राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड
सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार
तीसरी मंजिल, पीटीआई बिल्डिंग, 4–संसद मार्ग, नई दिल्ली–110001

National Highways & Infrastructure Development Corporation Limited
Ministry of Road Transport & Highways, Govt. of India
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आज़ादी का अमृत महोत्सव

BUILDING INFRASTRUCTURE - BUILDING THE NATION
CIN: U45400DL2014GOI269062

(भारत सरकार का उद्यम) (A Government of India Enterprise)

NHIDCL/Manipur/Imp-Koh(NH-39)/Pkg-4B/2020/185566/3178 Dated:06.10.2022

To,

All Prospective Bidders

Name of Work: Improvement/ Up-gradation of existing 2-Lane Road to 4-Lane Divided Highway from Daili to Kuraopokpi section (Pkg-4B) of Imphal-Kohima Road (NH-39) (Design Chainage from Km 274+610 to Km 287+000) in the state of Manipur on EPC Mode.

Tender Id: 2022_NHIDC_707797_1

Corrigendum No-1

S. No	Reference to Clause	As per instant RFP		Modified Clause proposed	
1	Section 7(Data Sheet), bidding Schedule of RFP	**BID Due Date**	06.10.2022 up to 1100 hrs]	**BID Due Date**	20.10.2022 up to 1100 hrs]
		Physical Submission of Bid Documents/POA etc.	[Upto 11:00 hrs IST on the date of technical opening	**Physical Submission of Bid Documents/POA etc.**	[Upto 11:00 hrs IST on the date of technical opening
		Opening of Technical BIDs at venue 2.11.4 (i)	07.10.2022 up to 1130 hrs]	**Opening of Technical BIDs at venue 2.11.4 (i)**	21.10.2022 up to 1130 hrs]
2	**Schedules**	-		Technical Schedules (Attached as Annexure-A)	
3	2.2.2.2(i) of RFP	15(five) years in case of normal highway projects and 10(Ten) years in case of stand alone specified projects (Major) Bridges/ROB/Flyover/Tunnel)		15(five) years in case of normal highway projects and 10(Ten) years in case of stand along specialized projects (Major) Bridges/ROB/Flyover/Tunnel)	
4	Para 5 of table under 2.2.2.2(i)(B) of RFP	**Estimated Project coct (EPC) if the project being invited**	**Technical Threshold Capacity**	**Estimated Project coct (EPC) if the project being invited**	**Technical Threshold Capacity**
		Estimated project cost > 100 Crore of stand-alone specialize projects	1.0 time of the estimate project cost of Rs. 1000 Crore, whichever is less	Estimated project cost > 1000 Crore of stand-alone specialize projects	1.0 time of the estimate project cost of Rs. 1000 Crore, whichever is less
5	2.2.2.2(ii) of RFP	**For normal Highways projects (including major bridges/ROB/Flyovers/Tunnels):** Provided that at least one similar work of 20% of Estimated Project Cost [Rs. --Cr.] shall		**For normal Highways projects (including major bridges/ROB/Flyovers/Tunnels):** Provided that at least one similar work of 20% of Estimated Project Cost [Rs. -- Cr.] shall have	

S. No	Reference to Clause	As per instant RFP	Modified Clause proposed
		have been completed from the Eligible Projects in Category 1 and/or Category 3 specified in Clause 2.2.2.5. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed, if more than 90% of the value of work has been completed value of work is equal to or more than 20% of the estimated project cost. Eligible projects shall include the following: **(a) Widening/ reconstruction/up-gradation works on NH/SH/Expressway or on any category of road taken up under CRF, ISC/EI, SARDP, LWE** **(b) Widening/reconstruction/up-gradation on MDRs with loan assistance from multilateral agencies or on BOT basis.** **(c) Widening/reconstruction/up-gradation work of roads in Municipal Corporation limits, construction of Bypasses** **(d) Construction of stand-alone bridges, ROBs, tunnels** **(e) Construction/reconstruction of linear projects like airport runways, railways (construction/re-construction of railway yards for keeping containers etc) metro rail and ports (including construction/re-construction of Jetties)** If any Major Bridge/ROB/Flyover/Tunnel is (are) part of the project, then the Bidder shall necessarily demonstrate additional experience in construction of Bridge/ROBs/Flyovers/Tunnel in the last 10 (Ten) financial years preceding the Bid Due Date i.e. shall have completed atleast one similar Bridge/ROB/Flyover/Tunnel of following sizes: (a) In case, longest span of bridge/ROB/flyover is less than or equal to 60m, no additional qualification is required. (b) When longest span is more than 60 m: 50% of the longest span or 100 m, whichever is less, of the structure proposed in this project. (c) in case of tunnel is a part of project having 200m, then no additional qualification is required.	been completed from the Eligible Projects in Category 1 and/or Category 3 specified in Clause 2.2.2.5. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the estimated project cost. Eligible projects shall include the following: **(a) Widening/ reconstruction/up-gradation works on NH/SH/Expressway or on any category of road taken up under CRF, ISC/EI, SARDP, LWE** **(b) Widening/reconstruction/up-gradation on MDRs with loan assistance from multilateral agencies or on BOT basis.** **(c) Widening/reconstruction/up-gradation work of roads in Municipal Corporation limits, construction of Bypasses** **(d) Construction of stand-alone bridges, ROBs, tunnels** **(e) Construction/reconstruction of linear projects like airport runways, railways (construction/re-construction of railway tracks, yards for keeping containers etc) metro rail and ports (including construction/re-construction of Jetties)** If any Major Bridge/ROB/Flyover/Tunnel is (are) part of the project, then the Bidder shall necessarily demonstrate additional experience in construction of Major Bridge /ROBs/Flyovers/Tunnel in the last 10 (Ten) financial years preceding the Bid Due Date i.e. shall have completed atleast one similar Major Bridge/ ROB/Flyover/Tunnel of following sizes: (a) In case, longest span of bridge/ROB/flyover is less than or equal to 60m, no additional qualification is required. (b) When longest span is more than 60 m: 50% of the longest span or 100 m, whichever is less, of the structure proposed in this project. (c) In case tunnel is part of project having length less than or equal to 200 mtr, then no additional qualification is required. (d) When length of tunnel more than 200 m: 50% of the cross sectional area of proposed tunnel or two lane highway tunnel cross-sectional area,

