos
	ii) 150 mm dia. A. PN - 1.0	2	Nos
87	Providing and laying D.J. specials of class K-12 suitable for push on jointing as per IS: 9523 as per CPWD specification and direction of the Engineer - in - charge.		
	i) Upto 300 mm dia.	1	Tonne
88	Charges for push-on (Tyton) joints to centrifugually (Spun) cast iron pipes or ductile iron pipes including of testing of joints and including the cost of rubber gasket as per CPWD specification and direction of the Engineer-in-charge.		
	1) 100 mm dia	2	Nos
	ii) 150 mm dia	17	Nos
89	Providing and laying S & S Centrifugally Cast (Spun) Ductile Iron Class K-7 Pipes conforming to IS: 8329 as per CPWD specification and direction of the Engineer - In-charge.		
	(1) 100 mm dia Ductile Iron Class K-7 plpes.	12	mtr
	(ii) 150 mm dia Ductile Iron Class K-7 plpes.	95	mtr
90	Charges for cutting D.1. pipe with mechanical cutter as of per CPWD specification and direction of the Engineer in-charge.		
	i) 100 mm dia	1	Nos
	iii) 150 mm dia	16	Nos
91	Providing and fixing U.P.V.C. service saddle as per CPWD specification and direction of the Engineer-in- charge.		
	(1) 63 mm dia with 15 mm dia opening	20	Nos
	ii) 90 mm dia with 15 mm dia opening	10	Nos
	iii) 110 mm dia with 15 mm dia opening	4	Nos
	iv) 140 mm dia with 15 mm dia opening	4	Nos
92	Providing and laying of flexible PVC pipe (conforming to 15:7634) complete as per specification and direction of the Engineer-in-charge (cost of earth work and fittings will be paid separately).		
	i) 15 mm dia	900	mtr
	ii) 25 mm dia	200	mtr

Sl. No.	Description of Items	Quantity	Unit
93	Excavating trenches of required width for pipes, cables etc. including exacavation for sockets, dressing of sides where required, ramming of bottoms, depth upto 1500 mm (slope-1 in 200) including getting out the excavated soil and backfilling of soil as required after laying of pipeline, in layers not exceeding 200 mm in depth including consolidating each deposited layer by ramming, watering etc. and disposing of surplus excavated soil with all required leads as per Chapter - 2 of CPWD specification and direction of the Engineer-in-charge. A) For UPVC pipes in new work.		
	i) For pipes not exceeding 90 mm dia	3553.36	mtr
	ii) For pipes exceeding 90mm dia but not exceeding 300mm dia.	450	mtr
	B) For GI/CI/DI pipes in new work. a) All kind of Soils i) For pipes exceeding 90mm dia but not exceeding 300mm dia.	200	mtr
94	Providing and fixing G.I. Bend /elbow in the pipe line including testing of joints complete as per CPWD specification and direction of the Engineer-in-		
	(1) 15 mm dia	90	Nos
	ii) 25 mm dia	5	Nos
	iv) 80 mm dia	4	Nos
	v) 100 mm dia	2	Nos
95	Providing and fixing G.l. Reducer with the pipe line including testing of joints complete as per CPWD specification and direction of the Engineer in charge.		
	1) 100 x 80 mm dia	1	Nos
96	Providing and fixing G.I. socket as per CPWD specification and direction of the Engineer - in -		
	i) 15 mm dia	45	Nos
	ii) 25 mm dia	8	Nos
97	Providing and fixing G.L. union as per CPWD specification and direction of the Engineer-in- charge		
	i) 15 mm dia	45	Nos
	ii) 25 mm dia	7	Nos
98	Supplying & fitting fixing KSB make submersible pumpset, discharge 5000GP11, 205 mtr head with 3 . Cable, 242/13A+UMAG 150+24/21 18.5 KW 25 HP as per direction of the Engineer in Charge.		
	1) 5000 GPH Capacity pump motor with 50 mm dia. GI pipe and 10 mm thick Gl flange	1	Nos
99	Labour charge for fitting fixing and lowering 2500/5000/7500/10000/15000/20000 GPH capacity water lubricated vertical submerissible pump with motor Including column assembly upto 100 ft. by heavy duty chain pully block as per direction of the engineer-in-charge.(Pump motor set will be supplied by the department at free of cost). (Only for 2500 GPH pump motor)	2	Nos

Sl. No.	Description of Items	Quantity	Unit
100	Providing & fabrication of column pipe including fitting fixing of G.I. flange by cutting the GI pipe (conforming to IS: 1239 medium class) Into 3.05 mtr. long and welding the same with Gl flange as per specification and direction of the Engineer-incharge (G.I. pipe will be provided by the agency at his own cost & risk). i) For 50 mm dia G.1. plpe with 10 mm thick GI flange	35	Nos
101	Providing and fitting fixing of pressure meter (0.0- 14.0 Kg/ sqcm.) as per specification and as per specification and the direction of the Engineer In-	1	Nos
102	Making road crossing by horizontal boaring for smooth laying of UPVC/CI/DI/GI pipes etc. of required dia complete as per specification and the direction of the Engineer-in-charge.	80	mtr
103	Constructing masonry Chamber 90 x 90 x 100 cm, inside with 75 class designation brick work in cement mortar 1:4 (1 cement 4 fine sand) for sluice valve, with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 190 mm deep (Inside) with chained lid and RCC top slab 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement: 5 fine sand:10 graded stone aggregate 40 mm nominal size) and Inside plastering with cement mortar 1:3 (1 cement: 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design: ' (1) With Second Class bricks	4	Nos
104	Providing and fixing in position Precast RCC hydrant post of size 100 mm dia (made with reinforced cement concrete 1: 1.5: 3 (1 cement: 15 fine sand: 3 graded well burnt brick aggregate 1st class 12 mm nominal size) and steel reinforcement (TMT bars)3 nos 8 mm dia 950 mm long and 7 Nos 6 mm dla ties including plastering the surface with 6 mm thick cement mortar 1:3 (1 cement: 3 sand) finished with Ja floating coat of neat cement including providing & embedding 15 mm dia G.I. pipe (medium class as per IS: 1239) with necessary Gl fittings like 2 Nos elbow, 1 no socket, 2 nos nipple 225 mm long and fitting fixing of PVC bib cock with Gl socket complete with all earth work required including refilling etc. complete as per approved drawing (Drawing No- 06/CE/ACE/P&DU/DWS/2022-23), specification and direction of Engineer-in-charge.	45	Nos

Sl. No.	Description of Items	Quantity	Unit
105	Providing and fixing in position Precast RCC platform of size 900 mm x 900 mm x100 mm with curb of size 75 x 75 mm keping an opening of 200 mm wide for surface drain of 60 cm length of size (200 mmx150 mm) in a suitable place for draining out of grey water (made with cement concrete 1:1.5:3 (1 cement: 1.5 sand: 3 graded well burnt brick aggregate 12 mm nominal size) and steel reinforcement(TMT bars) 6 nos. 8 mm dia in both direction including plastering the exposed surface with 6 mm thick cement mortar 1:3 (1 cement:3 sand) for platform &12 mm cement plaster(1:4) (1 cement :4 sand) for surface drain finished with a floating coat of neat cement complete with all earth work required including refilling etc. complete as per approved drawing (Drawing No-06/CE/ACE/P&DU/DWS/2022-23), specification and direction of Engineer-in-charge.	45	Nos
106	Providing and fitting fixing of hoarding cum display board of IIM of size 8 ft. x 6 ft. (2.40 m x 1.80 m) with frame comprising of 40 mm dia Gl pipe (medium class) around the board, 2 nos. 25 x 25 x 4 mm sizo MS vertical stifmers with equally placed and 1 no. 25 x 25 x 4 mm size MS horizontal stiffner centrally placed and 2 mm thick MS Sheet (2.40 m x 1.80 m) with necessary welding, painting, lettering and erected vertically in such a way bottom of the board shall be placed 900mm above the Ground Level with 2 nos. 40 mm dia Gl pipe embedded in cement concrete block of 1:2:4 (1 Cement: 2 fine Sand: 4 graded well burnt brick aggregate 20 nım nominal size) of 300 mm x 300 mm & 900 mm total depth out of which 150 mm shall be projected over GL etc. complete as per specification and direction of the Engineer-in-Charge.	1	Nos
107	Drilling and boring pilot hole in any soil strata by manual means, collection of soil samples of different strata met with during drilling at various suitable levels, preservation of samples in polythene bags/sample boxes and disposal of excess soil or mud, including the cost of for bentonite, water etc, as required to maintain the pilot hole properly as per specification (IS: 2800 (part-I) and direction of the Engineer-in-charge.		
	a) 100 mm dia	100	mtr
108	Reaming of pilot hole to an enlarged bore hole in any soil strata by manual means, disposal of excess soil or mud, including the cost of bentonite, water etc, as required to maintain the bore hole properly as per specification and direction of the Engineer¬in-charge.		
	i) From 100 mm dia pilot hole to 250 mm bore hole.	100	mtr
109	Washing and development of tubewell by using hand pump or by any suitable method and testing of the well as per specification and direction of the Engineer-in-charge.	45	mtr
110	Providing & lowering of UPVC pipe as per IS: 12818 after washing of the bore hole by manual means as per specification and direction of the Engineer-in-charge. A 'CM' Casing pipe		
	i) 150 mm dia	40.00	mtr
	i) 100 mm dia	30	mtr

Sl. No.	Description of Items	Quantity	Unit
	B) 'RS' pipe,		
	i) 100 mm dia	30	mtr
11	Providing and fixing of UPVC reducer suitable for UPVC 'CM' sasing or 'CS' casing or 'RS' pipes as per specification and direction of the Engineer-in-charge. i)10 150x100 mm dia	1	nos
112	Providing and fixing of UPVC end cap suitable for UPVC 'CM' casing or 'CS' casing or 'RS' pipes as per specification and direction of the Engineer-in-charge (i)100 mm dia	1	nos
113	Providing and Shrouding of the deep tube well assembly with washed pea gravels (2.0 - 4.75 mm effective size) as per specification (IS:4097) and direction of the Engineer - in - charge. A. With Contractor"s Rig		
114	Providing and fixing of housing clam (made with 12 mm thick MS sheet) along with well cap (made with 10 mm thick MS sheet) with necessary 2023 arrangements for SBDTW as per specification and direction of the Engineer - in - charge.		
	iii) 125 mm dia	1	
115	Supplying and fitting fixing of single phase motor set 2HP, head (as per requirement), 160 to 220 V, 50hz At Various location in/c. trail run as per specification and direction of the Engineer - in - charge.	1	
116	Providing and fixing to filter and lowering to proper levels 40 mm G.I. pipe for tube well including cleaning and priming the tube well as per CPWD specification and direction of the Engineer - in - charge	36	
117	Providing and fixing C.I. non-return valve of approved quality as per of CPWD specification and direction of the Engineer - in - charge. i) 50mm dia	1	
118	Labour cost of lowering of 2HP/3HP submersible pump with motor in/c column pipe assembly & transportation charges from workshop/office to site in/c testing	1	
119	Supplying and fitting fixing of panel box of MS sheet with locking arrangement suitable for arrangement of all electrical accessories inside the box including service connection within 50.00 mtr length from I.T line with roof for rain water protection and 4 (four) Nos. stant by R.C.0 work in all respect as per direction of the Engineer-in-charge	1	
120	Supplying and fitting fixing of single phase motor starter panel unit 3.0 HP / 2.0 HP capacity comprise with 2 pole unit conductor, over load rely, capacitors, volt meter, amp meter of BCH/L&T make with necessary copper wire etc. complete as per direction of the Engineer-in-charge	1	
121	Providing and fitting fixing steel sheet enclosed switch fuse unit (suitable for DIN fuses), triple pole with Neutral Link (TPN), 415/500 Volt, L & T / Havells / BCH make etc. complete as per specification and direction of the Engineer-in-charge.32 Amps	1	

Sl. No.	Description of Items	Quantity	Unit
122	Providing and fitting fixing with PVC insulated 3 core flat Copper cable conforming to relevant IS code for submerssible motor with all ne equipments and fittings as required as per specification and direction of the Engineer-in- charge. i) 2.5 sq mm	40	mtr
123	Hiring charge for truck(medium duty) 4(four) wheeler for carrying of drinking water with treuk mounted syntex tank having 1000 (one thousand) Ltr capacity each 4(four) nos (minimum from nearest DWS deep tube well scheme in/c loading, carrying and disribution of water to the different crisis pocket under Mungiakami RD Block in/c cost of driver helper and as per instruction of the Engineer-in-Charge.		
	(i) Detension charge	180	Day
	(ii) Distance travelled	12600	KM
	(Agreement No:101/EE/DWS/KLNP/2022-23)		
124	Hiring charge for truck(medium duty) 4(four) wheeler for carrying of drinking water with treuk mounted syntex tank having 1000 (one thousand) Ltr capacity each 2(Two) nos (minimum from nearest DWS deep tube well scheme in/c loading, carrying and disribution of water to the different crisis pocket under Mungiakami RD Block in/c cost of driver helper and as per instruction of the Engineer-in-Charge.		
	(i) Detension charge	180	Day
	(ii) Distance travelled	12600	KM
	(Agreement No:101/EE/DWS/KLNP/2022-23)		
125	Energisation of electrical power Line & service Charge of DTW Scheme.	2	No.
126	Excavating trenches of required width for pipes cables etc in/c excavation for sockets and dressing of the sides where required ,ramming of bottoms, depth up to 1.5m in/c getting out excavated soil and backfilling of soil as required after laying of pipe line, layers not exceeding 20cm in depth in/c consolidating each deposited layer by ramming, watering and disposing of surplus excavated with all required leads as per chapter 2 of CPWD specifications and direction of the engineer-in-charge.		
	A. For UPVC pipes in new work		
	a. In all kinds of soil		
	i. For pipes not exceeding 90 mm dia.	9423	mtr
	ii. For pipes exceeding 90 mm dia but not exceeding 300 mm dia	2953	mtr
	B. F or G.I. / C.I. / D.I. pipes in new work		
	a. In all kinds of soil		
	ii. For pipes exceeding 90 mm dia but not exceeding 300 mm dia	3875	mtr
127	Providing & laying of flexible PVC pipe (conforming to IS:7634) complete as per specification and directio of the Engineer in chare.		
	i)15 mm dia.	1835	mtr

Sl. No.	Description of Items	Quantity	Unit
128	Providing, fixing and laying rigid UPVC pipes conforming to IS : 4985 jointing with couplers, of same class conforming to IS : 10124 (Pt-II) with solvent cement conforming to IS : 14182 including testing of joints complete (but excluding the cost of specials like bend, tees etc. which will be paid separately) as per CPWD specification and direction of the Engineer - in - charge.		
	A. Class - 3 (working pressure 6.0 kg / cm2)		
	i. 40 mm OD	887	mtr
	ii. 50 mm OD	879	mtr
	iii. 63 mm OD	895	mtr
	v. 90 mm OD	5762	mtr
	vi. 110 mm OD	1881	mtr
	vii. 140 mm OD	1072	mtr
129	providing fixing & laying fabricated UPVC socket/Coupler conforming to 1S:10124(pary-2) with solvent cement conforming to IS:14182 in/c testing of joints complete as per CPWD specification and direction of the Engineer in charge.		
	i. 90 mm dia	381	no
	ii. 110 mm dia	90	no
	iii. 140 mm dia	75	no
130	Providing and laying S & S Centrifugally Cast (Spun) Ductile Iron Class K-7 Pipes conforming to IS : 8329 as per CPWD specification and direction of the Engineer - in - charge.		
	i. 80 mm dia Ductile Iron Class K-7 pipes.	40	mtr
	ii. 100 mm dia Ductile Iron Class K-7 pipes.	40	mtr
	iii. 125 mm dia Ductile Iron Class K-7 pipes.	40	mtr
	ii. 150 mm dia Ductile Iron Class K-7 pipes.	410	mtr
131	Providing and fixing DI specials as per CPWD specification and direction of the Engineer-in-charge.		
	A. DI all socketted Bend 90 degree		
	i. 80 mm dia	15	no
	ii. 100 mm dia	15	no
	iii. 150 mm dia	15	no
	B. D.1. all socketted Bend 45 degree		
	i. 80 mm dia	15	no
	ii. 100 mm dia	15	no
	iii. 125 mm dia	15	no
	iv. 150 mm dia	15	no
	F. D.1. all socketted tee		
	i. 80 x 80 x 80 mm dia	15	no
	ii, 100 x 100 x 80 mm dia	15	no
	iii. 100 x 100 x 100 mm dia	15	no
	iii. 125 x 125 x 80 mm dia	15	no
	iv. 150 x 150 x 80 mm dia	15	no
	v. 150 x 150 x 100 mm dia	15	no
	vi. 150 150 150 mm dia	15	no
	I. D.I. Double Socketted tapper		
	i. 100 x 80 mm dia	15	no

Sl. No.	Description of Items	Quantity	Unit
	ii. 125 x 80 mm dia	15	no
	iii. 125 x 100 mm dia	15	no
	iv. 150 x 80 mm dia	15	no
	v. 150 x 125/100 mm dia	15	no
	J.D.1. Flanged Socketted tail piece		
	i. 80 mm dia	15	no
	ii. 100 mm dia	15	no
	iii. 125 mm dia	15	no
	iv. 150 mm dia	15	no
	K. D.I. Flanged Spigotted-tail piece		
	i. 80 mm dia	15	no
	ii. 100 mm dia	15	no
	iii. 125 mm dia	15	no
	iv. 150 mm dia	15	no
132	Providing and fixing U.P.V,C. service saddle as per CPWD specification and direction of the Engineer -in-charge		
	iii) 63 mm dia with 15 mm dia opening	1500	mtr
	V) 90 mm dia with 15 mm dia opening	2500	mtr
	viii) 110 mm dia with 15 mm dia opening	1500	mtr
133	Providing and fixing G.I. pipes of Heavy class as per IS 1239 with latest amendment complete with G.I. fittings including trenching and refilling, cutting and making good the walls etc. complete as per CPWD specification and direction of the Engineer - in -charge.		
	A. External work.		
	i. 15 mm dia. nominal bore	350	mtr
	v. 40 mm dia. nominal bore	280	mtr
	viii. 80 mm dia. nominal bore	3655	mtr
	ix. 100 mm dia. nominal bore	2945	mtr
	xi. 150 mm dia. nominal bore	1125	mtr
134	Providing & fitting fixing GI flanged(10mmwall thickness) by welding with GI-MS pipe and placning position as per direction of the Engineer in charge.		
	i) 150 mm dia	186	no
	iii) 100 mm dia	690	no
	iv) 80 mm dia	880	no
135	providing,fixing & laying fabricated UPVC bend of regd. degee confirming to IS : 14182 including testing of joints complete as per chapter 20 of CPWD specification & direction of Engg. In Charge.		
	i. 40 mm dia.	30	no
	ii. 50 mm dia.	30	no
	iii. 63 mm dia.	20	no
	v. 90 mm dia.	28	no
	vi. 110 mm dia.	26	no
	vii. 140 mm dia.	24	no