S. No	Reference to Clause	As per instant RFP	Modified Clause proposed
		(d) When length of tunnel more than 200 m: 50% of the cross sectional area of proposed tunnel or two lane highway tunnel cross-sectional area, whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less. For the purpose of this requirement, tunnel may have single/twin tubes for roads/railways/metro rail/irrigation/hydroelectricity projects etc.	whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less. For the purpose of this requirement, tunnel may have single/twin tubes for roads/railways/metro rail/irrigation/hydroelectricity projects etc.
6	2.2.2.2.(iii)(a)(a1) of the RFP	**(a) Major bridges/ROB/Flyover projects:** **(a1) In case the cost of specialized project is less than or equal to Rs. 1000 Cr:** The sole Bidder shall have completed at least one similar Major Bridge/ ROB/ Flyover project in the last 10 (Ten) financial years preceding the Bid Due Date, having span equal to or greater than 50% of the longest span or 100 m, whichever is less of the structure proposed in this project and also the cost of such similar project shall be atleast 20% of the Estimated Project Cost. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost	**(a) Major bridges/ROB/Flyover projects:** **(a1) In case the cost of specialized project is less than or equal to Rs. 1000 Cr:** The bidder shall have completed at least one similar Major Bridge/ ROB/ Flyover project in the last 10 (Ten) financial years preceding the Bid Due Date, having span equal to or greater than 50% of the longest span or 100 m, whichever is less of the structure proposed in this project and also the cost of such similar project shall be atleast 20% of the Estimated Project Cost. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost
7	2.2.2.2.(iii)(b) of the RFP	**(b) Tunnel project:** The Sole Bidder or in case the Bidder being a Joint Venture, any member of JV shall have completed atleast one tunnel project in the last 10 (Ten) financial years preceding the Bid Due Date, consisting of single or twin tubes (including tunnel(s) for roads/Railway /Metro rail/ irrigation/ hydro-electric projects etc.) having atleast 50% of the cross-sectional area of the tunnel to be constructed or cross-sectional area of 2 lane highway tunnel, whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less and the cost of such project shall be atleast 20% of the Estimated Project Cost or Rs. 1000 crore, whichever is less. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost or ₹ 1000 Cr., whichever is less.	**(b) Tunnel project:** The Bidder shall have completed atleast one tunnel project in the last 10 (Ten) financial years preceding the Bid Due Date, consisting of single or twin tubes (including tunnel(s) for roads/Railway /Metro rail/ irrigation/ hydro-electric projects etc.) having atleast 50% of the cross-sectional area of the tunnel to be constructed or cross-sectional area of 2 lane highway tunnel, whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less and the cost of such project shall be atleast 20% of the Estimated Project Cost or Rs. 1000 crore, whichever is less. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost or ₹ 1000 Cr., whichever is less.

S. No	Reference to Clause	As per instant RFP	Modified Clause proposed
8	2.2.2.5(v) of RFP	Maintenance works are not considered as eligible project for evaluation as per instruction No.6 to Annex-IV. As such works with nomenclature like PR, OR, FDR, SR, site/micro grading, surface renewal, resurfacing work, Tarring, B.T. surface work, temporary restoration, urgent works, periodic maintenance, repair & rehabilitation, one time maintenance, permanent protection work of bank, external pre stressing, repair of central hinge, short term OMT contract of NHAI, any type of work related to border fencing, work of earthwork alone, construction of buildings/ hostels, etc., or not specified, shall not be considered. However, such maintenance works shall be considered as eligible projects in case of Maintenance works to be taken up on EPC mode.	Maintenance works are not considered as eligible project for evaluation as per instruction No.6 to Annex-IV. As such works with nomenclature like PR, OR, FDR, SR, site/micro grading, surface renewal, resurfacing work, Tarring, B.T. surface work, temporary restoration, urgent works, periodic maintenance, repair & rehabilitation, one time maintenance, permanent protection work of bank, external pre stressing, repair of central hinge, short term OMT contract of NHAI, any type of work related to border fencing, work of earthwork alone, construction of buildings/ hostels/hospitals, etc., or not specified, shall not be considered. However, such maintenance works shall be considered as eligible projects in case of Maintenance works to be taken up on EPC mode.
9	2.2.2.5(vi) of RFP	The works such as Improvement in Riding Quality work (IRQP/IRQ), shall be considered for Technical Capacity [2.2.2.2 (i)] but not for similar completed works [2.2.2.2 (ii) & 2.2.2.2 (iii)]. However, such work shall be considered for single completed works [2.2.2.2 (ii)] in case of Maintenance works to be taken up on EPC mode.	The works such as Improvement in Riding Quality work (IRQP/IRQ), shall be considered for Technical Capacity [2.2.2.2 (i)] but not for similar completed works [2.2.2.2 (ii) & 2.2.2.2 (iii)]. However, such work shall be considered for similar completed works [2.2.2.2 (ii)] in case of Maintenance works to be taken up on EPC mode.

06/10/22

(K.C. Bhatt)
Dy. General Manager (T)

Schedule

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1. The Site

Site of the Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

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 in Clause 8.2 (i) of this Agreement.

The alignment plans of the Project Highway are specified in Annex-III. 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 Annexure-III based on site/design requirement.

The status of the environment clearances obtained or awaited is given inAnnex IV.

Annex - I

(Schedule-A)

Site

1. The Site

The Site of the Project Highway comprises the section of National Highway -39 (New NH-2) from Daili (End of Kangpokpi Bypass) (Ex. Km276+578of NH-39) to Kuraopokpi (Ex Km288+815 of NH-39) in the state of Manipur. The contract package of the project comprises the rehabilitation and upgradation of existing two lanes to 4 lane divided carriageway configuration. The land, carriageway and structures comprising the Site are described below:

2. Land

The Site of the Project Highway comprises the land (existing right of way (ROW)) as described below:

S. No	Existing Chainage (Km)		Existing ROW (m)	Remarks
	From	To		
1	276+578	288+815	12	

3. Carriageway

The present carriageway of the Project Highway is generally Two Lane carriageway. The type of the existing pavement is flexible and road width details of are as below:

Ex. Chainage (Km)		Length (m)	Terrain		Carriageway	
From	To		LHS	RHS	Type	Width (m)
276+578	278+800	2222	Valley	Hilly	BT	6.3/6.8
278+800	279+000	200	Rolling	Rolling	BT	6.3
279+000	280+600	1600	Rolling	Rolling	BT	7
280+600	281+800	1200	Rolling	Rolling	BT	6.3
281+800	282+200	400	Hilly	Rolling	BT	6.2
282+200	283+600	1400	Rolling	Rolling	BT	6.2
283+600	283+800	200	Valley	Hilly	BT	6.6/6.8
283+800	287+600	3800	Valley	Hilly	BT	6.6
287+600	288+815	1215	Rolling	Rolling	BT	6.8/6.5
Total Length (km)		12.237				

4. Major Bridges

The Site includes the following Major Bridges:

S No.	Ex. Chainage	Ex. Span arrangement (No. x Span)	Total Outer Width (m)	Type of Structure		
				Superstructure	Substructure	Foundation
NIL						

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. No.	Existing Chainage (KM)	Type of Structure		No. of Spans with span length(m)	Width (m)	ROB /RUB	Remarks
		Found-ation	Super-structure				
NIL							

6. Grade separators

The Site includes the following grade separators:

S. No.	Existing Chainage (KM)	Type of Structure		No. of Spans with span length (m)	Width (m)
		Foundation	Super structure		
NIL					

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Ex. Chainage (Km)	Ex. Span arrangement (No. x Span)	Total Outer Width of Deck (m)	Type of Structure		
				Superstructure	Substructure	Foundation
1	279+357	1 x 20.5	8.5	RCC-T Beam	RCC wall type Abutment	Open
2	281+333	1 x 17.0	10.5	RCC-T Beam	RCC wall type Abutment	Open
3	283+525	1 x 26.5	8.3	PSC I Beam with RCC Deck	RCC wall type Abutment	Open

S. No.	Ex. Chainage (Km)	Ex. Span arrangement (No. x Span)	Total Outer Width of Deck (m)	Type of Structure		
				Superstructure	Substructure	Foundation
4	286+411	1 x 6.5	12.0	Solid slab	RCC wall type Abutment	Open
5	287+381	1 x 14.5	12.0	RCC-T Beam	RCC wall type Abutment	Open
6	288+621	1 x 10.0	10.3	Solid slab	RCC wall type Abutment	Open

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location/ Existing Chainage (KM)	Remarks
NIL		

9. Underpasses (Vehicular, Non Vehicular)

The Site includes the following underpasses:

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

10. Culverts

Pipe Culverts:

The Site has the following existing pipe culverts:

S. No.	Ex. Chainages (Km)	Type of Culvert	No. of Pipe	Pipe Dia (m)	Carriageway Width (m)	Remarks
1	276+583	Pipe	1	1	7.5	Blocked-R
2	276+768	Pipe	1	1	7	
3	279+848	Pipe	1	1		
4	280+099	Pipe	1	1		
5	280+474	Pipe	1	1	6	
6	281+018	Pipe	1	1	6	
7	281+895	Pipe	1	1	7.2	Blocked
8	282+867	Pipe	1	1	6.2	
9	283+288	Pipe	1	1	6.2	

S. No.	Ex. Chainages (Km)	Type of Culvert	No. of Pipe	Pipe Dia (m)	Carriageway Width (m)	Remarks
10	284+748	Pipe	1	1	6.8	
11	285+468	Pipe	1	1	7.2	
12	285+560	Pipe	1	1		
13	286+024	Pipe	1	1		
14	286+097	Pipe	1	1		
15	286+254	Pipe	-	-	-	Blocked
16	286+387	Pipe	1	1	6.6	
17	286+794	Pipe	1	1	7	
18	287+090	Pipe	1	1		
19	287+137	Pipe	1	1	6.6	
20	287+479	Pipe	1	1	6.8	
21	287+576	Pipe	1	1	6.8	
22	287+770	Pipe	1	1	9	

Slab Culverts

The Site has the following existing slab culverts:

S. No.	Ex. Chainages (Km)	Type of Culvert	Thickness of Slab (m)	Span Arrangement	Clear Span (m)	Carriageway Width (m)	Remarks
1	276+906	Slab	0.15	1	1	6.8	
2	277+787	Slab	0.5	1	2.6	9.7	
3	277+980	Slab	0.3	1	1	6.8	
4	278+234	Slab	0.3	1	3.1	6.2	
5	278+350	Slab	0.2	1	1	6.5	
6	278+466	Slab	0.2	1	1	6.4	
7	278+791	Slab		1	1.2		
8	280+022	Slab		1	3		
9	280+299	Slab	0.3	1	1.2	6.2	
10	281+093	Slab	0.2	1	1	6.5	
11	281+225	Slab		1	3		
12	281+524	Slab	0.3	1	2	6.8	
13	281+843	Slab	0.4	1	3.5	7.2	
14	282+055	Slab	0.4	1	5.1	7	
15	282+192	Slab	0.3	1	1.1	7	
16	282+269	Slab	0.2	1	1	7	
17	282+445	slab	0.5	1	2	9	
18	282+736	slab	0.5	1	2.5	9.6	
19	283+082	Slab	0.4	1	4.3	6.2	
20	283+825	Slab	0.5	1	2.5	9.5	
21	283+928	Slab	0.2	1	3.2	6	
22	284+210	Slab	0.3	1	1.8	6.8	
23	284+558	Slab	0.2	1	1.6	6.8	

S. No.	Ex. Chainages (Km)	Type of Culvert	Thickness of Slab (m)	Span Arrangement	Clear Span (m)	Carriageway Width (m)	Remarks
24	284+625	Slab	0.2	1	1	6.3	
25	284+680	Slab		1	1.6		
26	284+837	Slab	0.4	1	2	6.8	
27	284+900	Slab	0.3	1	2.8	6.8	
28	285+036	Slab	-	-	Blocked	-	Blocked
29	285+114	Slab	0.3	1	3	6	
30	285+373	Slab		1	2		
31	285+435	Slab	0.3	1	1.3	7.2	
32	285+502	Slab	0.3	1	2.1	7	
33	285+607	Slab	0.3	1	2.1	6.8	
34	285+682	Slab	0.3	1	2.1	7	
35	285+709	Slab	0.1	1	1.2	7	
36	285+783	Slab	0.2	1	1	7	
37	285+847	Slab	0.2	1	2	7	
38	286+147	Slab	0.5	1	2.7	9.2	
39	286+347	Slab	0.2	1	1	7	
40	286+597	Slab	0.2	1	1.2	7	
41	286+865	Slab	0.5	1	2.5	10	
42	287+065	Slab	0.2	1	1	6.5	
43	287+161	Slab	0.3	1	2.2	6.5	
44	287+260	Slab	0.3	1	3.5	6.5	
45	287+526	Slab	0.25	1	1	6.8	
46	287+641	Slab	-	-	-	-	Blocked
47	287+705	Slab	0.3	1	1.6	7.2	
48	287+863	Slab		-	-	-	Blocked
49	287+989	Slab		1	2		
50	288+124	Slab	0.3	1	2	7.2	
51	288+310	Slab	0.2	1	1.6	7	

Other Culverts

11. Bus bays & Bus Shelters

The details of bus stops on the site are as follows:

S. No.	Ex. Chainage (Km)	Ex. Bus Stop	Side	Remarks
1	278+731	Bus Stop	LHS	Tumnoupokpi
2	279+183	Bus Stop	LHS	Tumnoupokpi
3	280+710	Bus Stop	RHS	Keithelmanbi
4	280+940	Bus Stop	RHS	Keithelmanbi

S.No	Ex. Chainage (Km)	Ex. Bus Stop	Side	Remarks
5	281+880	Bus Stop	RHS	Keithelmanbi
6	282+485	Bus Stop	RHS	Keithelmanbi
7	283+488	Bus Stop	RHS	Bongmoul
8	283+947	Bus Stop	LHS	Bongmoul
9	287+577	Bus Stop	LHS	Saparmeina
10	288+600	Bus Stop	LHS	Saparmeina

12. Truck Lay byes

The details of truck lay byes are as follows:

S. No.	Existing Chainage (km)	Length(m)	Left Hand Side	Right Hand Side
NIL				

13. Road side drains

S. No.	Existing Chainage (Km)		Type	
	From	To	Masonry/cc (Pukka)	Earthen (Kutcha)
Nil				

14. Major junctions

The details of Major junctions are as follows:

SN	Ex. Chainage (Km)	At Grade/ Grade Separated	Details of Cross Road		Starts From
			Direction (LHS/RHS)	Road Type (NH/SH/MDR)	
1	274+120	At Grade	RHS	SH	Kangpokpi

15. Minor junctions

The details of the minor junctions are as follows:

S. No	Existing Chainage (Km)	Type of Junction	Side	Width of Cross Road	Village/Town Name
1	278+700	T	RHS	2.2	Tumnoupokpi
2	281+700	+	BOTH	2.1/ 2.6	Keithelmanbi
3	281+850	+	BOTH	6.0/ 4.2	Keithelmanbi

S. No	Existing Chainage (Km)	Type of Junction	Side	Width of Cross Road	Village/Town Name
4	281+900	T	RHS	2	Keithelmanbi
5	283+950	T	RHS	3.9	Keithelmanbi
6	286+680	T	RHS	6.6	Keithelmanbi
7	286+760	T	RHS	3.1	Keithelmanbi
8	287+575	T	RHS	3.5	Phoibih
9	288+060	T	RHS	2.7	Phoibih
10	288+125	T	LHS	2.4	Saparmeina
11	288+150	T	RHS	5.7	Saparmeina
12	288+255	T	LHS	3.8	Saparmeina
13	288+265	T	RHS	6	Saparmeina
14	288+575	T	LHS	5.3	Saparmeina
15	288+640	T	RHS	6.5	Saparmeina