Sl. No.	Description of Items	Quantity	Unit
136	Providing, fixing and laying fabricated UPVC end cap conforming to IS : 10124 (Part 4) with solvent cement conforming to IS : 14182 including testing of Joints complete as per CPWD specification and direction of the Engineer - in - charge.		
	i. 40 mm dia.	25	no
	ii. 50 mm dia.	25	no
	iii. 63 mm dia	20	no
	v. 90 mm dia.	25	no
	vi. 110 mm dia.	25	no
	vii. 140 mm dia.	25	no
137	Providing, fixing and laying fabricated UPVC equal tee conforming to IS : 10124 (Part 5) with solvent cement conforming to IS : 14182 including testing of joints complete as per CPWD specification and direction of the Engineer - in -charge.		
	i. 40 x 40 mm dia.	30	no
	ii. 50 x 50 mm dia.	30	no
	iii. 63 x 63 mm dia	20	no
	v. 90 x 90 mm dia.	25	no
	vi. 110 x 110 mm dia.	25	no
	vii. 140 x 140 mm dia.	25	no
138	Providing, fixing and laying fabricated UPVC straight reducer conforming to IS : 10124 (Part 3) with solvent cement conforming to IS : 14182 including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge.		
	i. 50 x 40 mm dia	30	no
	ii. 63 x 50 mm dia	20	no
	v. 110 x 90 mm dia	30	no
	vi. 140 x 110 mm dia	25	no
	vii. 140 x 90 mm dia	25	no
139	providing,fixing & laying fabricated UPVC tail piece with MS flange(8mm thick)of reqd. degee confirming to IS 14182 including testing of joints complete as per chapter 20 of CPWD specification & direction of Engg. In Charge.		
	v. 90 mm dia.	29	no
	vi. 110 mm dia.	29	no
	vii. 140 mm dia.	29	no
140	Providing and fixing of CI non-return valve of approbed quality as per chapter clause 201 of CPWD and as per direction of Engineer in charge.		
	vi)150 mm nominal bore.	7	no
141	Providing & fitting, fixing CI sluice Valve class I (with cap) complete with nuts, bolts, rubber insertion etc. (the tail piece if required will be paid separetely)		
	iii) 80 mm dia	6	no
	iv) 100 mm dia	6	no
	v) 125 mm dia	5	no
	vi) 150 mm dia	7	no

Sl. No.	Description of Items	Quantity	Unit
142	Providing & fixing bruss ferrule with CI cover conforming tO IS:2692 in/c boaring and taping the main as per chapter 20 of CPWD specification and direction of Engineer in charge.		
	i) 10 mm nominal bore	212	no
143	Providing & fixing of GI socket as CPWD specification & direction of incharge.		
	i) 15 mm nominal bore	379	no
144	Providing & fixing of GI bend/elbow in the pipe line as per CPWD specification and direction of Engineer in charge		
	i) 15 mm dia	424	no
	vii) 80 mm dia	10	no
	ix) 100 mm dia	10	no
	xi) 150 mm dia	10	no
145	roviding & fixing of GI union joints as per CPWD specification and direction of Engineer in charge		
	i) 15mm dia	379	no
	v) 40 mm dia	30	no
	vi) 50 mm dia	30	no
146	Providing and fixing G.I. Reducer with the pipe line including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge.		
	vii. 40 x 15 mm dia	20	no
	x. 50 x 15 mm dia	20	no
	xxii. 80 x 40 mm dia	10	no
	xxviii. 100 x 80 mm dia	10	no
	xxxiv. 150 x 80 mm dia	4	no
	xxxv. 150 x 100 mm dia	7	no
147	Providing and fixing G.I. Unequal Tee with the pipe line including testing of joints complete as per CPWD specification and direction of the Engineer -in - charge		
	vii. 40 x 40 x 15 mm dia	14	no
	x. 50 x 50 x 15 mm dia	14	no
	xxii. 80 x 80 x 40 mm dia	14	no
	xxviii. 100 x 100 x 80 mm dia	14	no
	xxxii. 150 x 150 x 100 mm dia	14	no
148	Providing & fixing GI Nipple of medium class as per chapter 20 of CPWD specification and direction of Engineer in charge		
	i) 15mm dia 75mm long	212	no
	ii) 15mm dia 150mm long	25	no
149	Providing & fixing CI bib cock (long handle) as per CPWD specification and direction of the Engineer in charge		
	i) 15 mm dia	212	no
150	Making road crossing by horizontal boring for smooth laying of UPVC / CI / DI / GI pipes etc. of required dia complete as per specification and the direction of the Engineer-in-charge.		
	B. by manual means.	213	no

Sl. No.	Description of Items	Quantity	Unit
151	Providing and fixing C.I. double action air valve of approved quality with bolts, nuts, rubber insertions etc. complete as per CPWD specification and direction of the Engineer - In - charge. (The tail pieces, tapers etc if required will be paid separately).		
	i) 50 mm dia	140	no
	ii) 80 mm dia	40	no
152	constructing masonry Chamber 90 x 90 x 100 cm, inside with 75 class designation brick work in cement mortar 1:4 (1 cement: 4 fine sand) for sluice valve,with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 190 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1) cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design.		
	(I) With Second Class bricks.	8	no
153	constructing masonry Chamber 120 x 120 x 120 cm, inside with 75 class designation brick work in cement mortar 1:4 (1 cement: 4 fine sand) for sluice valve,with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 190 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1) cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design.		
	(I) With Second Class bricks.	6	no
154	Providing and fixing in position Precast RCC hydrant post of size 100 mm dia (made with reinforced cement concrete 1 : 1.5 : 3 (1 cement : 1.5 fine sand : 3 graded well burnt brick aggregate 1st class 12 mm nominal size) and steel reinforcement (TMT bars) 3 Nos. 8 mm dia 950 mm long and 7 Nos. 6 mm dia ties including plastering the surface with 6 mm thick cement mortar 1 : 3 (1 cement : 3 sand) finished with a floating coat of neat cement including providing & embedding 15 mm dia G.I. pipe (medium class as per IS 1239) with necessary GI fittings like 2 Nos. elbow, 1 No. socket 2 Nos. nipple 225 mm long and fitting fixing of PVC bib cock with Cl socket complete with all earth work required including refitting etc. complete as per approved drawing. Drawing No.06/CE/ACE/P&DU/DWS/2022-23). Specification and direction of the Engineer-in-charge.	212	no

Sl. No.	Description of Items	Quantity	Unit
155	roviding and fixing in position Precast RCC platform of size 900 mm x 900 mm x100 mm with curb of size 75 x 75 mm keping an opening of 200 mm wide for surface drain of 60 cm length of size (200 mmx150 mm) in a suitable place for draining out of grey water (made with cement concrete 1:1.5:3 (1 cement: 1.5 sand: 3 graded well burnt brick aggregate 12 mm nominal size) and steel reinforcement (TMT bars) 6 nos. 8 mm dia in both direction including plastering the exposed surface with 6 mm thick cement mortar 1:3 (1) cement :3 sand) for platform &12 mm cement plaster(1:4) (1 cement :4 sand) for surface drain finished with a floating coat of neat cement complete with all earth work required including refilling etc. complete as per approved drawing {Drawing No-06/CE/ACE/P&DU/DWS/2022-23), specification and direction of Engineer-in- charge.	212	no
156	Providing and fixing M.S. bolts in/c nuts & washer complete as per standard design. upto 300 mm length	139.5	kg
157	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI: 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	12.1	ltr
158	Providing and fixing C.I double action air valve of approved quality with nuts, bolts, rubber insertion complete etc. as per chapter 20 of CPWD specification and direction of engineer in charge (the tailpiece, tapper etc. if required will be paid separately.		
	iii) 100 mm dia.	10317.3	nos
159	Providing and fitting fixing of brass fullway valve with handle in the Gl pipe line including cutting, threading etc. complete as per CPWD specification and direction of the Engineer - in - charge.		
	v) 40 mm dia.	885.3	Nos
	vi) 50 mm dia.	1107.3	Nos
160	First class brick work in foundation and plinth including cost of all materials as required complete:		
	In cement mortar 1:4 (1 cement: 4 fine sand).	9845.2	Cum
161	Charges for making G.I. Short piece i/c. cutting threading at both end, fitting, fixing at site etc. as per specification and the direction of the Engineer-in-charge.		
	i) 125 mm dia	694.2	No
	ii) 100 mm dia	616.9	No
	iii) 80 mm dia	539.9	No
	IV) 50 mm dia	409.9	No
162	Providing and fixing U.P.V.C. service saddle as per CPWD specification and direction of the Engineer - in-charge.		
	i. 40 mm dia with 15 mm dia opening	362.7	No
	ii. 50 mm dia with 15 mm dia opening No.	384.7	No
	iii. 63 mm dia with 15 mm dia opening	406.7	No
	iv. 75 mm dia with 15 mm día opening	430.1	No
	v. 90 mm dia with 15 mm dia opening	447.7	No

Sl. No.	Description of Items	Quantity	Unit
163	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. a) All Kinds of Soil	18.874	Cum
164	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m. A)All kinds of soil	12.583	Cum
165	Supplying and filling in plinth, under floor, foundations etc. with sand (fine) from local quarry with all lifts including spreading in horizontal layers, watering, grading to required slope, ramming, consolidating and compacting each layer by using plate compactor or by any suitable method complete	6.766	Cum
166	Providing and laying in position cement concrete of specified grade excluding the costof centering and shuttering.a) All work upto plinth livel0 1:2:4 I.Cement: 2 fine sand : 4 well burnt brick aggregate 40 mm nominal size)	0.422	Cum
167	ii) 1 : 3 : 6 (1 cement : 3 fine sand : 6 graded well burnt brick aggregate of 40 mm nominal size)	3.241	Cum
168	iii) 1 : 4 : 8 (1 cement 4 fine sand : 8 graded well burnt brick aggregate of 40 mm nominal size)	1.158	Cum
169	Centering shuttering including struttings, Proppingetc. and removal of form work for: I) Foundations, footings, bases for columns	15.000	Sqm
170	ii) Columns, piers, abutments, pillaras, posts and struts	6.500	Sqm
171	the cost of centring, shuttering, and reinforcement- All work upto level: i) 1:2:4 (1 cement: 2 fine :4 graded well burnt brick aggregrate 20mm nominal size	1.833	Cum
172	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and skirting courses, fillets, columns, pillars, piers, abutments, posts and struts etc. upto floor five level excluding cost of centring, shuttering, finishing and reinforcement- i) 1:2:4 (1 Cement: 2 fine sand : 4 graded well burnt brick aggregate 20 mm nominal	1.080	Cum

Sl. No.	Description of Items	Quantity	Unit
173	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding the cost of centring, shuttering, finishing and reinforcement- i) 1:2:4 (1 Cement: 2 fine sand : 4 graded well burnt brick aggregate 20 mm nominal size	0.571	Cum
174	Centering shuttering including struttings, - propping etc. and removal of form work for: i) Foundations, footings, bases for columns etc. for mass concrete with timber plank	10.000	Sqm
175	i) Lintels, beams, plinth beams, girders, bressumers and cantilevers with wooden playk	12.000	Sqm
176	ii) Columns, Pillars, Piers, Abutments, Posts a Struts with wooden plank	15.000	Sqm
177	iv) Weather shade, Chajjas, corbels etc., including edges.	10.000	Sqm
178	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth Level level i) Thermo-Mechanically Treated bars of }gradeFe-500D or more	260.000	Kg
179	Reinforcement for R.C.C. work includingstraightening, cutting, bending, placing in position and binding all complete above Plinthleveli) Thermo-Mechanically Treated bars of nradeFe-500D or more	200.000	Kg
180	First class brick work in foundation and plinth including cost of all materials as required complete: i) In cement mortar 1:4 (1 cement : 4 fine sand)	6.110	Cum
181	First class brick work in superstructure above plinth level & upto floor-five level including cost of all materials as required complete:- i) In Cement mortar 1:4 (1 cement : 4 fine sand)	1.953	Cum
182	Extra for brick work in triangular, square and rectangular pillars Including cost of all materials as required complete	1.953	Cum
183	Half brick masonry work with first class bricks in foundation and plinth including cost of all materials as required complete:- i) In Cement mortar 1:4 (1 cement : 4 fine sand)	0.520	Sqm
184	Half brick masonry work with first class bricks in superstructure upto floor five level including cost of all materials as required complete:- i) In Cement mortar 1:4 (1 cement : 4 fine sand)	48.493	Sqm
185	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. all complete. I) Fixed to steel windows by welding.	81.000	Kg

Sl. No.	Description of Items	Quantity	Unit
186	and fixing 1mm thick M.S. sheet with frame of 40x40x6mm angle iron and m,s. gusset plates at the junctions and & with cleats with bolts & nuts, rivets, ocking arrangement, handles, hooks & eyes, 'inlets inc,...-lingembedding in cement ,onorete of required grade for fixing in iosition, all necessary fittings, including ippiying a priming coat of approved steel 'rimer etc. complete as required) Using flats 30x6mm for diagonal braces and :entral cross piece.	7.920	Sqm
187	steel work in built up tubular (round, square rectapgular hollow tubes etc.) trusses etc., ncluding cutting, hoisting, fixing in position and applying a priming coat of approved steel Primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes	180.000	Kg
188	Providing and fixing M.S. round holding down bolts withnuts and wahser plates complete as per standard design.	15.000	Kg
189	Providing and laying cement concrete 1:2:4 (1 cement 2 fine sand : 4 graded well burnt brick aggregate) flooring finished with a floating coat of neat cement including cement slurry, rounding of edges and strips and cost of glass strips etc. complete. i) 40 mm thick	19.153	Sqm
190	Providing corrugated G.S. sheet roofing including vertical/curved surface fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in horizontal/ vertical or curved surfaces) excluding the cost of purlins, rafters and trusses and including =cutting to size and shape wherever required.i) 0.63 mm thick Zinc Coating not less 275 Gm/m2	32.500	Sqm
191	12 mm cement plaster of mix. i) In cement mortar 1:4 (1 cement : 4 fine sand)	55.000	Sqm
192	15 mm cement plaster on the rough side of single or half brick wall of mix In Cement mortar 1:4 (1 cement : 4 fine sand	60.000	Sqm
193	6 mm cement plaster of mix i• Cement mortar 1:4 (1 cement : 4 fine sand)	20.000	Sqm
194	Neat cement punning	25.000	Sqm
195	Distempering with dry distemper of approved brand and manufacture (two or more coats) of required shade on new work, over and including water thinnable priming coat to give an even shade. [Payment shall be made after submission of Test Certificate issued by the Manufacturer]	55.000	Sqm

Sl. No.	Description of Items	Quantity	Unit
196	Finishing walls with water proofing ent Paint of required shade of approved brand and manufacture [Payment shall be made after submission of Test Certificate issued by the manufacture: New work (two or more coats applied @ 3.84 kh/10 sqm	60.000	Sqm
197	an even shade [Payment shall be made after submission of Test Certificate issued by colour to the Manufacturer] : 12 49.1 New work (two or more coats) including a coat of appropriate steel primer but excluding a coat of mordant solution	60.000	Sqm
198	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 fine sand : 6 graded well burnt brick aggregate 20 mm nominal size) over 75mm bed of dry brick ballast 40mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth.	13.000	Sqm
199	Providing and placing of G.I. pipe over the pump house on top portion of the R.C.C. column as per specification and the direction of the Engineer-in-charge. i) 150 mm dia	6.000	m
200	Providing and fitting fixing steel sheet enclosed switch fuse unit (suitable for DIN fuses), triple pole with Neutral Link (TPN), 415/500 Volt, L & T / Havells / BCH make etc. complete as per specification and direction of the Engineer-in-charge. i) 63 amps	1.000	Nos
201	ii)100 amps	1.000	Nos
202	Poviding and fitting fixing of Fully Automatic Star Delta type Motor starter (3 ph. 50 Hz, 415V, in Steel Sheet Enclosures with Contractors and Timer etc. complete suitable for submersible Pump L & T, BCH, ABB make as per specification and direction of the Engineer-in-charge.i) 25 HP/18.5 kw Relay range within 20-32 + 10%	1.000	Nos
203	ii) 35 HP/26 kw Relay range within 20-32 + 10%	1.000	Nos
304	Providing and fitting fixing of 6 feet x 4 feet x 1 inch (thickness) Gamair wood / plywood pannel board for fitting fixing of electrical items, in/c 2 nos MS angle post (size 2 inch x 2 inch x 9 feet), nuts & bolts etc. for irrection of the same by 1:1.5:3 cement concrete casting (1 feet x 1 feet x 2 feet) below the ground level and painting two or more coats & plastic paint as per specification and direction of the Engineer-in-charge.	1.000	Nos
205	Providing and fitting fixing with PVC insulated single core multistrand Copper cable conforming to IS : 694 for inter connection with all electrical equipments of the panne! board as per specification and direction of the Engineer-in-charge. i) 10 sqmm	1.786	Mtr.
206	ii) 16 sqmm	23.214	Mtr.
207	Providing and fitting fixing of moving iron type, Range 0-500 V, 96 mm x 96 mm size AC Volt meter (L & T / AE make) with selector switch as a electrical instrument of the pannel board as per specification and direction of the Engineer-in-charge.	1.000	Nos

Sl. No.	Description of Items	Quantity	Unit
208	Providing and fitting fixing of moving iron type, Range 0-100/0-200 amps, 96 mm x 96 mm size AC Amps meter direct reading type (L & T/ AE make) with selector switch and CT coil as a electrical instrument of the pannel board as per specification and direction of the Engineer-in-charge.	1.000	Nos
209	per specification and direction of the Engineer-in-charge	1.000	Nos
210	Providing earthing with perforated 40 mm dia g.i. pipe Medium class) (12 mm dia erforatior,!aYing of 4 mm dia GI wire from rearm electrode to panel, including excavating hole of 600 mm dia and refilling with Salt and Charcoal / coke in alternate layers of 300 mm as per standard specification and direction of the Engineer-in-charge. i) For 3-,phase connection with 4.00 mtr. Lone G.I. pipe	1.000	Nos
211	Providing and fitting fixing 3 phase indicatin lamp flited with panel board with three different colour lamps with batten holder complete as per specification and direction of the Engineer-in-charge.	1.000	Nos
212	Providing and fitting fixing heavy duty box type (Resin filled) power factor correction capacitor L & T make etc. complete as per 1 specification and direction of the Engineer-in- 7.857 charge i) 5-15 kVAr 440 V	7.857	KVAR
213	Providing and fitting fixing Single phasing preventor +selectable under voltage +selectable over voltage on delay 5 sec & off delay 15 sec phase asymmetry 10% L & T IBCH/HAVELS/Siemens etc. make complete as per specification and direction of the Enaineer-in-charge	1.000	Nos
214	**Providing & laying of pipeline including installation of 01(one) No pump motor set.**		
215	Providing, fixing and laying rigid UPVC pipes conforming to IS : 4985 jointing with couplers, of same class conforming to IS : 10124 (Pt-11) with solvent cement conforming to IS : 14182 including testing of joints complete but excluding the cost of specials like bend, tees etc. which will be paid separately) as per CPWD specification and direction of the Engineer - in - charge. A. Class - 3 (working pressure 6.0 kg / cm2) --(63 mm OD	778.500	Mtr.
	ii) 9Omm OD	1964.250	Mtr.
	iii) 11Omm OD	1185.500	Mtr.
	iv) 14Omm OD	964.250	Mtr.
216	Providing, fixing and laying fabricated UPVC bend of required degree conforming to IS : 10124 (part 8 / 9 / 10 / 11 / 12 / 13) with solvent cement conforming to IS : 14182 including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge. i) 63 mm dia	3.000	Nos
	ii) 9Omm dia	9.000	Nos
	iii) 11Omm dia	6.000	Nos
	iv) 14Omm dia	4.000	Nos