16. Bypasses

The details of the bypasses are as follows:

S. No.	Name of bypass (town)	Chainage (km)	Length	Carriageway	
		From --- to	(in Km)	Width (m)	Type
NIL					

17. Other structures

- Nil –

18. Referencing

The relationship between the "Existing Chainage" as per field survey and "Design Chainage" is given below:

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Remarks
1	276+578	274+610	Start of Package-4b
2	277+000	275+312	
3	278+000	276+311	
4	279+000	277+299	
5	280+000	278+297	
6	281+000	279+308	
7	282+000	280+300	

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Remarks
8	283+000	281+295	
9	284+000	282+292	
10	285+000	283+239	
11	286+000	284+198	
12	287+000	285+189	
13	288+000	286+185	
14	288+815	287+000	End of Package-4b

Annex - II

(Schedule-A)

Utilities

The Site includes the following Utilities:

1. Electric Utilities-MSPDCL:

New HT DP	10
Affected DP	2
HT Single Pole	15
Affected LT Poles	133
Affected DTR	5
Affected HT Line	0.64
Affected LT Line	0.5 km
Street Lamp	17
Affected HT Poles	3
New LT pole	54
Affected AB cable 3^{ϕ}	1.2Km
Composite Pole	4

2. Distribution Pipe underground-PHED

S. No.	Village	Pipe Size	Side	Chainage (Km)		Length (m)
				From	To	
1	Kalapahar	65 mm	Right	277+670	278+000	430
2	Kaithalmanbi	65 mm	Right	278+400	279+650	1350
3	Kaithalmanbi	65 mm	Right	278+700	279+650	1050
4	Kalapahar	100 mm	Right	277+570	278+000	530
5	Kaithalmanbi & Bongmol	100 mm	Right	279+830	282+100	2370
6	Saparmaina	100 mm	Right	286+050	286+825	875
7	Kaithalmanbi & Bongmol	80 mm	Both	279+830	281+900	4240
8	Saparmaina	80 mm	Both	286+050	286+825	1650
9	Bongmol	32 mm	Right	281+700	282+050	450
10	Saparmaina	32 mm	Right	286+050	286+825	875

3. Other Pipes -PHED

Others PHED Pipe lines/structures				
Sl. No.	Village	Chainage	Remarks	
1	Bongmol	281+400	Water Distribution Tanks	
2	Leikop	282+000	Community Toilets	
3	Kaubru Leikha	284+600	Community Toilets	

4	Saparmaina	286+825	Community Toilets	
5	Saparmaina	286+050	Solid waste Management	

4. Minor Irrigation:

Pick-up weir and Canal	53m	284+700	Near the Koubrulekha Temple

In construction of Pick-up weir & irrigation canal across Thangaibi at Laicha Nepali (Kangpokpi) The current structure affected length of canal is 53m only, but since the Head work needs to be shifted to another feasible area, the length of canal will be increased.

Annex - III

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

S. No.	Ex Chainage (m)		Design Chainage(m)		Length (m)	PROW width (m)	Date of Providing ROW*
	From	To	From	To			
1	276+578	276+593	274+610	274+620	10	55.2	90% land will be available at the time of appointed date and balance 10% land after 150 (one hundred and fifty) days from Appointed date.
2	276+593	276+331	274+620	274+650	30	53.5	
3	276+331	276+387	274+650	274+700	50	55.5	
4	276+387	276+487	274+700	274+800	100	58	
5	276+487	276+537	274+800	274+850	50	52.5	
6	276+537	276+637	274+850	274+950	100	45	
7	276+637	276+786	274+950	275+100	150	47.5	
8	276+786	276+987	275+100	275+300	200	45	
9	276+987	277+088	275+300	275+400	100	47.5	
10	277+088	277+138	275+400	275+450	50	49	
11	277+138	277+189	275+450	275+500	50	54	
12	277+189	277+344	275+500	275+650	150	57.5	
13	277+344	277+395	275+650	275+700	50	52.5	
14	277+395	277+495	275+700	275+800	100	45	
15	277+495	277+584	275+800	275+890	90	46.5	
16	277+584	277+697	275+890	276+000	110	45	
17	277+697	277+849	276+000	276+150	150	47.5	
18	277+849	278+187	276+150	276+500	350	52.5	
19	278+187	278+239	276+500	276+550	50	49	
20	278+239	278+330	276+550	276+640	90	46.5	
21	278+330	278+690	276+640	277+000	360	45	
22	278+690	278+740	277+000	277+050	50	47.5	
23	278+740	278+840	277+050	277+150	100	50	
24	278+840	278+890	277+150	277+200	50	47.5	
25	278+890	279+598	277+200	277+900	700	45	
26	279+598	279+698	277+900	278+000	100	57	
27	279+698	279+748	278+000	278+050	50	47.5	
28	279+748	279+848	278+050	278+150	100	45	
29	279+848	279+898	278+150	278+200	50	47.5	
30	279+898	280+001	278+200	278+300	100	49	
31	280+001	280+051	278+300	278+350	50	47.5	
32	280+051	280+201	278+350	278+500	150	45	
33	280+201	280+451	278+500	278+750	250	37.5	
34	280+451	280+601	278+750	278+900	150	43.8	
35	280+601	280+651	278+900	278+950	50	41.3	
36	280+651	281+293	278+950	279+600	650	37.5	
37	281+293	281+393	279+600	279+700	100	39.8	

S. No	Ex Chainage (m)		Design Chainage(m)		Length (m)	PROW width (m)	Date of Providing ROW*
	From	To	From	To			
38	281+393	281+543	279+700	279+850	150	37.5	
39	281+543	281+693	279+850	280+000	150	43.8	
40	281+693	281+743	280+000	280+050	50	37.5	
41	281+743	281+893	280+050	280+200	150	39.8	
42	281+893	281+943	280+200	280+250	50	43.5	
43	281+943	282+349	280+250	280+650	400	45	
44	282+349	282+449	280+650	280+750	100	46.5	
45	282+449	283+406	280+750	281+700	950	45	
46	283+406	283+555	281+700	281+850	150	47.5	
47	283+555	283+757	281+850	282+050	200	45	
48	283+757	283+858	282+050	282+150	100	46.5	
49	283+858	283+911	282+150	282+200	50	49	
50	283+911	283+966	282+200	282+250	50	52.5	
51	283+966	284+134	282+250	282+400	150	57.5	
52	284+134	284+189	282+400	282+450	50	52.5	
53	284+189	284+293	282+450	282+550	100	54	
54	284+293	284+433	282+550	282+690	140	46.5	
55	284+433	284+636	282+690	282+890	200	49	
56	284+636	284+746	282+890	283+000	110	47.5	
57	284+746	284+954	283+000	283+200	200	52.5	
58	284+954	285+011	283+200	283+250	50	45	
59	285+011	285+111	283+250	283+350	100	46.5	
60	285+111	285+211	283+350	283+450	100	45	
61	285+211	285+312	283+450	283+550	100	46.5	
62	285+312	285+404	283+550	283+640	90	45	
63	285+404	285+617	283+640	283+840	200	47.5	
64	285+617	285+682	283+840	283+900	60	52.5	
65	285+682	285+945	283+900	284+150	250	57.5	
66	285+945	286+001	284+150	284+200	50	59	
67	286+001	286+202	284+200	284+400	200	46.5	
68	286+202	286+353	284+400	284+550	150	47.5	
69	286+353	286+553	284+550	284+750	200	45	
70	286+553	286+858	284+750	285+050	300	46.5	
71	286+858	286+909	285+050	285+100	50	52.5	
72	286+909	287+099	285+100	285+290	190	57.5	
73	287+099	287+159	285+290	285+350	60	52.5	
74	287+159	287+458	285+350	285+650	300	45	
75	287+458	287+710	285+650	285+900	250	46.5	
76	287+710	288+015	285+900	286+200	300	45	
77	288+015	288+566	286+200	286+750	550	41.3	
78	288+566	288+606	286+750	286+790	40	45	
79	288+606	288+656	286+790	286+840	50	53.5	
80	288+656	288+706	286+840	286+890	50	41.3	
81	288+706	288+815	286+890	287+000	110	45	

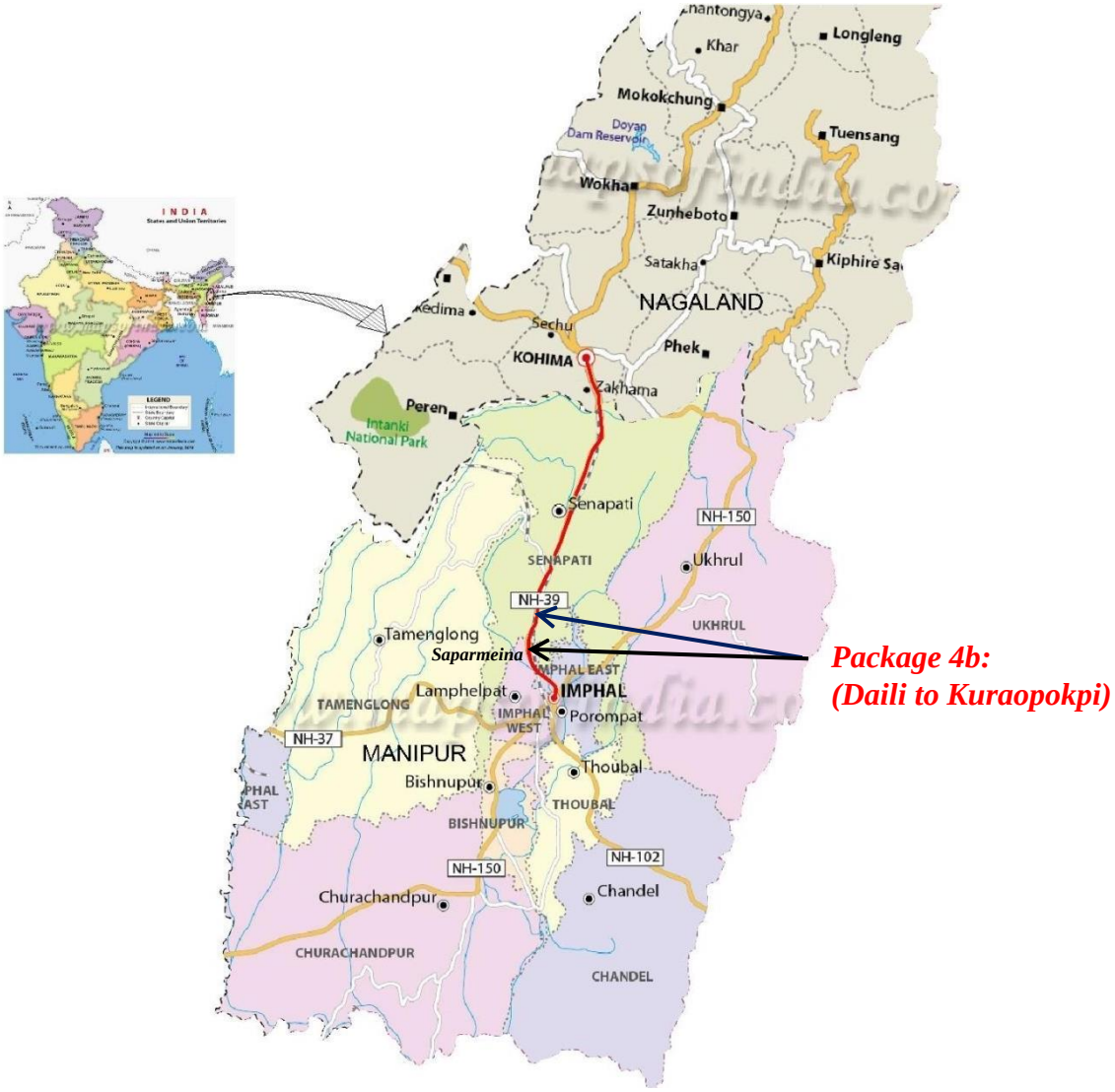
- The dates specified herein, shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.