Sl. No.	Description of Items	Quantity	Unit
217	Providing, fixing and laying fabricated UPVC end cap conforming to IS : 10124 (Part 4) with solvent cement conforming to IS : 14182 including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge i) 63 mm OD	2.000	Nos
	ii) 90 mm dia	5.000	Nos
	iii) 110 nim dia	1.000	Nos
218	including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge. i) 63x63 mm dia	2.000	Nos
	ii) 90 x 90 mm dia	7.000	Nos
	iii) 110 x 110 mm dia	2.000	Nos
	Iv) 140 x 140 mm dia	2.000	Nos
219	Providing, fixing and laying fabricated UPVC straight reducer conforming to IS 10124 (Part 3) with solvent cement conforming to IS 14182 including testing of joints complete as per CPWD specification and direction of the Engineer - in - charge. i) 75 x 63 mm dia	1.000	Nos
	ii) 90 x 75 mm dia	1.000	Nos
	iii) 110 x 90 mm dia	4.000	Nos
	iv) 140 x 110 mm dia	3.000	Nos
220	Providing, fixing and laying fabricated UPVC tailpiecewith MS flange (8 mm thik) conforming to IS : 10124 (Part6) with solvent cement conforming to IS : 14182 includ testing of joints complete as er CPWD specification anddirection of the Engineer - in charge. i) 90 mm dia	1.000	Nos
	iii) 11Omm dia	4.000	Nos
	iv) 14Omm dia	4.000	Nos
221	Providing, and fixing G.I. Pipes median class as per IS : 1239 with latest amendment complete with G.I. ng fittings including trenching and refilli, cutting and making good the Walls etc. complete as per CPWD specification and direction of the Engineer - in - charge.A. External worki) 15 mm dia nominal bore	150.000	Mtr.
222	Providing and fixing C.I. non-return valve of approved quality as per of CPWD specification and direction of the Engineer-in charge. i) 80 mm nominal bore	1.000	Nos
	ii) 100 mm nominal bore	1.000	Nos
223	Providing and fixing brass ferrule with C.1. cover conforming to IS: 2692 including boring and tapping the main as per CPWD specification and direction of the Engineer - in charge. i) 10 mm nominal bore	150.000	Nos
224	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) as per CPWD specification and direction of the Engineer - in -charge. i) 80 mm dia. A. PN-1.0	1.000	Nos
	(ii) 100 mm dia. A. PN-1.0	2.000	Nos
	iii) 125 mm dia. A. PN-1.0	1.000	Nos

Sl. No.	Description of Items	Quantity	Unit
	ii) 150 mm dia. A. PN-1.0	2.000	Nos
225	Providing and laying D.I. specials of class K- 12 suitable for push-on jointing as per IS: 9523 as per CPWD specification and direction of the Engineer - in-charge. i) Upto 300 mm dia.	1.000	Tonne
226	Charges for push-on (Tyton) joints to centrifugually (Spun) cast iron pipes or ductile iron pipes including testing of joints and including the cost of rubber gasket as per CPWD specification and direction of the Engineer-in-charge. i) 100 mm dia	2.000	Nos
	il) 150 mm dia	17.000	Nos
227	and laying & Centrifugally Cast iron Ductile iron Class K-7 Pipes informing to IS: 8329 as per CPWD notification and direction of the Engineer-in-charge. i) 100 mm dia Ductile Iron Class K-7 pipes.	7.143	Mtr.
	150 mm dia Ducsie Iron Class K-7 pipes	92.857	Mtr.
228	Charges for cutting D.I. pipe with mechanical cutter as per CPWD specification and direction of the Engineer-in-charge i) 100 mm dia	1.000	Nos
	iii) 150 mm dia	4.000	Nos
229	Previding and foring U.P.V.C. service saddle as per CPWD specification and direction of me Engineer-in-charge i) 63 mm dia with 15 mm dia opening	95.000	Nos
	ii)90 mm dia with 15 mm dia opening	30.000	Nos
	iii) 110 mm dia with 15 mm dia opening	15.000	Nos
	iv) 140 mm dia with 15 mm dia opening	10.000	Nos
230	Providing and laying of flexible PVC pipe (conforming to IS:7634) complete as per specification and direction of the Engineer-in -charge (cost of earth work and fittings will be paid separately). i) 15 mm dia	900.000	Mtr.
	ii) 25 mm dia	100.000	Mtr.
231	Excavating trenches of required width for pipes, cables etc. including exacavation for sockets, dressing of sides where required, ramming of bottoms, depth upto 1500 mm (slope-1 in 200) including getting out the excavated soil and backfilling of soil as required after laying of pipeline, in layers not exceeding 200 mm in depth including consolidating each deposited layer by ramming, watering etc. and disposing of surplus excavated soil with all required leads as per Chapter-2 of CPWD specification and direction of the Engineer-in-charge. A) For UPVC pipes in new work. a. All kind of Soils i) For pipes not exceeding 90 mm dia	3553.357	Mtr.
	ii) For pipes exceeding 90mm dia but not exceeding 300mm dia.	2171.500	Mtr.
232	B) For Gl/C/Di pipes in new work. a) All kind of Soils i) For pipes exceeding. 90mm dia but not exceeding 300mm dia.	101.000	Mtr.

Sl. No.	Description of Items	Quantity	Unit
233	Providing and fixing G.I. Bend /elbow in the pipe line including testing of joints complete as per CPWD specification and direction of the Engineer in-charge. i) 15 mm dia	30.000	Nos
	ii) 25 mm dia	2.000	Nos
	iv) 80 mm dia	1.000	Nos
	v) 100 mm dia	1.000	Nos
234	Providing and fixing G.I. Reducer with the pipe line including testing of joints complete as per CPWD specification and direction of the Engineer-In-charge. i) 100 x 80 mm dia	1.000	Nos
235	Providing and fixing G.I. socket as per CPWD specification and direction of the Engineer-in-charge. i) 15 mm dia	38.000	Nos
	ii) 25 mm dia	8.000	Nos
236	Providing and fixing G.I. union as per CPWD specification and direction of the Engineer-in -charge i) 15 mm dia	142.000	Nos
	ii) 25 mm dia	7.000	Nos
237	The GI pipe (conforming to 16 : 1239 medium class) into 3.05 mfr. tong and welding the same with GI flange as per specification and direction of the Engineer-in-charge (G.I. Pipe will be provided by the agency at his own cost & risk). i) For 80 mm dia G.I. pipe with 10 mm thick GI flange	10.000	Each
238	Providing, fitting fixing and installation of 10,000 GPH x 76 mtrs. Head water lubricated submersible pump of maximum 150 mm outer dia. With maximun 10(Ten) stages coupled with required water and non-cover loading submersible motor suitable for 340-440 volts, 3 phase 50Hz, AC supply and star delta method ofstarting along with 35 mtrs. x 2 x 3 x 4 sq.mm joint less PVC 3 (three) core double length flat cable (continuous length) of suitable size fitted with submersible motor, suction case, strainer; coupling key, vertical non- return valve cum discharge case including supplying of 10 Nos. suitable cable guard with clips and nuts & bolts, 2 (two) pair M.S. column clamps as per direction of Engineer-in-charge conforming to terms & conditions of the contract (Each pump with motor shall consists of stainless stell closed - type impeller , C.I, bowl, C.1 discharge case, pump shaft (styainless steel), bush (bronze), shaft sleeve (bronze/ chromium), sand guard, winding rotor, stator, counter thrust plate, thrust plate, thrust bearing segment etc. conforming to relevant BIS codes of madeDUKE/KSBN/WPIL/CRI).	1.000	Nos

Sl. No.	Description of Items	Quantity	Unit
239	Providing, fitting fixing and installation of 5000 GPH x 76 mtrs. Head water lubricated submersible pump of maximum 150 mm outer dia. With maximun 10(ten) stages coupled with required water and non-cover loading submersible motor suitable for 340-440 volts, 3 phase 50Hz, A.0 supply and star delta method of starting along with 35 mtrs. x 2 x 3 x 4 sq.mm joint less PVC 3 (three) core double length flat cable (continuous length) of suitable size fitted with submersible motor, suction case, strainer, coupling key, vertical non- return valve cum discharge case including supplying of 10 Nos. suitable cable guard with clips and nuts & bolts, 2 (two) pair M.S. column clamps as per direction of Engineer-in-charge conforming to terms & conditions of the contract (Each pump with motor shall consists of stainless stell closed type impeller , C.I. bowl, C.I discharge case, pump shaft (styainless steel), bush (bronze), shaft sleeve (bronze/ chromium), sand guard, winding rotor, stator, counter thrust plate, thrust plate, thrust bearing segment etc. conforming to relevant BIS codes of made DUKE/KSBJ/WPIL/CRI).	1.000	Nos
240	Supplying and fitting fixing of submersible pump and motor set 5HP(2500 GPH), head (as per requirement), 350 to 420 V(TP), 50 Hz. At various location in/c trial run as per specification and direction of the Engineer-in-charge	1.000	Set
241	Labour charge for fitting fixing and lowering 2500/5000/7500/10000/15000/20000 GPH capacity water lubricated vertical submerissible pump with motor including column assembly upto 100 ft. by heavy duty chain pully block as per direction of the engineer-in-charge.(Pump motor set will be supplied by the department at free of cost). (Only for 2500 GPH pump motor)	1.000	Nos
242	fabrication of column pipe fitting fixing of G.I. flange by cutting Gl conforming to IS : 1239 medium access) into 3.05 mtr. long and welding the 5.rr- e with GI flange as per specification and rection of the Engineer-incharge (G.I. pipe III be provided by the agency at his own & risk) For 50 mm dia G.I. pipe with 10 mm thick GI angle	5.000	Nos
243	Providing and fitting fixing of pressure meter(- 14.0 Kg/ scicm.) as per specification and ,s per specification and the direction of the engineer - in-charge.	1.000	Nos
244	Making road crossing by horizontal boaring or smooth laying of UPVC/Cl/DI/GI pipes etc.)f required dia complete as per specification and the direction of the Engineer-in-charge. A. By manual means	208.250	Mtr.

Sl. No.	Description of Items	Quantity	Unit
245	onstructing masonry Chamber 90x 90 x 100 cm, inside with 75 class designation brick work in cement mortar 1:4 (1 cement : 4 fine sand) for sluice valve,with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 190 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design : '(i) With Second Class bricks	3.000	Nos
246	Providing and fixing in position Precast RCC hydrant post of size 100 mm dia (made with reinforced cement concrete 1 : 1.5 : 3 (1 cement : 1.5 fine sand : 3 graded well burnt brick aggregate 1st class 12 mm nominal size) and steel reinforcement (TMT bars)3 nos 8 mm dia 950 mm long and 7 Nos 6 mm dia ties including plastering the surface with 6 mm thick cement mortar 1 : 3 (1 cement: 3 sand) finished with a floating coat of nest cement including providing & embedding 15 mm dia G.I. pipe (medium class as per IS : 1239) with necessary GI fittings like 2 Nos elbow, 1 no socket, 2 nos nipple 225 mm long and fitting fixing of PVC bib cock with GI socket complete with all earth work required including refilling etc. complete as per approved drawing (Drawing No-06/CE/ACE/P&DLYDWS/2022-23), specification and direction of Engineer-in-charge.	150.000	Nos
247'	Providing and fixing in position Precast RCC platform of size 900 mm x 900 mm x100 mm with curb of size 75 x 75 mm keping an opening of 200 mm wide for surface drain of 60 cm length of size (200 rnmx150 mm) in a suitable place for draining out of grey water (made with cement concrete 1:1.5:3 (1 cement: 1.5 sand: 3 graded well burnt brick agareaate 12 mm nominal size) and steel reinforcement(TWIT bars) 6 nos. 8 mm dia in both direction including plastering the exposed surface with 6 mm thick cement mortar 1:3 (1 cement :3 sand) for platform &12 mm cement plaster(1:4) (1 cement :4 sand) for surface drain finished with a floating coat of neat cement complete with all earth work required including refilling etc. complete as per approved drawing (Drawing No-06/CE/ACE/P&DU/DWS/2022-23), specification and direction of Engineer-in¬charge.	150.000	Nos

Sl. No.	Description of Items	Quantity	Unit
248	Providing and fitting fixing of hoarding cum display board of JJM of size 8 ft. x 6 ft. (2.40m x 1.80 m) with frame comprising of 40 mm dia GI pipe (medium class) around the board, 2 nos. 25 x 25 x 4 mm size MS vertical stiffners with equally placed and 1 no. 25 x 25 x 4 mm size MS horizontal stiffner centrally placed and 2 mm thick MS Sheet (2.40 m x 1.80 m) with necessary welding, painting, lettering and erected vertically in such a way bottom of the board shall be placed 900mm above the Ground Level with2 nos. 40 mm dia GI pipe embedded in cement concrete block of 1:2:4 (1 .Cement : 2 fine Sand: 4 graded well burnt brick aggregate 20 mm nominal size) of 300 mm x 300 mm & 900 mm total depth out of which 150 mm shall be projected over GL etc. complete as per specification and direction of the Engineer-in-Charge.	1.000	Nos
249	Hiring charge for truck (medium duty) 06(six) wheeler for carrying of drinking water with truck mounted syntax tank having 1000 (one thousand) Ltr capacity each 4(four) nos minimum from nearest DWS deep tube well scheme in/c loading, carrying and distribution of water to the different crisis pocket in/c cost of driver, helper and as per instruction of the Engineer-in- charge.		
	(i) Detension charge	120	1800
	(ii) Distance travelled	5400	10
250	Hiring charge for truck (medium duty) 4(four) wheeler for carrying of drinking water with truck mounted syntax tank having 1000 (one thousand) Ltr capacity cach 02(two) nos minimum from nearest DWS deep tube well scheme in/c loading. carrying and distribution of water to the different crisis pocket in/c cost of driver, helper and as per Instruction of the Engineer-in- charge.		
	(i) Detension charge	120	1200
	(ii) Distance travelled	5400	9.5
251	Excavating trenches', of required width for pipes, Gables etc. including exacavation for sockets, dressing of sides where required, ramming of. bottoms, depth upto 1500 mm (slope-1 in 200)including getting out the excavated soil and backfilling of soil as required after laying of pipeline, in layers not exceeding 200 mm in depth including consolidating each deposited laye(by ramming, watering etc. and disposing of surplus excavated soil with all required leads as per Chapter - 2 of CPWD specification and direction of the Engineer - in -		
	A. For UPVC pipes in new work		
	For pipes exceeding 90 mm dia but not exceeding 300 mm dia	600	Mtr
	B. For G.I. / C.1. / D.I. pipes in new work		
	For pipes exceeding 90 mm dia but not exceeding 300 mm dia	700	Mtr
252	Providing, fixing and laying rigid UPVC pipes conforming to IS : 4985 jointing with couplers, of same class conforming to IS : 10124 (PtII) with solvent cement conforming to IS : 14182 including testing of joints complete (but excluding the cost of specials like bend, tees etc. which will be paid separately) as per ,cp wiD specification and irection of the Engineer - in - charge. A. Class - 3 working 'pressure 6.0 kg / cm2)		

Sl. No.	Description of Items	Quantity	Unit
	110 mm OD	300	Mtr
	140 mm OD	300	Mtr
253	Providing and fixing G.I. pipes medim class as per IS : 1239 with latest amendment complete with G.I. fittings including trenching and refilling, cutting and making good the walls etc. complete as per CPWD specification and direction of the Engineer - in -charge. A. External work.		
	100 mm dia. nominal bore	300	Mtr
	150 mm dia. nominal bore	500	Mtr
254	Providing and laying S & S Centrifugally Cast (Spun) Ductile Iron Class K-7, Pipes conforming to IS : 8329 as per CPWD specification and direction of the Engineer - in - charge		
	100 mm dia Ductile Iron Class K-7 pipes.	350	Mtr
	150 mm dia Ductile Iron Class K-7 pipes.	350	Mtr
255	Providing and laying D.I. specials of class K - 12 suitable for push - on jointing as per IS : 9523 as per CPWD specification and direction of the Engineer - in - charge. Upto 300 mm dia	0.50	ton
256	Charges for laying in position S & S or flanged D.I. special such tees, bends, collars, tapers and caps etc. (excluding cost of specials) as per CPWD specification and dirction of the Engineer - in -charge.	0.50	ton
257	Charges for fixing and laying rigid UPVC pipes jointing with couplers, solvent cement including testing of joints complete (excluding the cost of pipes, couplers, solvent cement which are to be issued from the department free of cost and specials like bend, tees etc. which will be paid separately) as per CPWD specification and diretion of the Engineer - in - charge.		
	110mm OD	300	Mtr
	140 mm OD	300	Mtr
258	Charges for laying S t& S Centrifugally Cast (Spun) Ductile Iron Class K-7 Pipes conforming to IS : 8329 as per CPWD specification and direction of the Engineer - in - charge		
	110 mm dia	300	Mtr
	150 mm dia	300	Mtr
259	Making road crossiqg by horizontal boaring for smooth laying of UPVP/Cl/DI/GI pipes etc. of required dia complete as per Specification and the direction of the Engineer-in-charge. A. By manual means	100	Mtr
260	Charges for dismentling PVC / HDPE pipe after necessary excavation of earth including washing and stacking of pipes properly at site with all leads and lifts and backfilling of soil as required after laying of pipeline, in layers not exceeding 200 mm in depth including consolidating each deposited layer by ramming, watering et?. complete as per specification & direction of the Engineer-in-charge.		
	110 mm dia	300	Mtr
	140 mm dia	300	Mtr