Annex - IV

(Schedule-A)

Alignment Plans

The existing alignment of the Package-4B i.e. Daili (End of Kangpokpi Bypass) to Kuraopokpi section of Project Highway shall be modified as per the Alignment plan.



The proposed Alignment Plan and Profile of the Project Highway is available on e-Portal. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL.

Annex - V

(Schedule-A)

Environment Clearances

As per GoI, MoEF notification No. 21-270/2008-IA, III dated 22nd August 2013, proposed project involves expansion of 12.390 km existing National Highway (less than 100 Km). As a result Environmental clearances will not be required from MoEF.

However, forest clearance is required for Tree cutting.

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SCHEDULE - B

(See Clause 2.1)

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. Rehabilitation and Augmentation as Four lane divided carriageway

Rehabilitation and Upgradation shall include Four lane divided carriageway of 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 Four-Laning

Widening of the Existing Highway

The Project Highway shall follow the existing alignment unless otherwise specified by the Authority or shown in the alignment plan 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.

Width of Carriageway

Four laning with paved shoulder from Daili (end of Kongpokpi bypass) (Km274+610) to Kuraopokpi (Km287+000) shall be undertaken. The width of paved carriageway shall be 2x9m wide in accordance with the Typical Cross Section (TCS) drawings presented in ***Appendix B1- Typical Cross Sections or Manual referred to in the Schedule-D*** (herein after called the "Manual") unless otherwise specified in this Schedule-B and Schedule-D.

The total roadway width of project highway shall be 18 m wide.

Provided that in the built-up areas the width of the carriageway shall be as specified in the following table:

Built-up stretch (Township)	**Design Chainage (Km)**		**Roadway (m)**	**Paved Width (m)**	**(Typical cross section) (Ref. to Schedule B Appendix B-1)**
	From	**To**			
NIL					

Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.2.1 above.

2. Geometric Design and General Features

General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual (IRC:SP:84-2014).

Design speed

The design Speed for the project highway adopted for plain/rolling terrain is 100km/hr. However due to certain site constraints, the minimum design speed adopted for plain/rolling terrain is 80km/hr. at locations mentioned in Schedule - D.

Improvement of the existing road geometrics

The alignment of existing road has been improved at many locations along the route either by eliminating sharp curves and/or increasing the radii of horizontal curves. Also, at few locations the existing steep gradients have been improved through cutting/filling so as to conform the requirement of IRC:SP:84-2014 and achieving ruling gradient for plain/rolling terrain. So the reconstruction of road shall follow the improved alignment as enclosed in the bid document.

Sl. No.	Design Chainage (Km)		Type of deficiency	Remarks
	From Km	To Km		
As per Alignment Plan (Annex-III, Schedule A)				

Details of proposed Realignments:

S. No	Design Chainage(Km)		Side	Design Length (Km)	Remarks
	From	To			
As per Alignment Plan (Annex-III, Schedule A)					

Details of Proposed Bypasses:

S. No	Design Chainage (Km)		Side	Design Length (km)	Remarks
	From	To			
Nil					

Right of Way

Details of the Right-of-Way (ROW) are given in Annex II of Schedule-A.

Type of shoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided in the following stretch:

Design Chainage (Km)		Fully paved shoulders/ footpaths	(Typical cross section) (Ref. to Schedule B Appendix B-1)
From	To		
NIL			

(b) In open country, paved shoulders of 1.5 m width shall be provided with same pavement layers of carriageway and balance 2.0m wide earthen shoulder shall be covered with 150mm thick compacted layer of granular/hard material. The granular sub-base (GSB) layer to be extended till side slope.

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in the relevant Manual.

Lateral and vertical clearances at Underpasses

Lateral and vertical clearances at underpasses and provisions of guard rails/ crash barriers shall be as per the paragraph 2.10 of the Manual.

Lateral Clearance: The width of the openings at underpasses shall be as follows:

S. No.	Design Chainage(Km)	Span/opening (m)	Remarks
Nil			

Lateral and vertical clearances at overpasses

Lateral and vertical clearances at overpasses and provision of guard rails/crash barriers shall be as per the paragraph 2.11 of the Manual.