Sl. No.	Description of Items	Quantity	Unit
261	Charges for fixing IC.I. sluice valves with cap complete with bolts., nuts, rubber insertions etc. (the tail pieces if requireidl will be paid separately) as per CPWD specification and direction of the Engineer - in - charge.		
	i) 100mm dia. A. PN - 1.6	10	No
	ii) 150 mm dia. A. PN - 1.6	10	No
262	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if requiredl will be paid separately) as per CPWD specification ind direction of the Engineer - in - charge.		
	i) 100mm dia. A. PN - 1.6	5	No
	ii) 150 mm dia. A. PN - 1.6	7	No
263	Charges for cutting D.I. pipe with steel saw by manual means as per CPWD specification and direction of the Engineer - in - charge.		
	i) 100 mm dia	50	
	ii) 150 mm dia	50	
264	Dismantling old Cl/DI pipes including excavation and refilling ttrenches after taking out the pipes,breaking lead caaulked jointspelting of lead and making into blocks including stacking of pipes at site lead upto 50 mtr as per CPWD specification and direction of the Engineer4n-Charge		
	i) 100 mm dia	300	Mtr
	ii) 150 mm dia	300	Mtr
265	Charges for push-on (Tyton) joints to centrifugually (Spun) cast iron pipes or ductile iron pipes including testing of joints andl including the cost of rubber gasket as per CPWD specification and direction of the Engineer - in - charge		
	i) 100 mm dia	100	No
	ii) 150 mm dia	100	No
266	Labour charge for clearing of clouded deposited iron in the PVC pipe of 140, 110, 90 mm dia pipe by chain lead pully system in/ disposal of iron from the site and thoroughly washing the pipe with water complete as per direction of the\Engineer-in-charge	1200	Mtr
267	Labour charge for clearing of deposited iron clouded in the CI/DI pipe line of different dia (200, 150mm dia) by chain 'putty system in/c washing the pipe by water complete, as direction 'of the Engineer-in-charge.	1200	Mtr
268	Earth work in excavation,by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of oms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. a) All Kind's of Soil	20	cum
269	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating.ech deposited layer by ramming and watering, lead up to 50 ni and lift upto 1.5 m.	15	cum
	A)All kindS of soil	2.5	cum

Sl. No.	Description of Items	Quantity	Unit
270	Supplying and filling in: plinth, under floor, foundations etc. with sand (fine) from local quarry with all lifts including spreading in horizontal layers, watering, grading to required slope, ramming, consolidating and compacting each layer by using plate compactor Or by any suitable method complete		
271	Providing and laying in position cement concrete of specified grade excluding the cost bf centering and shuttering.	2.5	cum
	i) 1:2:4 (1 Cement: 2 find sand : 4 well burnt brick aggregate 40 mm nominal size)	1.5	cum
	ii) 1:3:6 (1 cement : 3 fine sand : 6 graded well burnt brick aggregate of 40 mm nominal size)	1.5	cum
	iii) 1 :4:8 (1 cement : 4 fine sand : 8 graded well burnt brick aggregate of 40 mm nominal size)		
272	Providing and laying inpOsition specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforceinent- All work upto plinth level:	15	cum
	i) 1:2:4 (1Cement: 2 fine sand : 4 graded well burnt brick aggregate 20 mm nominal size		
	Centering shuttering including struttings, propping etc. and removal of form work for:		
	iii) Columns, Pillars, Piers, Abutments, Posts and Struts with wooden plank	50	sqm
273	ReinforceMent for R.C.C. work including straightening, cutting, bending, placing in positiOn and binding all complete upto plinth Level		
274	i) Thermo-Mechanically Treated bars of gradeFe-500D or more	750	kg
	12 mm cement plaster of.Mix.	75	sqm
	i) In cement mortar 1:4 (1 cement : 4 fine sand)	75	sqm
275	Neat cement punning.		
276	Labour charge for clearilg of clouded PVC 01)0010 itotn in the pipe of 140, 110, 90 'lead mot Oa pipe by chain dully system in/c dioposel of iron from the site and thoroughly washing the pipe with water complete as per direction of the Engineer-In-charge,	3000	mtr
277	Labour charge for clearing of deposited iron clouded in the Cl/DI pipe fine, of different dia (200, 150mm dia) by chain piiilly system in/c washing the pipe by water complete as per direction of the Engineer-In-charge,	500	mtr
278	Providing and fitting fixing of spandal 0 valve of approved clualit‘nas ner. dlrP Engineer In charge		
	i) 100 mm dia.	15	No
	i) 150 mm dia.	10	No

Note:- The details of items/quantities/works to be executed for shifting of utilities is tentative. All works/quantities/ miscellaneous items to be executed at site as per detailed estimate of utility owning department, without any additional claim/COS.

Sr. No	Type of Utility	Unit	Quantity	Remarks
B	**Water/Sewage pipeline**			
B1	**Water supply pipeline (Drinking & Water Supply Dept., PHED)**			The details of items/quantities/works to be executed for shifting of utilities is tentative. All works/quantities/ miscellaneous items to be executed at site as per detailed estimate of utility owning department, without any additional claim/COS.
1.	GI Pipes (CWGM) 40mm	m		
2.	HDPE Pipes 50mm Dia	m		
B2	Other Items			
1.	TP of RSF 2.00m² with internal connection, Back wash with Solar Pannels	No.		
2.	CWR 15KL Cap. With Chemical dosing pump	No.		

Schedule-C

Schedule-C

(SeeClause2.1)

Project Facilities

1. Project Facilities

The Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement. Such Project Facilities shall include:

(a) Toll plaza[s];

(b) Road side furniture;

(c) Pedestrian facilities;

(d) Tree plantation;

(e) Truck lay-byes;

(f) Bus-bays and bus shelters;

(g) Rest areas; and

(h) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

(a) Toll Plaza: Nil

(b) Roadside Furniture:

S. No.	ProjectFacility	Location	Design Requirements	Other essential details
1	Traffic Sign & Pavement marking	Entire Length	As per Schedule D	
2	Km stone, Hectometer Stone, 5thkilometre stone	Entire Length	As per Schedule D	
3	Boundary Stone	Entire Length	As per Schedule D	
4	Roadside Delineator, marker & Road Stud	As per manual	As per Schedule D	

Note: Provide adequate details of each Project Facility to ensure their design and completion in accordance with the project- specific requirements and the provisions of the Manual.

(c) Pedestrian Facilities:

Pedestrian facilities in the form of footpath cum drain shall be provided in the built-up area (refer typical cross-section drawing). Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of pedestrians while crossing in consultation with Authority.

(d) Tree Plantation:1670 nos. of trees should be planted & maintained by EPC Contractor @3mc/c in Single ROW within Proposed ROW as per IRC :SP:21-2009 on Teliamura Bypass

(e) Truck Lay Byes:1no.

S. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details
1	Truck Lay Bye	434+500	Both side	-

Note: - The Design & Specifications of Truck Lay-bye shall follow IRC :SP-84:2019 & finalized in consultation with Authority Engineer.

(f) Bus-bays and bus shelters: 10 Nos (Both Side).

S. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details	Remarks
1	Bus Shelter	421+850	Separation from main carriageway	Start Taper-22 m, Straight-15 m, End Taper-22 m	Both Side
2	Bus Shelter	428+200			Both Side
3	Bus Shelter	429+600			Both Side
4	Bus Shelter	433+100			Both Side
5	Bus Shelter	436+900			Both Side
6	Bus Shelter	438+000			Both Side
7	Bus Shelter	439+900			Both Side
8	Bus Shelter	442+460			Both Side
9	Bus Shelter	443+300			Both Side
10	Bus Shelter	446+899			Both Side

Note: - The Design & Specifications of Bus Shelter shall follow IRC: SP-84:2019 & finalized in consultation with Authority Engineer.

(g) Rest areas: Nil

S. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details
Nil				

Note: - The Design & Specifications of Rest Area with Public Toilet shall follow IRC: SP-84:2019 & finalized in consultation with Authority Engineer.

(h) Others:

(i) Street Lighting

Street lighting shall be provided in the built-up area, bus bay, truck lay bye and major junction location. Other than these, Street Lighting shall be provided at Major Bridge, VUP and LVUP locations including approaches.

(j) Environment

The Project Highway during design, construction and maintenance during implementation period shall conform to the environmental rules and regulations in force. The Construction Contractor shall be responsible for the same.

(k) Rainwater Harvesting Structures

Along project highway water harvesting structures shall be provided at 500m interval (Minimum 51 Nos shall be constructed), however spacing may be adjusted as per site

condition in consultation with Authority Engineer. Proper markers shall be provided at each Rainwater Harvesting Structure (RWHS) to identify these easily. The level of the RWHS shall be kept in such a way that it remains efficiently functional.

Schedule-D

Schedule-D

(SeeClause2.1)

Specifications and Standards

1. Construction

The Contractor shall comply with the Specifications and Standards set forth in Annex- I of this Schedule-D for construction of the Project Highway.

2. Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents:

[Manual of Specifications and Standards for Four Laning of Highways (IRC: SP: 84-2019), referred to herein as the Manual]

[Note: Specify the relevant Manual, Specifications and Standards]

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Annex- I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for [Four-Laning of Highways (IRC: SP:84-2019)], referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

(i) The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and" Agreement" respectively.

(ii) [Not withstanding anything to the contrary contained in Paragraph-1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forth below:]

(iii) [Note1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements.]

Sr. No.	Cl. No.	Provisions in Clause	Deviation from Manual
1	Fig. 2.2, Fig. 2.3, Fig. 2.9	New Typical Cross Section	The carriageway width, paved shoulder width, earthen shoulder width, median width, kerb shyness shall be as per the TCS
2	Fig. 7.1B, Fig. 7.2A, Fig. 7.2B, Fig. 7.8	New Typical Cross Section	Cross section of Culverts, Major Bridge, Minor Bridge and Grade Separated Structures.
3	Clause 5.7	Pavement Components & Materials.	Natural granular material shall be use in Shoulders.

Annexure- D-I

Typical Cross Sections

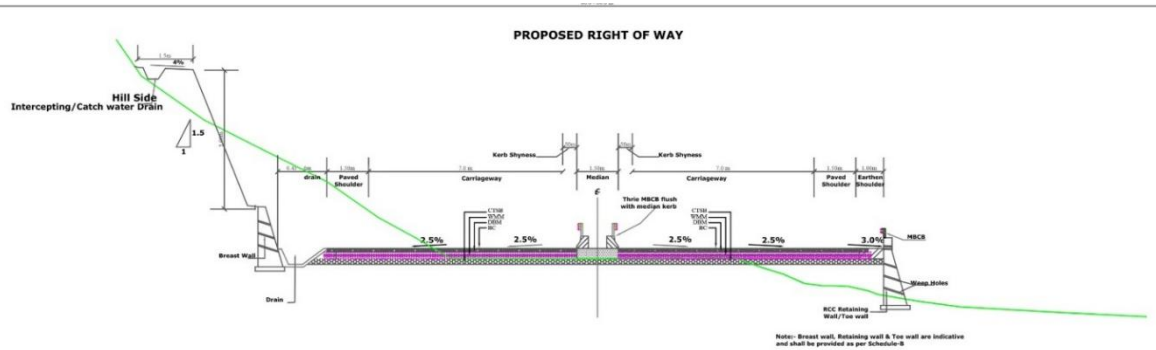


Fig 2.9 of IRC SP 84 2019
TCS-1
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with raised median one side retaining wall & one side hill

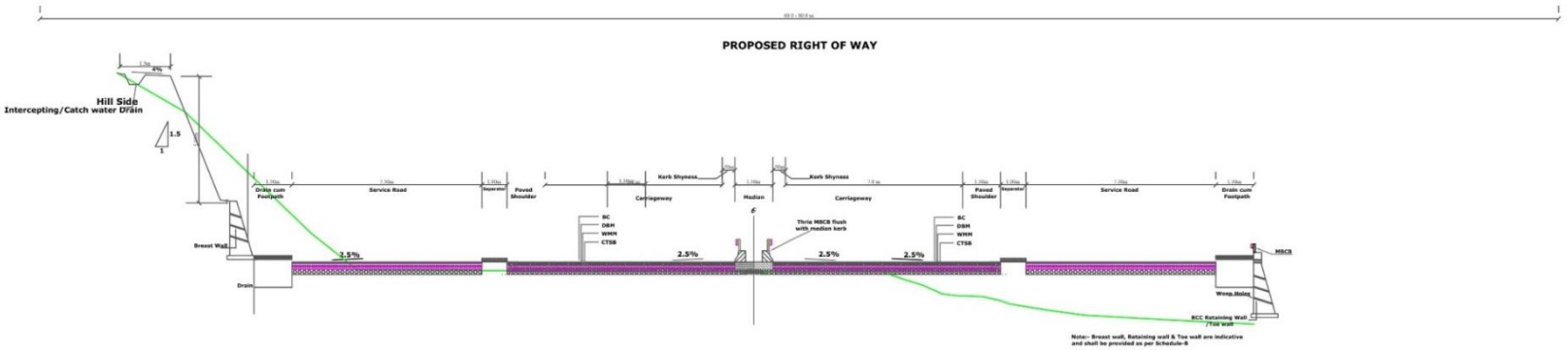


Fig 2.9 of IRC SP 84 2019
TCS-1A
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with service road with raised median one side retaining wall & one side hill

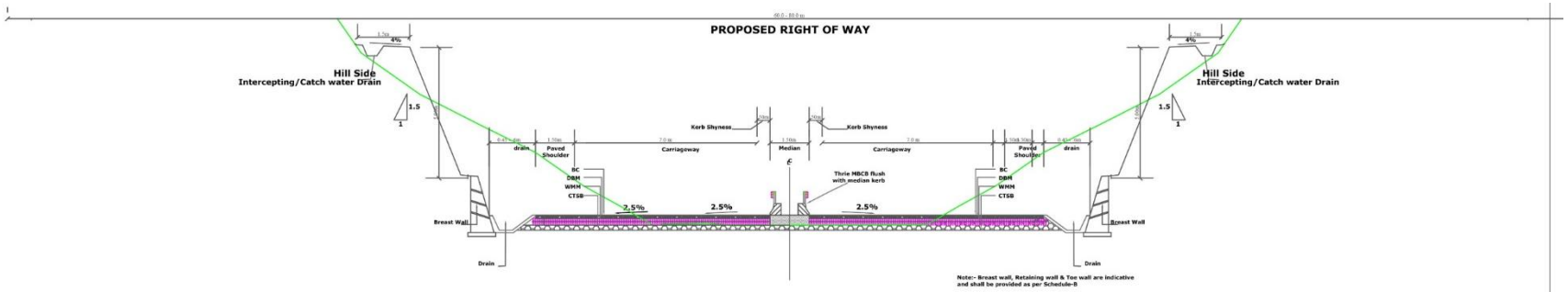


Fig 2.9 of IRC SP 84 2019
TCS-3
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with raised median both side hill

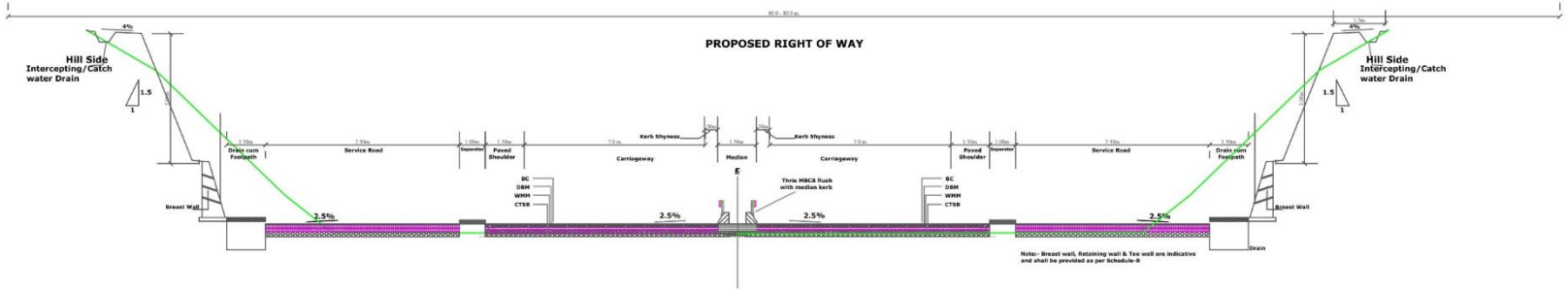


Fig 2.9 of IRC SP 84 2019
TCS-3A
Typical Cross Section
(Open Country- Mountainous Terrain)
4- lane divided carriageway with service road with raised median both side hill

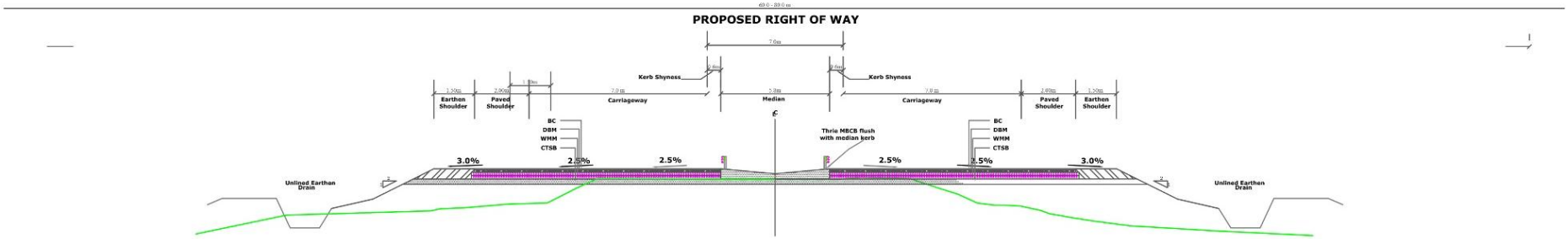


Fig 2.3 of IRC SP 84 2019
TCS-4
Typical Cross Section
(Open Country- Plain/Rolling Terrain)
4- lane divided carriageway with depressed median

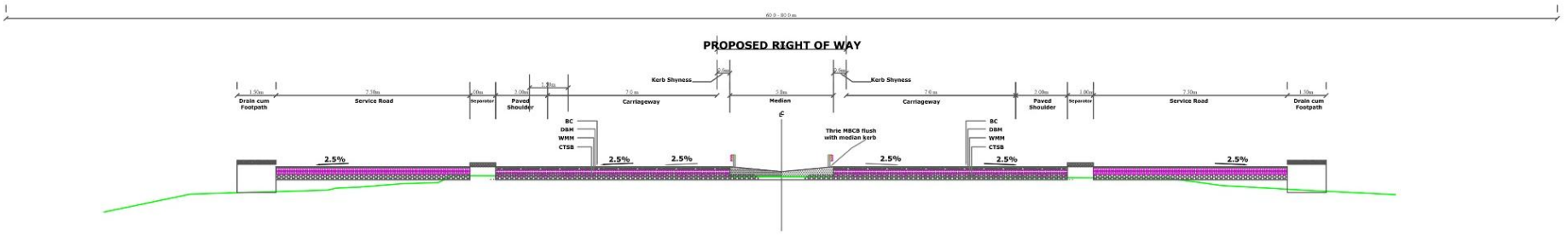
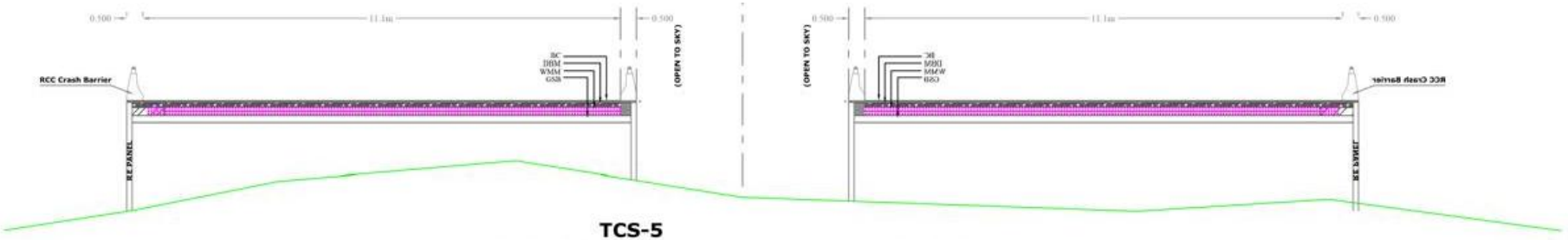
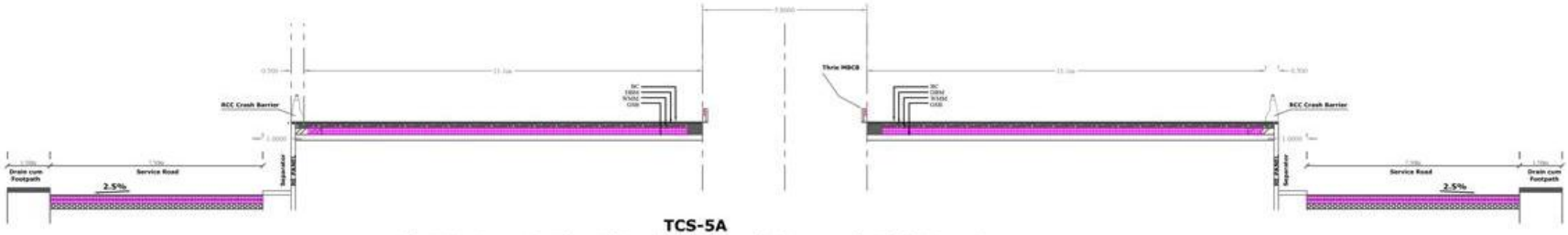


Fig 2.3 of IRC SP 84 2019
TCS-4A
Typical Cross Section
(Open Country- Plain/Rolling Terrain)
4- lane divided carriageway with depressed median



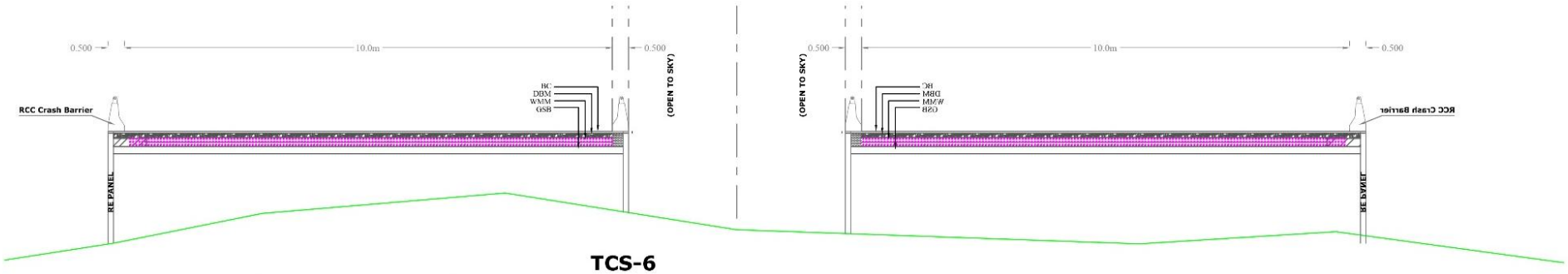
TCS-5

Fig: 7.8 Cross-Section of Grade Separated Structure in Plain Terrain
Vehicular Underpass and Elevated Section



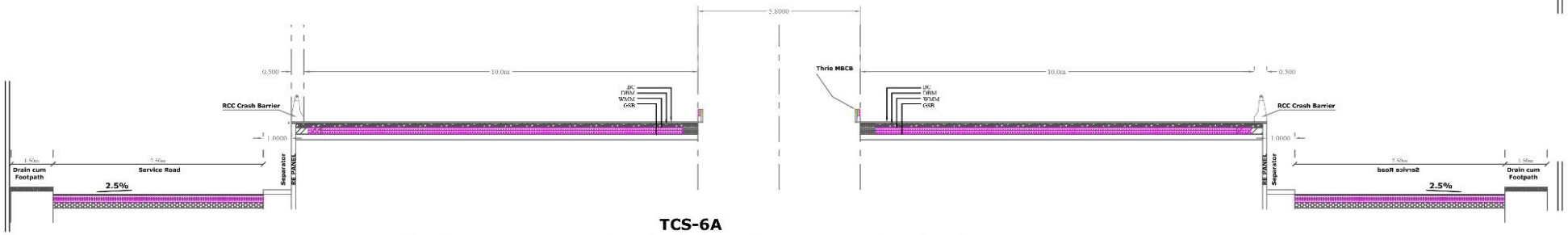
TCS-5A

Fig: 7.8 Cross-Section of Grade Separated Structure in Plain Terrain
Vehicular Underpass and Elevated Section with service road (Approach of Grade Separator)



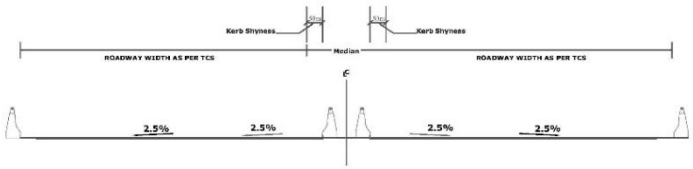
TCS-6

Fig: 7.8 Cross-Section of Grade Separated Structure in Hilly Terrain
Vehicular Underpass and Elevated Section

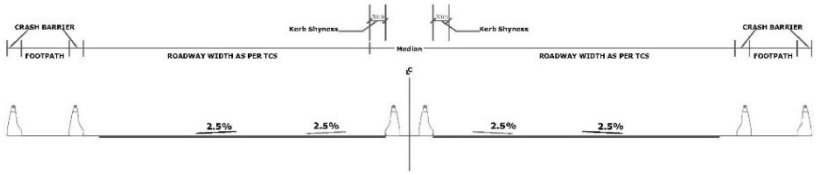


TCS-6A

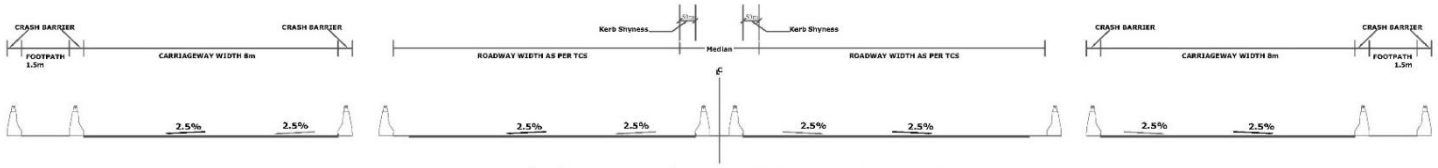
Fig: 7.8 Cross-Section of Grade Separated Structure in Hilly Terrain
Vehicular Underpass and Elevated Section with service road (Approach of Grade Separator)



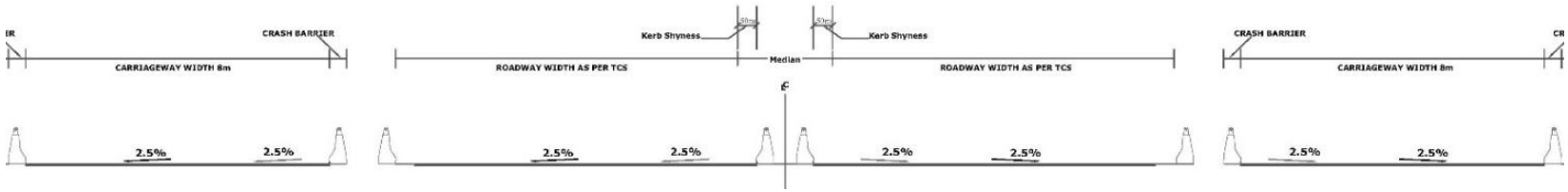
Typical Cross Section OF BOX CULVERT AT ROAD LEVEL
4-LANE DIVIDED HIGHWAY



Typical Cross Section OF BRIDGE AT ROAD LEVEL
4-LANE DIVIDED HIGHWAY WITH FOOTPATH



Typical Cross Section OF BRIDGE AT ROAD LEVEL
4-LANE DIVIDED HIGHWAY WITH SERVICE ROAD & WITHOUT FOOTPATH



Typical cross section of culvert at road level with service road

Schedule – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

1.1. The Contractor shall, at all-time maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.

1.2 The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

1.3. All Materials, works and construction operations shall conform to the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FIFTH REVISION, April 2013)", including latest corrections slips, issued by the Ministry of Surface Transport & Highways, Government of India and published by the Indian Roads Congress.

Where the specifications for a work are not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Repair/rectification of Defects and deficiencies

The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified in Annex-I of this Schedule-E within the time limit set forth therein.

3. Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex-I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4. Extension of time limit

Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof;

5. Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6. Daily inspection by the Contractor

The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Highway and maintain a record thereof in a register to be kept in such form and manner as the Authority's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.

7. Pre-monsoon inspection / post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP:35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

All damages occurring to the Project Highway on account of torrential rains, floods, earthquake or other natural disasters shall be undertaken by the Contractor at its own cost and/or out of the proceeds of insurance.

Annex – I
(Schedule-E)
Repair/rectification of Defects and deficiencies

The Contractor shall repair and rectify the defects and deficiencies specified in this Annex-I of Schedule-E within the time limit set forth in the table below.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC SP 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/ reports/03031/)	24-48 hours	MORT&H Specification 3004.2
S of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15-30 days	MORT&H Specification 3004.2
	Corrugations and	Nil	< 0.1 % of area	Daily	Length Measureme		2-7 days	IRC:82-2015

	Shoving				nt Unit like			

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
S of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Bleeding	Nil	< 1 % area	Daily	Scale, Tape odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	< 1 % area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation / Breaking	Nil	< 1 m for any 100m section and width < 0.1m at any location, restricted to 30cm from the edge	Daily			7-15 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Roughness	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway force Coefficient Routine Investigation Machine or equipment)	Class I Profilometer: ASTM E950 (98): 2004 – Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656-94:2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015
	Deflection /Remaining Life			Annually	Falling Weight Deflectometer	IRC 115:2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTME950(98) :2004 and ASTM E1656-94:2000	180 days	IRC:SP:83-2008

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
Approaches of connecting roads, slip roads, lay byes etc. as applicable)	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC: SP:83-2008	180 days	IRC: SP:83-2008
		Minimum SN	**Traffic Speed (Km/h)**		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					
Embankment / Slopes	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<20% variation in prescribed slope camber / cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15% variation in prescribe	Daily			7-15 days	MORT&H Specification 408.4
Asset Type	**Performa**	**Level of Service (LOS)**		**Freque**	**Tools/Equi**	**Standards and References for**	**Time limit for**	**Maintena**

	nce Parameter	Desirable	Acceptable	ncy of Inspection	pment	Inspection and Data Analysis	Rectification/ Repair	nce Specifications
			Side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

In addition to the above performance criterion, the contractor shall strictly maintain the rigid pavements as per requirements in the following table

Table -2: Maintenance Criteria for Rigid Pavements:

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w< 0. 2mm.hair cracks		
			2	w= 0.2 -0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L >1m. Within 7 days
			3	w= 0.5 -1.5 mm, discernible from fast-moving car		
			4	w= 1.5-3.0 mm	Seal, and stitch if L > 1m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15 days
			5	w > 3 mm		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
2	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No Action	
			1	w< 0. 2mm.hair cracks	Route and seal with epoxy Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	w= 0.2 -0.5 mm, discernible from slow-moving car		
			3	w= 0.5 - 3.0 mm, discernible from fast-moving car	Route and seal and stitch, if L >1m. Within 7 days	
			4	w= 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications – See Para 5.5 &9.2 Within 15 days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	**Single Longitudional Crack intersecting with one or more joints**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No, Action	
			1	w= 0.5 mm, discernible from slow-moving vehicle	Seal with epoxy, if L > 1m. Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	w= 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1m. Within 15 days	-

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			3	w= 3.0 - 6.0 mm	Staple, if L> 1m. Within 15 days	Partial Depth Repair with stapling. Within15 days
			4	w= 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full depth Repair Dismantle and reconstruct affected portion as per norms and specifications See Para 5.6.4 Within 15 days
4	**Multiple Crack intersecting with one or more joints**	w= width of crack	0	Nil, not discernible	No, Action	-
			1	w < 0.2 mm, hair cracks	Seal and stitch if L > 1m. Within 15 days	
			2	w= 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w= 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w= 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and /or panel broken into more than 4 pieces		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
5	**Corner Break**	w= width of crack L= length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5mm, only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7 days
			2	w < 1.5mm, L < 0.6m, only one corner broken		
			3	w < 1.5mm, L < 0.6m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:83-2008) Within 15 days	Full depth repair
			4	w > 1.5mm, L > 0.6m or three corners broken		
			5	Three or four corners broken		Reinstate sub-base and reconstruct the slab as per norms and specifications Within 30 days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w= width of crack L= length (m/m2)	0	Nil, Not discernible		No, Action
			1	w < 0.5 mm, L< 3m / m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts.
			2	either w > 0.5 mm or L < 3m /m^2		
			3	w > 1.5mm and L < 3m /m^2		
			4	w > 3mm, L < 3m /m^2 and deformation		Full depth repair Cutout and replace damaged area taking care not to damage reinforcement.
			5	w > 3mm, L < 3m /m^2 and deformation		

						Within 30 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
7	**Ravelling or Honeycomb type surface**	r= area damaged surface / total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of area damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10 - 25 %	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	r = 25 - 50 %		
			5	r > 50% and h > 25mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
8	**Scalling**	r= damaged surface / total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of area damaged and liable to be damaged. Within 7 days	
			2	r = 2 - 10 %		
			3	r = 10 - 20 %	Bonded Inlay Within 15 days	
			4	r = 20 - 30 %		
			5	r > 30% and h > 25mm	Reconstruct slabs Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
9	**Polished Surface /Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t >1 mm		
			2	t = 1 - 0.6 mm	Monitor rate of deterioration Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm		
10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action	
			1	d = 50 – 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	Not Applicable
			2	d = 50 – 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 – 300 mm; h < 100 mm; n < 1 per 5 m^2	Partial depth repair 110 mm i.e. 10mm more that the depth of the hole. Within 30 days	
			4	d = 10 – 300 mm; h > 100 mm; n < 1 per 5 m^2		
			5	d > 300 mm; h > 100 mm; n > 1 per 5 m^2	Full depth repair. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length			**Short Term**	**Long Term**
			0	Difficult to discern	No action	Not Applicable
			1	Discernible, L < 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25%insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin / mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
			3	w = 20 – 40 mm, L > 25%	Partial Depth Repair. Within 15 days	Not Applicable
			4	w = 40 – 80 mm, L > 25%	30 – 50 mm deep, h = w + 20 % of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 – 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (or Stepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action
			1	f < 3 mm		
			2	f = 3 – 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30 days
			3	f = 6 – 12 mm	Diamond Grinding	
			4	f = 12 – 18 mm	Raise sunken slab	Replace the slab as appropriate. Within 30 days
			5	f > 18 mm	Strengthen subgrade and sub – base by grouting and raising sunken slab	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
14	**Blowup or Buckling**	h = vertical displacement from normal profile	0	Nil, not discernible	**Short Term** No action	**Long Term**
			1	h < 6 mm		
			2	h = 6 – 12 mm	Install Signs to Warn Traffic Within 7 days	
			3	h = 12 – 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slab, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L = length	0	Not discernible, h < 5 mm	No action.	Not applicable
			1	h = 5 – 15 mm		
			2	h = 15 -30 mm, Nos < 20% joints	Install Signs to Warn Traffic Within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20 % joints	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
					Short Term	**Long Term**
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible, h < 5 mm	No action	
			1	h = 5 – 15 mm	Follow up	scrabble
			2	h = 15 – 30 mm, Nos < 20% joints	Install Signs to Warn Traffic Within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
			5	f > 18 mm	Strengthen subgrade and sub – base by grouting and raising sunken slab	
17	**Bump**	h = vertical displacement from normal profile.	0	h < 4 mm	No action	
			1	h = 4 – 7 mm	Grind, in case of new construction Within 7 days	Construction Limit for new Construction
			3	h = 7 – 15 mm	Grind, in case of on going maintenance Within 15 days	Replace in case of new construction. Within 30 days.
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
					Short Term	**Long Term**
18	**Lane to Shoulder Dropoff**	f = difference of level	0	Nil, Not discernible, < 3 mm	No action	
			1	f = 3 – 10 mm	Spot repair of shoulder Within 7 days	
			2	f = 10 – 25 mm		
			3	f = 25 – 50 mm	Fill up shoulder Within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30 days
			4	f = 50 – 75 mm		
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	Appreciable/ Frequent 10- 25%	Lift or jack slab within 30 days	
		Nos/100m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	not discernible problem	No Action	
			3 to 4	Blockage observed in drains, but water flowing	Clean drains etc within 7days follow up	Action required to stop water damaging foundation within 30 days
			5	Ponding, accumulation of water observed	-do-	

Table -3: Maintenance Criteria for Safety Related Items and Other Furniture Items:

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.		Manual Measurements with Odometer	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary		IRC:SP 84-2014

<table>
<tr><td rowspan="4">Highway</td><td rowspan="4">Availability of Safe Sight Distance</td><td>Design Speed, kmph</td><td>Desirable Minimum Sight Distance (m)</td><td>Safe Stopping Sight Distance (m)</td><td rowspan="4">Monthly</td><td rowspan="4">along with video/ image backup</td><td colspan="3" rowspan="4">encroachments.

In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at the earliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be</td><td rowspan="4"></td></tr>
<tr><td>100</td><td>360</td><td>180</td></tr>
<tr><td>80</td><td>260</td><td>130</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td colspan="3"><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2 months</td><td>IRC:35-2015</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Day time Visibility	During expected life Service Time Cement Road - 130mcd/m^2/lux Bituminous Road - 100mcd/m^2/lux	Monthly	As per Annexure-D of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
		Initial and Minimum Performance for Dry Retro reflectivity during night time:		As per Annexure-E	Re - painting	Cat-1 Defect – within 24 hours	IRC:35-2015

<table>
<tr><td></td><td>Night Time Visibility</td><td>Design Speed</td><td colspan="2">(RL) Retro Reflectivity (mcd/m^2/lux)</td><td>Bi-Annually</td><td>of IRC:35-2015</td><td></td><td>Cat-2 Defect – within 2 months</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Initial (7 days)</td><td>Minimum Threshold level (TL) & warranty period required up to 2 years</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>Up to 65</td><td>200</td><td>80</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>65 - 100</td><td>250</td><td>120</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>Above 100</td><td>350</td><td>150</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="3">Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Asset Type</td><td>Performance Parameter</td><td colspan="3">Level of Service (LOS)</td><td>Frequency of Measurement</td><td>Testing Method</td><td>Recommended Remedial measures</td><td>Time limit for Rectification</td><td>Specifications and Standards</td></tr>
<tr><td></td><td></td><td colspan="3">Initial 7 days Retro reflectivity: 100 mcd/m^2/lux
Minimum Threshold Level: 50 mcd/m^2/lux</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012

Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**

	Retro reflectivity	As per specification in IRC:67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with A S T M D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	IRC:67-2012
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance R	Raising Kerb eight	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image K backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2019 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC: SP:84-2019, IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image	Rectification	Within 15 days	IRC: SP:84-2019
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC: SP:84-2019, IRC:119-2015
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**

	End Treatment of	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2019,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as	Daily	Visual with video/image	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2019
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with	Improvement in Lighting System	24 hours	IRC:SP:84-2019
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2019
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2019

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with	Improvement in Lighting System	24 hours	IRC:SP:84-2019
		No major/minor failure in the lighting system	Daily	-	Rectification failure	8 hours	IRC:SP:84-2019
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2019
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes	Within 90 days	IRC:SP:84-2019
	Vegetation affecting sight line and road	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2019

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay- bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15days	IRC:SP 84-2019

Asset Type	Performance Paramet	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectificati	Specification s and Standards
Pipe/Box/ slab culverts	Free waterway/ unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35- 1990 if any, for	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC:SP:40-1993	15 days	IRC SP:40-1993 and MORTH Specifications clause 2800
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not more than 1m aggregate					
			Frequency of		**Recommended**	**Time limit**	**Specification**

Asset Type	Performance Parameter	Level of Service (LOS)	Measurement	Testing Method	Remedial measures	for Rectification	s and Standards
	Protection work in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	IRC: SP 40-1993 and IRC:SP: 13-2004.
Bridges including ROBS Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspections per IRCSP:35-1990	Repairs to BC or wearing coat	15 days	MORTH Specification 2811
Bridge – Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspections per IRCSP:35-1990	Repairs to BC or either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORTH Specification 3004.2 & 2811
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspections and detailed condition survey as per IRC SP:35-1990	Repairs and replacement of safety barriers as the case may be	3 days	IRC: 5-1998 IRC:SP: 84-2009. And IRC SP: 40- 1993

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Rusted reinforcement	Not more than 0.25 sq.m.	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti- corrosive coating before carrying out the repair to affected concrete portion with epoxy mortar / concrete.	15 days	IRC:SP: 40-1993. And MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m.					
	Delamination	Not more than 0.50 sq.m.					
	Cracks wider than 0.30 mm	Not more than 1m total length.	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigation causes for cracks development and carry out necessary rehabilitation.	48 hours	IRC:SP: 40-1993. And MORTH Specification 2800.
	Rain seepage through deck slab	Leakage- nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Grouting with slab at leakage areas, waterproofing, repairs to drainage spouts.	1months	MORTH Specification 2600 & 2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity.	6months	IRC:SP: 51-1999.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz.	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30m.	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTOLRFD Specification
	Leakage in Expansion Joints	No damage to elastomeric sealant compound in strip expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH Specification 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH Specification 2600 and IRC SP: 40-1993.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH Specification 2700
Bridge sub structure	Cracks/spalling of concrete /rusted steel	No cracks spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed.	30 days	IRC:SP: 40-1993. And MORTH Specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge	In case of failure of even one bearing on any pier/ abutment, all the bearings on that pier/ abutment shall be replaced, in order	3 months	MORTH Specification 2810 and IRC SP: 40-199.

		tearing of rubber not more		Inspection Unit	to get uniform load transfer on to bearings.		
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		than 2 locations per side, no rupture of reinforcement or rubber.					
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level form the bridge	Bi-Annually	Condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/ abutment	1 months	IRC: SP: 40-1993. IRC: 83-2014 MORTH Specification 2500.
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m. damage to apron (concrete apron) not	2 times in a year (before and after rainy season)	Condition survey as per IRC SP: 35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	MORTH Specification 2810 and IRC SP: 40-199.

		more than 1 sq.m.					

Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

In addition to above, for hill roads the following provisions for maintenance is also to done.

Hill Roads		
(i)	Damage to Retaining wall /Breast wall	7 (Seven) days
(ii)	Landslides requiring clearance	12 (Twelve) hours
(iii)	Snow requiring clearance	24 (Twenty-Four) hours

Note: For all tables 1 to 5 above, latest BIS & IRC standard (even those not indicated herewith) along with MoRTH specifications shall be binding for all maintenance activities.

A. Flexible Pavement

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(b)	**Granular earth shoulders, sides lopes, drains and culvert**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (Seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (Seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (Thirty) days
(iv)	Rain cuts/gullies in slope	7 (Seven) days
(v)	Damage to or silting of culverts and side drains	7 (Seven) days
(vi)	Desilting of drains in urban/semi-urban areas	24 (Twenty-Four) days
(vii)	Railing, parapets, crash barriers	7(seven) days (Restore immediately if causing safety hazard)

(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 (forty-eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required /Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (Seven) days
(iv)	Damaged to road mark ups	7 (Seven) days
(d)	Road lighting	
(i)	Any major failure of the system	24 (Twenty-Four) days
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (Twenty-Four) days
(ii)	Removal of fallen trees from carriageway	4 (Four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (Twenty-Four) days
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossing,[Traffic Aid Posts, Medical Aid Posts],	15 (fifteen) days

	and service roads	
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a) Superstructure		
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	Within 48 (forty-eight) hours Within 15 (fifteen) days or as specified by the Authority's Engineer
(b) Foundations		

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(i)	Scouring and / or cavitation	15 (fifteen) days
(c) Pipers, abutment, return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joints	15 (fifteen) days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent - holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)

(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damaged to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(iii)	Snow requiring clearance	24 (twenty-four) hours

[**Note:** Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]

Schedule-F

(See Clause 3.1.5(a))

APPLICABLE PERMITS

1. **Applicable Permits**

The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

(a) Permission of the State Government for extraction of boulders from quarry;

(b) Permission of Village Panchayat and Pollution Control Board for installation of crushers;

(c) License for use of explosives;

(d) Permission of the State Government for drawing water from river/reservoir;

(e) License from inspector of factories or other competent Authority for setting up batching plant;

(f) Clearance of Pollution Control Board for setting up batching plant;

(g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;

(h) Permission of Village Panchayats and State Government for borrow earth; and

(i) Any other permits, clearances or approvals required under Applicable Laws.

1.2 Applicable permits, as required, relating to environmental protection and conservation shall have been produced by the Authority in accordance with the provisions of this Agreement

Schedule-G

(See Clause 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

PERFORMANCE SECURITY

The Managing Director,
NHIDCL,
1st and 2nd Floor, Tower A
World Trade Center, Nauroji Nagar
New Delhi-110029

WHEREAS:

(A)_____ [name and address of contractor] (hereinafter called "the Contractor") and [**NHIDCL**], (**"the Authority"**) have entered into an agreement (the **"Agreement"**) for "**Construction of Mawlynkhung to Mawryngkneng to 4-lane with Paved Shoulder configurations in the state of Meghalaya, from design Km 0+000 to Km 20+000 (Shillong Eastern Bypass PKG-1) (Design Length= 20.000 Km) under NH(O)-NE on EPC mode"**, subject to and in accordance with the provisions of the Agreement.

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the Construction Period and Defects Liability Period (as defined in the Agreement) in a sum of Rs. …. Crore (Rupees …. Crore) (the "**Guarantee Amount**").

(C) We, ……. through our branch at ……. (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during Construction Period and Defects Liability Period under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the NHIDCL that the Contractor has committed default in the due and faithful performance

of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfillment and/or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****[$1]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in Para 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operable at our…… Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank), Transport

[$] Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

		Bhawan, 1st Parliament Street, NewDelhi110001

14. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

Signed and sealed this ……. day of ……. 20……. at ……

SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:

(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii)The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex-II
(Schedule-G)
(See Clause 7.5.3)
Form for Guarantee for Withdrawal of Retention Money

The Managing Director,
NHIDCL,
1st and 2nd Floor, Tower A
World Trade Center, Nauroji Nagar
New Delhi-110029

WHEREAS:

[Name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [NHIDCL], (hereinafter called "the Authority") for the **"Construction of Mawlynkhung to Mawryngkneng to 4-lane with Paved Shoulder configurations in the state of Meghalaya, from design Km 0+000 to Km 20+000 (Shillong Eastern Bypass PKG-1) (Design Length= 20.000 Km) under NH(O)-NE on EPC mode."** subject to and in accordance with the provisions of the Agreement.

(A) In accordance with the Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called "**Retention Money**") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

(B) We, ……. through our branch at …….. (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs. ……Cr. (Rs……. in words) (the "**Guarantee Amount"**).

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the NHIDCL that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in para 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operable at our…… Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank), Transport Bhawan, 1st Parliament Street, NewDelhi110001

14. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded

Signed and sealed this ……... day of ……. 20……... at ……

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex-III
(Schedule-G)
(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
NHIDCL,
1st and 2nd Floor, Tower A
World Trade Center, Nauroji Nagar
New Delhi-110029

WHEREAS:

[name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [**NHIDCL**], (hereinafter called "**the Authority**") for the **"Construction of Mawlynkhung to Mawryngkneng to 4-lane with Paved Shoulder configurations in the state of Meghalaya, from design Km 0+000 to Km 20+000 (Shillong Eastern Bypass PKG-1) (Design Length= 20.000 Km) under NH(O)-NE on EPC mode"** subject to and in accordance with the provisions of the Agreement.

(A) In accordance with the Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing (@ Bank Rate) advance payment (hereinafter called "**Advance Payment**") equal to 10% (ten per cent) of the contract price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. ------ cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the **"Guarantee Amount")** [$2]**.**

[$]The Guarantee Amount should be equivalent to 110% of the value of the applicable installment.

(B) We, ……...through our branch at …… (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevoc**ably, guarantee**s and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the NHIDCL, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision

have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The guarantee shall cease to be in force and effect on ****.[$3] Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in Para 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operable at our…… Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	Particulars	Details

[$]Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 19.2 of the Agreement).

1	**Name of Beneficiary**	**National Highways & Infrastructure Development Corporation Limited**
2	**Beneficiary Bank Account No.**	**90621010002659**
3	**Beneficiary Bank Branch**	**IFSC CNRB0019062**
4	**Beneficiary Bank Branch Name**	**Transport Bhawan, New Delhi**
5	**Beneficiary Bank Address**	**Canara Bank (erstwhile Syndicate Bank), Transport Bhawan, 1st Parliament Street, NewDelhi110001**

14. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

Signed and sealed this ……... day of ……. 20…….... at ……

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)
(Address)

Annex-IV

(Schedule - G)

(See Clause 7.1)

Form of Insurance Surety Bond

[Performance Security/Additional Performance Security]

National Highways & Infrastructural Development Corporation Ltd.

1st and 2nd Floor, Tower A
World Trade Center, Nauroji Nagar
New Delhi-110029

WHEREAS:

(A) _____[name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the "********** EPC Mode" subject to and in accordance with the provisions of the Agreement

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and MaintenancePeriod}(asdefinedintheAgreement)inasumofRs…..cr.(Rupees

…….. crore) (the "**Surety Bond Amount**").

(C) We, …….. through our branch at..... (the "**Surety Insurer**") have agreedto

furnish this bank guarantee (*hereinafter called the* **"Surety Bond**") by way of Performance Security.

NOW, THEREFORE, the **Surety Insurer** hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The **Surety Insurer** hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the **Surety Bond** Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of

[General Manager in the National Highways Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance

with the Agreement shall be conclusive, final and binding on the **Surety Insurer**. The **Surety Insurer** further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the **Surety Insurer**, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this **Surety Bond**, the Authority shall be entitled to act as if the **Surety Insurer** were the principal debtor and any change in the constitution of the Contractor and/or the **Surety Insurer**, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the **Surety Insurer** under this **Surety Bond**.

4. It shall not be necessary, and the **Surety Insurer** hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this **Surety Bond**.

5. The Authority shall have the liberty, without affecting in any manner the liability of the **Surety Insurer** under this **Surety Bond**, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the **Surety Insurer** shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the **Surety Insurer** from its liability and obligation under this **Surety Bond** and the **Surety Insurer** hereby waives all of its rights under any such law.

6. This **Surety Bond** is in addition to and not in substitution of any other **Surety Bond** or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the **Surety Insurer** under this **Surety Bond** is restricted to the **Surety Bond** Amount and this **Surety Bond** will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the **Surety Insurer** under this **Surety Bond** all rights of the Authority under this **Surety Bond** shall be forfeited and the Surety Insurer shall be relieved from its liabilities hereunder.

8. The **Surety Bond** shall cease to be in force and effect on ****$. Unless a demand or claim under this **Surety Bond** is made in writing before expiry of the **Surety Bond**, the **Surety Insurer** shall be discharged from its liabilities hereunder.

9. The **Surety Insurer** undertakes not to revoke this **Surety Bond** during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this **Surety Bond** and the undersigned has full powers to do so on behalf of the **Surety Insurer** .

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the **Surety Insurer** at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by

post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This **Surety Bond** shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This **Surety Bond** is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

13. This **Surety Bond** shall also be operatable at our .... Branch at New Delhi, from whom confirmation regarding the issue of this **Surety Bond** or extension / renewal thereof shall be made available on demand. In the contingency of this Surety Bond being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

14. The Insurance Surety Bond shall be verified from the branch concerned/ specific portal created for this purpose.

Signed and sealed this ……. day of ……., 20…… at ……..
SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:
(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

(i) The Surety Bond should contain the name, designation and code number of the officer(s) signing the Surety Bond.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Schedule-H

(See Clauses10.1 (iv) and 19.3)

1.1 The Contract Price for this Agreement is Rs. Cr.

1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specified below

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road works including culverts, widening and repair of culverts.	38.59%	**A - Widening and strengthening of existing road**	
		(1) Earthwork up to top of Embankment	[Nil]
		(2) Subgrade	[Nil]
		(3) Sub base course	[Nil]
		(4) Non bituminous base course	[Nil]
		(5) Bituminous base Course	[Nil]
		(6) Wearing coat	[Nil]
		(7) widening and repair of culverts	[Nil]
		B.1 - Reconstruction/ New 2/4-lane realignment/bypass (Flexible pavement)	
		(1) Earthwork up to top of Embankment	24.32%
		(2) Subgrade	1.28%
		(3) Sub base course	18.72%
		(4) Non bituminous base course	11.40%
		(5) Bituminous base Course	11.38%
		(6) Wearing coat	9.04%
		B.2 - Reconstruction/ New 2/4-lane realignment/bypass (Rigid Pavement)	
		(1) Earthwork up to top of Embankment	[Nil]
		(2) Subgrade	[Nil]
		(3) Subbase course (GSB)	[Nil]
		(4) Dry lean concrete (DLC)	[Nil]
		(5) Pavement quality concrete (PQC) course	[Nil]
		C.1 - Reconstruction/ New Service road (flexible Pavement)	
		(1) Earthwork up to top of Embankment	0.01%
		(2) Subgrade	[Nil]
		(3) Sub base course	5.58%
		(4) Non bituminous base course	3.39%
		(5) Bituminous base Course	[Nil]
		(6) Wearing coat	3.11%
		C.2 - Reconstruction/ New Service road (Rigid Pavement)	
		(1) Earthwork up to top of Embankment	[Nil]
		(2) Subgrade	[Nil]
		(3) Subbase course (GSB)	[Nil]
		(4) Dry lean concrete (DLC)	[Nil]
		(5) Pavement quality concrete (PQC) course	[Nil]
		D. - Reconstruction/ New culverts on existing road and realignments, bypasses	11.77%
		A.1 - Widening and repairs of Minor Bridges (Length>6m and <60m)	
		Minor Bridges	[Nil]
		(1) Foundation: On completion of the foundation work of abutments and piers.	[Nil]

		(2) Sub-structure: On completion of abutments and piers with abutment/pier cap.	[Nil]
		(3) Super-structure: On completion of the super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barrier road sign, & marking, tests on completion etc. completion in all respect	[Nil]
		(4) Approaches: On completion of approaches including wing walls/ Return walls, retaining walls, stone pitching, protection works for floor, Embankment slope, etc. complete in all respect and fit for use.	[Nil]

Item	**Weightage in percentage to the Contract Price**	**Stage for Payment**	**Percentage weightage**
1	**2**	**3**	**4**
Minor Bridges/ Underpasses/ Overpasses	11.92%	**A.2 - New of Minor Bridges (Length>6m and <60m)**	
		(1) Foundation: On completion of the foundation work of abutments and piers.	30.70%
		(2) Sub-structure: On completion of abutments and piers with abutment/pier cap.	11.57%
		(3) Super-structure: On completion of the super structure upto Deck Slab including bearings.	6.14%
		(4) Miscellaneous Work:On completion of wearing coat, expansion joints, crash barrier, railings, Protection work and any remaining work associated to bridge including tests on bridge.	3.30%
		(5) Approaches: On completion of approaches including wing walls/ Return walls, retaining walls, stone pitching, protection works for floor, Embankment slope, etc. complete in all respect and fit for use.	4.53%
		(6) Guide Bunds and River Training works: On completion of Guide Bunds and river training works complete in all respects.	[Nil]
		B.1 - Widening and repairs of Underpasses/Overpasses	
		Underpasses/Overpasses	[Nil]
		B.2 - New Underpasses/Overpasses	
		(1) Foundation: On completion of the foundation work of abutments and piers.	12.35%
		(2) Sub-structure: On completion of abutments and piers with abutment/pier cap.	10.10%
		(3) Super-structure: On completion of the super structure upto Deck Slab including bearings.	13.11%
		(4) Miscellaneous Work:On completion of wearing coat, expansion joints, crash barrier, railings and any remaining work associated to bridge including tests on bridge.	7.06%
		(5) Approaches: On completion of approaches including wing walls/ Return walls, retaining walls/ Reinforced Earth Walls, stone pitching, protection works complete in all respect and fit for use.	1.14%
		A.1 - Widening and repairs of existing major bridges	
		(1) Foundation	
		(i) Pile Foundation	[Nil]
		(ii) Open Foundation	[Nil]
		(2) Sub structure	[Nil]
		(3) Superstructure (including bearing)	[Nil]
		(4) wearing coat (including expansion joint)	[Nil]
		(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]
		(6) wing walls/return walls	[Nil]
		(7) Guide bunds, river training works etc.	[Nil]
		(8) Approaches (including retaining walls, stone pitching and protection works for Floor, Embankment slope etc.)	[Nil]
		A.2 - New Major Bridges	
		(1) Foundation	
		(i) Well Foundation	[Nil]
		(ii) Pile Foundation	3.50%

		(iii) Open Foundation	[Nil]
		(2) Sub structure	1.21%
		(3) Superstructure (including bearing)	3.82%
		(4) Wearing coat including expansion joint.	0.26%
		(5) Miscellaneous Items (like hand rails, crash barriers, road marking etc.	0.36%
		(6) wing walls/return walls.	0.17%
		(7) Guide bunds, river training works etc.	[Nil]
		(8) Approaches (including retaining walls, stone pitching and protection works for Floor, Embankment slope etc.)	[Nil]

Item	**Weightage in percentage to the Contract Price**	**Stage for Payment**	**Percentage weightage**
1	**2**	**3**	**4**
Major Bridge works and ROB/RUB/elevated sections/flyovers including viaducts, if any	21.72%	**B.1 - Widening and Repair of** **(a) ROB** **(b) RUB**	
		(1) Foundation	
		(i) Pile Foundation	[Nil]
		(ii) Open Foundation	[Nil]
		(2) Sub structure	[Nil]
		(3) Superstructure (including bearing)	[Nil]
		(4) wearing coat: (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB - rigid pavement under RUB including drainage facility complete in all respect as specified.	[Nil]
		(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]
		(6) wing walls/return walls	[Nil]
		(7) Approaches (including retaining walls, stone pitching and protection works).	[Nil]
		B.2 - New ROB / RUB	
		(a) ROB	
		(b) RUB	
		(1) Foundation	
		(i) Well Foundation	[Nil]
		(ii) Pile Foundation	[Nil]
		(iii) Open Foundation	[Nil]
		(2) Sub structure	[Nil]
		(3) Superstructure (including bearing)	[Nil]
		(4) wearing coat: (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB - rigid pavement under RUB including drainage facility complete in all respect as specified.	[Nil]
		(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]
		(6) wing walls/return walls	[Nil]
		(7) Approaches (including retaining walls, stone pitching and protection works).	[Nil]
		C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators	
		(1) Foundation	
		(i) Pile Foundation	[Nil]
		(ii) Open Foundation	[Nil]
		(2) Sub structure	[Nil]
		(3) Superstructure (including bearing)	[Nil]
		(4) wearing coat including expansion joint	[Nil]
		(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]
		(6) wing walls/return walls	[Nil]

		(7) Approaches (including retaining walls/ Reinforced earth walls, stone pitching, protection works).	[Nil]
		C.2 - New Elevated section/Flyover/Grade Separators	
		(1) Foundation	[Nil]
		(i) Well Foundation	[Nil]
		(ii) Pile Foundation	41.61%
		(iii) Open Foundation	[Nil]
		(2) Sub structure	18.16%
		(3) Superstructure (including bearing)	21.77%
		(4) wearing coat including expansion joint	2.53%
		(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	1.23%
		(6) wing walls/return walls	2.50%
		(7) Approaches (including retaining walls/ Reinforced earth walls, stone pitching, protection works).	2.88%

Item	**Weightage in percentage to the Contract Price**	**Stage for Payment**	**Percentage weightage**
1	**2**	**3**	**4**
Other works	24.12%	(i) Toll plaza	[Nil]
		(ii) Road side drains	
		a) Drain	6.58%
		b) Cover Slab	1.13%
		(iii) Road signs, markings, km stones, safety devices etc.	2.67%
		(iv) Overhead Gantry Mounted Signs	0.07%
		(v) Project facilities	
		(a) Bus Bay with Bus Shelter	1.01%
		(b) Truck laybyes	0.55%
		(c) Highway Lightening / Electrification	0.61%
		(d) Rest area with Toilet Block	[Nil]
		(e) others to specified (Water Harvesting Structures)	0.06%
		(vi) Road side plantation	0.18%
		(vii) Protection works other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs.	[Nil]
		(a) Retaining Wall	18.18%
		(b) Breast Wall	18.84%
		(c) Toe Wall with pitching	21.62%
		(d) Hydro-seeding& Mulching	0.93%
		(e) Crash Barrier	15.65%
		(viii) RE Wall	9.07%
		(ix) Safety and Traffic Management during construction	[Nil]
		(x) Kerb Stone	0.75%
		(xi) Junction Improvement	2.10%
Electrical utilities and public Health Utilities (Water pipe lines and	3.65%	(i) EHT line / (ii) EHT crossings	[Nil]
		(iii) HT/ LT line / (iv) HT/ LT crossings over ground	94.14%
		(iv) HT/ LT line / (vi) HT/ LT crossings Under ground	[Nil]
		(vii) Water pipeline / (viii) Water pipeline crossings	5.86%
		(ix) Sewage lines / (x) Sewage line crossings	[Nil]

1.1 Procedure of estimating the value of work done.

1.3.1 Road works

Procedure for estimating the value of road work done shall be as follows:

3 **Table1.3.1**

Stage of Payment	Percentage - weightage	Payment Procedure
A - Widening and strengthening of existing road		
(1) Earthwork up to top of Embankment	[Nil]	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length or 500m whichever is less
(2) Subgrade	[Nil]	
(3) Sub base course	[Nil]	
(4) Non bituminous base course	[Nil]	
(5) Bituminous base Course	[Nil]	
(6) Wearing coat	[Nil]	
(7) widening and repair of culverts	[Nil]	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of atleast one culvert. 75% of the cost will be payable on completion of box/ abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.
B.1 - Reconstruction/ New 2/4-lane realignment/bypass (Flexible pavement)		
(1) Earthwork up to top of Embankment	24.32%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(2) Subgrade	1.28%	
(3) Sub base course	18.72%	
(4) Non bituminous base course	11.40%	
(5) Bituminous base Course	11.38%	
(6) Wearing coat	9.04%	
B.2 - Reconstruction/ New 2/4-lane realignment/bypass (Rigid Pavement)		
(1) Earthwork up to top of Embankment	[Nil]	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(2) Subgrade	[Nil]	
(3) Subbase course (GSB)	[Nil]	
(4) Dry lean concrete (DLC)	[Nil]	
(5) Pavement quality concrete (PQC) course	[Nil]	
C.1 - Reconstruction/ New Service road (flexible Pavement)		

(1) Earthwork up to top of Embankment	0.01%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(2) Subgrade	[Nil]	
(3) Sub base course	5.58%	
(4) Non bituminous base course	3.39%	
(5) Bituminous base Course	[Nil]	
(6) Wearing coat	3.11%	
C.2 - Reconstruction/ New Service road (Rigid Pavement)		

(1) Earthwork up to top of Embankment	[Nil]	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(2) Subgrade	[Nil]	
(3) Subbase course (GSB)	[Nil]	
(4) Dry lean concrete (DLC)	[Nil]	
(5) Pavement quality concrete (PQC) course	[Nil]	
D. - Reconstruction/ New culverts on existing road and realignments, bypasses	11.77%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of atleast one culvert. 75% of the cost will be payable on completion of box/ abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.

@. For example, if the total length of bituminous work to be done is 100 km, the cost per km of bituminous work shall be determined as follows: Cost per km = P x weightage for road work x weightage for bituminous work x (1/L)

Where P= Contract Price. And L = Total length in km.

Similarly, the rates per km for other stages shall be worked out accordingly.

Note: The length affected due to law-and-order problems or litigation during execution due to which the Contractor is unable to execute the work, may be deducted from the total project length for

1.3.2 Minor Bridges and Underpasses/Overpasses.

Procedure for estimating the value of Minor Bridge and underpasses/Overpasses shall be as stated in table 1.3.2:

4 Table1.3.2

Stage of Payment	Weightage	Payment Procedure
A.1 - Widening and repairs of Minor Bridges (Length>6m and <60m)		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
Minor Bridges	[Nil]	
(1) Foundation: On completion of the foundation work of abutments and piers.	[Nil]	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e completion of atleast two foundations of each bridge. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
(2) Sub-structure: On completion of abutments and piers with abutment/pier cap.	[Nil]	(ii) Sub - structure – Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub-structure upto abutment/ pier cap level of each bridge.

(3) Super-structure: On completion of the super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barrier road sign, & marking, tests on completion etc. completion in all respect	[Nil]	(iii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(4) Approaches: On completion of approaches including wing walls/ Return walls, retaining walls, stone pitching, protection works for floor, Embankment slope, etc. complete in all respect and fit for use.	[Nil]	(iv) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of “Stage of Payment” in this sub-clause for each bridge.
A.2 - New of Minor Bridges (Length>6m and <60m)		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(1) Foundation: On completion of the foundation work of abutments and piers.	30.70%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage completion of atleast two foundations of each bridge. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.

(2) Sub-structure: On completion of abutments and piers with abutment/pier cap.	11.57%	(ii) Sub - structure – Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub-structure upto abutment/ pier cap level of each bridge.
(3) Super-structure: On completion of the super structure upto Deck Slab including bearings.	6.14%	(iii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure of at least one span upto deck slab including bearing as specified in the column of "Stage of Payment" in this sub-clause. If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) Miscellaneous Work:On completion of wearing coat, expansion joints, crash barrier, railings, Protection work and any remaining work associated to bridge including tests on bridge.	3.30%	(iv) Miscellaneous Works: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of wearing coat, expansion joint, crash barrier, railing, protection works, drainage and any other remaining work associated to bridge including tests on bridge for each bridge
(5) Approaches: On completion of approaches including wing walls/ Return walls, retaining walls, stone pitching, protection works for floor, Embankment slope, etc. complete in all respect and fit for use.	4.53%	(v) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of “Stage of Payment” in this sub-clause for each bridge.
(6) Guide Bunds and River Training works: On completion of Guide Bunds and river training works complete in all respects.	[Nil]	(vi) Guide Bunds and River Training Works: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works in all respects as specified for each bridge.
B.1 - Widening and repairs of Underpasses/Overpasses		
Underpasses/Overpasses	[Nil]	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpasses/overpasses. Payment shall be made on the completion of widening & repair works of a underpass/overpass.
B.2 - New Underpasses/Overpasses		Cost of each Underpass/Overpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpasses/Overpasses.
(1) Foundation: On completion of the foundation work of abutments and piers.	12.35%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of foundation(s) of each underpass/overpass. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
(2) Sub-structure: On completion of abutments and piers with abutment/pier cap.	10.10%	(ii) Sub-structure: Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub-structure upto abutment/ pier cap level of each bridge.

(3) Super-structure: On completion of the super structure upto Deck Slab including bearings.	13.11%	(iii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage 'i.e. completion of super-structure of at least one span upto deck slab including bearing as specified in the column of "Stage of Payment" in this sub-clause: If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) Miscellaneous Work:On completion of wearing coat, expansion joints, crash barrier, railings and any remaining work associated to bridge including tests on bridge.	7.06%	(iv) Miscellaneous Works: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of wearing coat, expansion joint, crash barrier, railing, protection works and any other remaining work associated to bridge including tests on bridge for each bridge.
(5) Approaches: On completion of approaches including wing walls/ Return walls, retaining walls/ Reinforced Earth Walls, stone pitching, protection works complete in all respect and fit for use	1.14%	(v) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing wall/ return wall, retaining walls, Reinforced Earth walls, stone pitching, protection works complete in all respect for each bridge

1.3.3 Major Bridge works, ROB/RUB and Structures

Procedure for estimating the value of major Bridge works, ROB/RUB and structure work shall be as stated in table 1.3.3

Table 1.3.3

Stage of payment	Weightage	Payment procedure
A.1 - Widening and repairs of existing major bridges		Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the
(1) Foundation		(1) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the major Bridge as specified hereinunder.
(i) Pile Foundation (a) Piling – On completion of pile upto bottom of pile cap (b) Pile Cap : On completion of pile cap	[Nil]	(i) Pile Foundation (a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorate basis. (b) Pile Cap : Payment of 30% on pro-rata basis shall be made on completion of pile cap. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Open Foundation	[Nil]	(ii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub structure	[Nil]	(2) Sub-Structure:. Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure of abutments/piers upto abutment/pier cap level of each of the major bridge.
(3) Superstructure (including bearing)	[Nil]	(3) Super-structure: Payment shall be made on prorata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under : If pre-cast RCC/PSC/Steel girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on
(4) wearing coat (including expansion joint)	[Nil]	(4) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each major bridge.
(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each major bridge.

(6) wing walls/return walls	[Nil]	(6) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each major bridge.
(7) Guide bunds, river training works etc.	[Nil]	(7) Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified for each major bridge.
(8) Approaches (including retaining walls, stone pitching and protection works for Floor, Embankment slope etc.)	[Nil]	(8) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified for each major bridge.
A.2 - New Major Bridges		Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge.

(1) Foundation		(1) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the major Bridge as specified here in under:
(i) Well Foundation (a) On completion of Cutting Edge + Well Curb (b) Wellsteining : On completion of well steining upto bottom of well cap. (c) On completion of bottom plug + top plug (if provisioned as per design) + well cap	[Nil]	(i) Well Foundation (a) Cutting Edge + Well Curb: Payment of 10% shall be made on completion of a stage i.e. completion of cutting edge + well curb. (b) Well steining : Payment of 65% shall be made on completion of well steining upto bottom of well cap. The payment stage shall be further sub-divided on pro-rata basis i.e. (i) on completion upto 10 m and (ii) on completion of each subsequent 5 m or part thereof. (c) Bottom plug + top plug (if provisioned as per design) + well cap: Payment of 25% shall be made on completion of a stage i.e. completion of bottom plug, back fill, top plug and well cap.
(i) Pile Foundation (a) Piling – On completion of pile upto bottom of pile cap (b) Pile Cap : On completion of pile cap	3.50%	(ii) Pile Foundation (a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorota basis. (b) Pile Cap : Payment of 30% shall be made on completion of pile cap. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(iii) Open Foundation	[Nil]	(iii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub structure	1.21%	(ii) Sub-Structure:. Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure of abutments/piers upto abutment/pier cap level of each of the major bridge.

(3) Superstructure (including bearing)	3.82%	(3) Super-structure: Payment shall be made on prorata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under: If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon. (For cable stayed bridge and suspension cable bridge, detailed payment stage may be included on case to case basis)
(4) Wearing coat including expansion joint.	0.26%	(4) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each major bridge.
(5) Miscellaneous Items (like hand rails, crash barriers, road marking etc.	0.36%	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each major bridge.
(6) wing walls/return walls.	0.17%	(6) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each major bridge.
(7) Guide bunds, river training works etc.	[Nil]	(7) Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified for each major bridge.
(8) Approaches (including retaining walls, stone pitching and protection works for Floor, Embankment slope etc.)	[Nil]	(8) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified for each major bridge.
B.1 - Widening and Repair of (a) ROB (b) RUB		Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs.
(1) Foundation		(1) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the ROB/RUB as specified here in under.
(i) Pile Foundation (a) Piling – On completion of pile upto bottom of pile cap (b) Pile Cap : On completion of pile cap	[Nil]	(i) Pile Foundation (a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorata basis. (b) Pile Cap : Payment of 30% on pro-rata basis shall be made on completion of pile cap. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Open Foundation	[Nil]	(ii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.

(2) Sub structure	[Nil]	(2) Sub-Structure:. Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure of abutments/piers upto abutment/pier cap level of each of the ROB/RUB.
(3) Superstructure (including bearing)	[Nil]	(3) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under : If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date
(4) wearing coat: (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB - rigid pavement under RUB including drainage facility complete in all respect as specified.	[Nil]	(4) Wearing Coat: Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified for each of the ROB and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified for each of the RUB.
(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the ROB/ RUB.
(6) wing walls/return walls	[Nil]	(6) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the ROB/ RUB.
(7) Approaches (including retaining walls, stone pitching and protection works).	[Nil]	(7) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified for each of the ROB/ RUB.
B.2 - New ROB / RUB		Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs.
(a) ROB		
(b) RUB		
(1) Foundation		(1) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the ROB/RUB as specified here in under:
(i) Well Foundation (a) On completion of Cutting Edge + Well Curb (b) Wellsteining : On completion of well steining upto bottom of well cap. (c) On completion of bottom plug + top plug (if provisioned as per design) + well cap	[Nil]	(i) Well Foundation (a) Cutting Edge + Well Curb: Payment of 10% shall be made on completion of a stage i.e. completion of cutting edge + well curb. (b) Well steining : Payment of 65% shall be made on completion of well steining upto bottom of well cap. The payment stage shall be further sub-divided on pro-rata basis i.e. (i) on completion upto 10 m and (ii) on completion of each subsequent 5 m or part thereof. (c) Bottom plug + top plug (if provisioned as per design) + well cap: Payment of 25% shall be made on completion of a stage i.e. completion of bottom plug, back fill, top plug and well cap.

(i) Pile Foundation (a) Piling – On completion of pile upto bottom of pile cap (b) Pile Cap : On completion of pile cap	[Nil]	(ii) Pile Foundation (a) Piling : Payment of 70% shall be made on completion of piling uptobottom of pile cap for each pile on prorota basis. (b) Pile Cap : Payment of 30% shall be made on completion of pile cap. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(iii) Open Foundation	[Nil]	(iii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub structure	[Nil]	(2) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure of abutments/piers upto abutment/pier cap level of each of the ROB/RUB.
(3) Superstructure (including bearing)	[Nil]	(3) Super-structure: Payment shall be made on prorata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under : If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book. Applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) wearing coat: (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB - rigid pavement under RUB including drainage facility complete in all respect as specified.	[Nil]	(4) Wearing Coat: Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified for each of the ROB and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified for each of the RUB.
(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the
(6) wing walls/return walls	[Nil]	(6) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the ROB/RUB.
(7) Approaches (including retaining walls, stone pitching and protection works).	[Nil]	(7) Approaches: Payments shall be made on completion of both approaches of each ROB including stone pitching, protection works, etc. complete in all respects as specified here in under : If reinforced soil wall is used with facia panel/blocks, interim payment shall be made @75% of the Cost of that element as derived from MoRTH data Book. Applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators		Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures.

(1) Foundation		(1) Foundation : Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the structure as specified here in under :
(i) Pile Foundation (a) Piling – On completion of pile upto bottom of pile cap (b) Pile Cap : On completion of pile cap	[Nil]	(i) Pile Foundation (a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorate basis. (b) Pile Cap : Payment of 30% on pro- rata basis shall be made on completion of pile cap. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Open Foundation	[Nil]	(ii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub structure	[Nil]	(2) Sub-Structure:. Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure of abutments/piers upto abutment/pier cap level of each of the structure.
(3) Superstructure (including bearing)	[Nil]	(3) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure upto deck slab including bearings of at least one span as specified here in under : If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) wearing coat including expansion joint	[Nil]	(4) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each of the structure.
(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	[Nil]	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the structure
(6) wing walls/return walls	[Nil]	(6) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the structure.
(7) Approaches (including retaining walls/ Reinforced earth walls, stone pitching, protection works).	[Nil]	(7) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects of each structure.
C.2 - New Elevated section/Flyover/Grade Separators		Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures.
(1) Foundation	[Nil]	(1) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the structure as specified here in under :

(i) Well Foundation (a) On completion of Cutting Edge + Well Curb (b) Wellsteining : On completion of well steining upto bottom of well cap. (c) On completion of bottom plug + top plug (if provisioned as per design) + well cap	[Nil]	(i) Well Foundation (a) Cutting Edge + Well Curb: Payment of 10% shall be made on completion of a stage i.e. completion of cutting edge + well curb. (b) Well steining : Payment of 65% shall be made on completion of well steining upto bottom of well cap. The payment stage shall be further sub-divided on pro-rata basis i.e. (i) on completion upto 10 m and (ii) on completion of each subsequent 5 m or part thereof. (c) Bottom plug + top plug (if provisioned as per design) + well cap: Payment of 25% shall be made on completion of a stage i.e. completion of bottom plug, back fill, top plug and well cap.
(i) Pile Foundation (a) Piling – On completion of pile upto bottom of pile cap (b) Pile Cap : On completion of pile cap	41.61%	(ii) Pile Foundation (a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on pro-rata basis. (b) Pile Cap : Payment of 30% shall be made on completion of pile cap. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(iii) Open Foundation	[Nil]	(iii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub structure	18.16%	(2) Sub-Structure:. Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure of abutments/piers upto abutment/pier cap level of each of the structure.
(3) Superstructure (including bearing)	21.77%	(3) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure upto deck slab including bearings of at least one span as specified here in under: If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) wearing coat including expansion joint	2.53%	(4) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each of the structure.
(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	1.23%	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the structure.
(6) wing walls/return walls	2.50%	(6) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the structure.

(7) Approaches (including retaining walls/ Reinforced earth walls, stone pitching, protection works).	2.88%	(7) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified here in under : If reinforced soil wall is used with facia panel/blocks, interim payment shall be made @75% of the Cost of that element as derived from MoRTH data Book. Applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.

1.3.4 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.4:

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
(i) Toll plaza	[Nil]	Unit of measurement is each completed toll plaza. Payment for each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas as specified here in under :
(a) DLC(LHS)		(a) DLC (LHS) : Payment of 12.5% on pro-rata basis shall be made on completion of a stage i.e. completion of DLC on LHS.
(b) DLC (RHS)		(b) DLC (RHS) : Payment of 12.5% on pro-rata basis shall be made on completion of a stage i.e. completion of DLC on LHS.
(c) PQC(LHS)		(c) PQC(LHS): Payment of 25% on pro-rata basis shall be made on completion of a stage i.e. completion of PQC on LHS.
(d) PQC(RHS)		(d) PQC(RHS): Payment of 25% on pro-rata basis shall be made on completion of a stage i.e. completion of PQC on RHS.
(e) Admin Building		(e) Admin Building: Payment of 10% on pro-rata basis shall be made on completion of a stage i.e. completion of Admin Building and miscellaneous works.
(f) Toll Booth, canopy, safety items and all other associated works		(f) Toll Booth, canopy, safety items and all other associated works: Payment of 15% on pro-rata basis shall be made on completion of a stage i.e. completion of Toll Booth, canopy, safety items and all other associated works.
(ii) Road side drains		
a) Drain	6.58%	a) Drains: Unit of measurement is linear length in metre . Payment shall be made on pro rata basis on completion of a stage in a length of not less than 100 m on one side.
b) Cover Slab	1.13%	(b) Cover slabs: Unit of measurement is linear length in metre. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 100 m on one side.

(iii) Road signs, markings, km stones, safety devices etc.	2.67%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than one Km on both sides.
(iv) Overhead Gantry Mounted Signs	0.07%	Unit of measurement is each number. Payment shall be made on pro-rata basis on completion of each overhead gantry mounted sign
(v) Project facilities		Unit of measurement is each number. Payment shall be made on pro rata basis for completed facilities.
(a) Bus Bay with Bus Shelter	1.01%	
(b) Truck laybyes	0.55%	
(c) Highway Lightening / Electrification	0.61%	
(d) Rest area with Toilet Block	[Nil]	
(e) others to specified (Water Harvesting Structures)	0.06%	
(vi) Road side plantation	0.18%	Unit of measurement is linear length in Km. Payment shall be made on pro rata basis on completion of one Km.
(vii) Protection works other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs	[Nil]	Unit of measurement is linear length. Payment against items (a), (b) & (c) shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length and 100 m whichever is less.
(a) Retaining Wall	18.18%	
(b) Breast Wall	18.84%	
(c) Toe Wall with pitching	21.62%	
(d) Hydro-seeding& Mulching	0.93%	
(e) Crash Barrier	15.65%	
(viii) RE Wall	9.07%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length.
(ix) Safety and Traffic Management during construction	[Nil]	Payment shall be made on prorata basis every six months.
(x) Kerb Stone	0.75%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length.
(xi) Junction Improvement	2.10%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length.

1.3.5 Electrical utilities and public Health Utilities (Water pipelines and sewage lines) Procedure for estimating the value of other works done shall be as stated in table 1.3.5:

Table 1.3.5

Stage of Payment	Weightage	Payment Procedure
(i) EHT line		Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i)Erection of Poles-20%, (ii) Conductor stringing including laying of cable- 30%, (iii) DTR erection (if involved)-15% and
(ii) EHT crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 4.
(iii) HT/ LT line		Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of LT/ HT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting
(including transformers if any)	94.14%	(i) Erection of Poles-20% (ii) Conductor stringing including laying of cable- 30%, (iii) DTR erection (if involved)- 10% and (iv) Charging of line including dismantling and site clearance-40% (with DTR) and 50% without DTR)
(iv) HT/ LT crossings/ Under Ground Cable Crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to completion of minimum of 1 crossings.
(v) Water pipeline	5.86%	Unit of measurements as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and
(vi) water pipeline crossings & other Items as per Schedule B		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.

(vii) Sewage lines		Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
(viii) Sewage line crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for completed activity. (The average weightage of major activities in shifting work is laying pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)

Procedure for payment for Maintenance.

2.1 The cost for maintenance shall be as stated in Clause 14.1. (i)

2.2 Payment for Maintenance shall be made in quarterly instalments in accordance with the provisions of Clause 19.7.

Schedule - I

(See Clause 10.2 (iv))

1. Drawings

Drawings In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

2. Additional Drawings: -

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this Schedule-I.

Annex – I

(Schedule - I)

List of Drawings

1. A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:

(a) Drawing of horizontal alignment, vertical profile and detailed cross sections;

(b) Drawings of cross drainage works, i.e. Bridges/Culverts/Flyovers and Other Structures;

(c) Drawings for River Training works;

(d) Drawings of interchanges, major intersections and underpasses;

(e) Drawing of control centre;

(f) Drawings of road furniture items including traffic signage, marking, safety barriers, etc;

(g) Drawings of traffic diversions plans and traffic control measures;

(h) Drawings of road drainage measures;

(i) Drawings of typical details slope protection measures;

(j) Drawings of landscaping and horticulture;

(k) Drawings of pedestrian crossing;

(l) Drawings of street lighting;

(m) General Arrangement showing Base Camp and Administrative Block;

(n) Any other drawings as per instruction of Authority Engineer.

Schedule-J

(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

1. Project Completion Schedule

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule J for each of the Project Milestones and the **Scheduled Completion Date.** Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. Project Milestone-I[$]

(i) Project Milestone-I shall occur on the date falling on the 384th (Three hundred Eighty Four) day from the Appointed Date (the "**Project Milestone-I**").

(ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

3. Project Milestone-II[$]

(i) Project Milestone-II shall occur on the date falling on the 657th (Six hundred fifty seven) day from the Appointed Date (the "**Project Milestone-II**").

(ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount

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[$] If total project length is say **'L' km** and the unencumbered length along existing road as handed over on the appointed date is **'L_1' km** (including bypasses, re-alignment, structure etc.) and balance length i.e. **'L2' km (L-L1)** is to be handed over on a later date as per the memorandum signed under provision of Clause 8.2.1 of the Contract Document, then the Project Milestone-I, II and III shall be linked to stage payment statement for amount in percentage of the contract price worked out on prorata basis for the **'L_1' km** length handed over of balance length, the subsequent Project Milestone shall be linked to stage payment statement for amount in percentage of the total contract price.

For example:

If the date for Milestone-I and Milestone-II is 438th and 621st day from appointed date and balance **'L_2' km** length is handed over after 621st day from appointed date, then the stage payment statement required for achieving Milestone-I and Milestone-II should be linked to Contract Price worked out on prorata basis for the **L_1 km length** [**i.e. for Contract Price x L_1/L**]. Subsequent Milestone i.e. Milestone-III will be linked to stage payment statement for amount in percentage of the total contract price. **In no case, there shall be any change in the schedule completion date unless extension of time has been granted by the Authority under Clause 10.3 and 10.5 of the contract agreement.**

In order for the above dispensation to come into operation, it is necessary that a suitable mechanism (like escrow account) is evolved between the parties to the effect that the payments released to the contractor under the above dispensation would be used for completion of the project in the first instance and shall be available to the Contractor only after meeting his project related commitments.

not less than 40% (thirty per cent) of the Contract Price and **should have started have started with the construction of all bridges .**

4. Project Milestone-III[$]

(i) Project Milestone-III shall occur on the date falling on the 930th (Nine hundred Thirty) day from the Appointed Date (the "**Project Milestone-III**").

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 80% (sixty per cent) of the Contract Price and should have started construction of all project facilities.

5 Schedule Completion Date

(i) The Scheduled Completion Date shall occur on the 1095th (One thousand ninety five) day from the Appointed Date.

(ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 Extension of time

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

Schedule-K

(See Clause 12.1.2)

Tests on Completion

1. Schedule for Tests

1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

1.2 The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule K.

2 Tests

2.1 Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include all the tests specified in IRC code, manual and MORTH specifications for the road and Bridge works, 5th revision, 2013.

2.2 Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometer.

2.3 Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) meters or more shall also be subjected to load testing.

2.4 Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards.

2.5 Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.6 Safety Audit: The Authority's Engineer shall carry out or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

4. **Completion Certificate**

Upon successful completion of Tests, the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

Schedule-L

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ……. (the "**Agreement**"), for construction of the **"Four lanning of Mungiakami - Champaknagar section (NH-08) starting at km 421+850 (design chainage) and ending at km 447+300 (design chainage) (Length-25.450 km) in the State of Tripura on Engineering, procurement & construction (EPC) mode"** through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

1. Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Highway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.

2. In view of the foregoing, I am satisfied that that Project Highway from km 8.000 to km 65.000 can be safety and reliably placed in service of the users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into operation on this the …day of……. 20 ……

ACCEPTED, SIGNED, SEALED	SIGNED,
SEALED AND	
AND DELIVERED	
DELIVERED	
For and on behalf of	For and on behalf of
CONTRACTOR by	AUTHORITY's
ENGINEER by:	
(Signature)	(Signature)

Schedule-L
COMPLETION CERTIFICATE

1. I, …….(Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated …….(the "**Agreement**"), for construction of the **"Four lanning of Mungiakami - Champaknagar section (NH-08) starting at km 421+850 (design chainage) and ending at km 447+300 (design chainage) (Length-25.450 km) in the State of Tripura on Engineering, procurement & construction (EPC) mode"** through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safety and reliably placed in service of the Users thereof.

2. It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the…….day of…… 20…….

SIGNED, SEALED AND DELIVERED

For and on behalf of

The Authority's Engineer by:
(Signature)
(Name)
(Designation)
(Address)

Schedule-M

(See Clauses 14.6., 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

1. Payment reduction for non-compliance with the Maintenance Requirements

1.1 Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.

1.2 Any deduction made on account of non-compliance with the maintenance Requirements shall not be paid even after compliance subsequently. The deduction shall continue to be made every month until compliance is done.

1.3 The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage reductions in lump sum payments

2.1 The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	

(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

2.2 The amount to be deducted from monthly lump-sum payment for non-compliance of particular item shall be calculated as under:

R=P/100 x M xL1/L

Where: P = Percentage of particular item//Defect/deficiency for deduction

M = Monthly lump-sum payment in accordance with the Bid

L1 = non-complying length

L = Total length of the road,

R = Reduction (the amount to be deducted for noncompliance for a particular item/Defect/deficiency)

The total amount of reduction shall be arrived at by summation of reductions for such items/Defects/deficiency or non-compliance.

For any Defect in a part of one kilometer, the non-conforming length shall be taken as one kilometer.

Schedule-N

(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

1.1 The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof or 'Guidelines for Employment of Consultants under Japanese ODA Loans' or a combination of certain provisions thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

1.2 The Authority shall invite Expression of Interest from Consulting Engineering firms or bodies corporate to undertake and perform the duties and functions set forth in Annexure-I of Schedule-N and thereupon shortlist qualified firms in accordance with pre-determined criteria.

1.3 The Authority shall invite the aforesaid shortlisted firms to submit their respective technical and financial offers, each in separate sealed cover and/or upload online. All the technical bids so received shall be opened and pursuant to the evaluation thereof, the Authority shall open the financial bids in respect of each shortlisted firm and the order of priority as among these firms shall be determined on the basis of a weighted evaluation where technical and financial score shall be assigned respective weights of 80:20.

1.4 In the event of termination of the Technical Consultants appointed in accordance with the provisions of above Paragraphs 1.1 to 1.3, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2 Terms of Reference

The Terms of Reference for the Authority's Engineer (the "**TOR**") shall substantially conform with Annex 1 to this Schedule N.

3 Appointment of Government entity as Authority's Engineer

Notwithstanding anything to the contrary contained in this Schedule, the Authority may in its discretion appoint a government-owned entity as the Authority's Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting, advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority's Engineer.

Annex – I

(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1. Scope

1.1 These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated..... (the "**Agreement**), which has been entered into between the Ministry of Road Transport and Highways (the "**Authority**") and ..... (the "**Contractor**") for **"Four lanning of Mungiakami - Champaknagar section (NH-08) starting at km 421+850 (design chainage) and ending at km 447+300 (design chainage) (Length-25.450 km) in the State of Tripura on Engineering, procurement & construction (EPC) mode"** and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

1.2 The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

2.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.

2.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

2.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, *mutatis mutandis*, to this TOR.

3. General

3.1 The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

3.2 The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:

(a) any Time extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment; or

(d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding 0.2% of Contract Price.

3.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

3.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

3.5 The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

3.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4 **Construction Period**

4.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

4.2 The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

4.3 The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.

4.4 The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

4.5 The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

4.6 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

4.7 The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

4.8 The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

4.9 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

4.10 The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

4.11 The timing of tests referred to in Paragraph 4.9, and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

4.12 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

4.13 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.

4.14 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

4.15 The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

4.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

4.18 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

5.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

5.2 The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

5.3 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that

the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

5.4 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule- E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

5.5 The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6 Determination of costs and time

6.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

6.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

6.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

7. Payments

7.1 The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

7.2 Authority's Engineer shall -

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

7.3 The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

7.4 The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

9 Miscellaneous

9.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

9.2 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.

9.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

9.4 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

9.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

SCHEDULE - O

(See Clauses 19.4.1, 19.6.1, and 19.8.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) The estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;

(b) Amounts reflecting adjustments in price for the aforesaid claim;

(c) The estimated amount of each Change of Scope Order executed subsequent to the last claim;

(d) Amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);

(e) Total of (a), (b), (c) and (d) above;

(f) Deductions:

(i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;

(ii) Any amount towards deduction of taxes; and

(iii) Total of (i) and (ii) above.

(g) Net claim: (e) – (f) (iii);

(h) The amounts received by the Contractor upto the last claim:

(i) For the Works executed (excluding Change of Scope orders);

(ii) For Change of Scope Orders, and

(iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(a) the monthly payment admissible in accordance with the provisions of the agreement;

(b) the deductions for maintenance work not done;

(c) net payment for maintenance due, (a) minus (b);

(d) amounts reflecting adjustments in price under Clause 19.12; and

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(f) the monthly payment admissible in accordance with the provisions of the agreement;

(g) the deductions for maintenance work not done;

(h) net payment for maintenance due, (a) minus (b);

(i) amounts reflecting adjustments in price under Clause 19.12; and

(j) amount towards deduction of taxes

4. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

Schedule-P

(See Clause 20.1)

INSURANCE

1. Insurance during Construction Period

1.1 The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the last Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

1.2 The insurance under paragraph 1.1 (a) and (b) above shall cover the authority and the Contractor against all loss or damage from whatsoever cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and arises from a cause occurring prior to the issue of Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1. The Contractor shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences. The insurance cover shall be not less than: Rs. [*****]

3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

(a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

(b) Damage which is and unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

SCHEDULE-Q
(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality test:

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be 2,500 (two thousand five hundred) mm for each kilometer.

2. Visual and physical test:

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include measurement of cracking, rutting, stripping and potholes and the permissible values are given below: • Area of cracking not more than 2 % area

- Area of rutting with rut depth more than 10 mm - not more than 1 …. % area
- Area of stripping: not more than 2 % area
- Area of potholes: Nil
- Edge drop – Shall not be more than 15 mm

SCHEDULE-R

(See Clause 14.10)

Taking Over Certificate

I, ……. (Name and designation of the Authority's representative) under and in accordance with the Agreement dated …… (the "Agreement"), for **"Four lanning of Mungiakami - Champaknagar section (NH-08) starting at km 421+850 (design chainage) and ending at km 447+300 (design chainage) (Length-25.450 km) in the State of Tripura on Engineering, procurement & construction (EPC) mode"** ……. (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has Taken over the Project Highway from the Contractor on this day .....

SIGNED, SEALED AND DELIVERED

(Signature)
(Name of Authority's Engineer)
(Address)

SCHEDULE-S

(See Clause 17.7.2)

Performance Certificate

I, ……. (Name and designation of the Authority's representative) under and in accordance with the Agreement dated …… (the "Agreement"), for [construction and maintenance of the **"Four lanning of Mungiakami - Champaknagar section (NH-08) starting at km 421+850 (design chainage) and ending at km 447+300 (design chainage) (Length-25.450 km) in the State of Tripura on Engineering, procurement & construction (EPC) mode"** ……. (Name of Contractor), hereby certify that the Contractor has discharged all its obligations under the Agreement and in accordance with Article 17 of the Agreement I hereby issue Performance Certificate to the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name of Authority's Engineer)

(Address)

SCHEDULE-T
(See Clause 19.1.6)

Name of Currency	**A Amount of Currency**	**B Rate of Exchange* (Local Currency per Unit of Foreign Currency)**	**C Local Currency Equivalent**	**D Percentage of Net Bid Price (NTP) (100 x C) / NTP**
Local Currency (Indian Rupees)				
Foreign Currency 1 (Japanese Yen)				
Foreign Currency 2 (US Dollar)				
Net Bid Price				100.00

* The fixed rates of exchange shall be the selling rates 28 days prior to the deadline for submission of bids published by the **Reserve Bank of India**.

1. Change in scope would require agreement between parties on currency.
2. Regarding damages by the Authority, financing charges for a payment delay will be in corresponding currency amounts.
3. Delay damages will be recovered in currencies in proportion which in which contract price is payable.