Lateral Clearance: The size of the openings at overpasses shall be as follows:

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

Service roads / Slip roads

Service roads/Slip roads shall be constructed at the locations and for the lengths indicated below:

S. No.	Design Chainage	RHS / LHS/ or Both sides	Length (km)
NIL			

Grade separated structures:

Grade separated structures shall be provided as per the paragraph 2.13 of the Manual. The requisite particulars are given below:

S. No.	Location of Structure	Deck Width (m)	Number and length of spans	Approach gradient
NIL				

Cattle and Pedestrian under pass / over pass

Cattle and Pedestrian underpass/ overpass shall be constructed as follows:

S. No.	Location	Type of crossing
NIL		

Typical Cross Section of the Project Highway

Typical Cross Sections (TCS) have been developed as TCS-1 to TCS-10& TCS-13

showing configuration along with a schedule of their applicability is presented in Appendix B-1 to this Schedule-B.

3. Intersections and Grade Separators

All intersections and Grade separators shall be as per Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tables below.

(a) At-grade intersections

Major Junctions: -

S. No	Existing Chainage (Km)	Design Chainage (Km)	Type of Junction	Side	Remarks
Nil					

Minor Junctions: -

S. No	Existing Chainage (Km)	Design Chainage (Km)	Type of Junction	Side	Proposed Width	Village/Town Name
1	278+366	276+675	T	RHS	3.5	Tumnoupokpi
2	278+747	277+056	Y	LHS	3.5	Tumnoupokpi
3	278+833	277+142	Y	RHS	3.5	Tumnoupokpi
4	280+404	278+700	T	RHS	5.5	Keithelmanbi
5	280+530	278+826	T	RHS	3.5	Keithelmanbi
6	280+600	278+896	T	RHS	3.5	Keithelmanbi
7	280+707	279+003	T	RHS	3.5	Keithelmanbi
8	281+377	279+685	Y	LHS	3.5	Keithelmanbi
9	281+385	279+693	Y	RHS	3.5	Keithelmanbi
10	281+493	279+801	Y	RHS	3.5	Keithelmanbi
11	281+515	279+823	T	LHS	3.5	Keithelmanbi
12	281+574	279+882	T	RHS	3.5	Keithelmanbi
13	282+152	280+452	T	RHS	3.5	Keithelmanbi
14	283+195	281+490	T	RHS	3.5	Keithelmanbi
15	283+719	282+013	Y	RHS	5.5	Bongmoul
16	286+385	284+581	Y	RHS	3.5	Phoibih
17	286+463	284+659	Y	RHS	3.5	Phoibih
18	287+275	285+465	T	RHS	3.5	Phoibih
19	287+763	285+952	T	RHS	3.5	Phoibih

S. No	Existing Chainage (Km)	Design Chainage (Km)	Type of Junction	Side	Proposed Width	Village/Town Name
20	287+833	286+022	Y	LHS	3.5	Saparmeina
21	287+869	286+058	Y	RHS	3.5	Saparmeina
22	287+956	286+146	T	LHS	3.5	Saparmeina
23	287+972	286+162	T	RHS	5.5	Saparmeina
24	288+581	286+765	Y	LHS	5.5	Saparmeina
25	288+636	286+820	Y	RHS	5.5	Saparmeina

For the proper drainage, additional Pipe Culvert (NP4 class) shall be provided on cross roads as per site condition.

(b) Grade separated intersection with/without ramps

S. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the structures
NIL				

4. Road Embankment and Cut Section

The reconstruction of the existing road and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the Manual and the specified cross sectional details. Deficiencies in the Plan and Profile of the existing road shall be corrected.

Raising of the Existing Road

The profile of the existing road at the following locations shall be raised:

S. No.	Chainage		Length	Extent of raising
	From	To		
As per Alignment Plan & Profile (Annex-III, Schedule A)				

5. Pavement Design

Pavement design

Pavement design shall be carried out in accordance with Section 5 of the Manual and IRC:37-2018.

Type of pavement

Flexible pavement should be provided on entire project length.

Design requirements

Pavement design shall be as per section 5 of the Manual and IRC: 37: 2018.

Design Period and Strategy

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.

Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum design traffic of ***30*** Million Standard Axles (MSA).

Reconstruction stretches

The entire length of the Project road requires 'reconstruction' following the Alignment Plan (Annex III-Schedule A). The entire road shall be designed as new flexible pavement.

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual.

7. Design of Structures

General

All bridges, culverts and structures shall be designed and constructed in accordance with section 7 of the Manual and shall conform to the cross-sectional features and other details specified therein.

Width of the carriageway of new bridges and structures shall be as follows:

S. No.	Bridge (Km)	Carriageway width and Cross section Features
As per GAD		

The following structures shall be provided with footpaths:

S. No.	Bridge (Km)	Carriageway width and Cross section Features
As per GAD		

All bridges shall be high-level bridges.

The following structures shall be designed to carry utility servicesspecified in table below:

Sl. No.	Bridge at km	Utility service to be carried	Remarks
To be finalized as per the site condition, during the execution, in consultation with the Authority Engineer.			

Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections for Project Highway.

Culverts

Overall width of all culverts shall be equal to the roadway width of the approaches.

Reconstruction of Existing Culverts:

(i) Reconstruction of Pipe Culvert to Pipe Culvert

The following pipe culverts are proposed for reconstruction to pipe culverts:

S. No.	Location		Proposed Span (m)	Type	Remarks
	Existing	Proposed			
NIL					

(ii) Reconstruction of Pipe/Slab Culvert to Box Culvert

The following pipe/slab culverts are proposed for reconstruction to box culverts:

S. No.	Location		Type	Proposed Span (m)	Remarks
	Existing	Proposed			
1	276+732	274+764	Box Culvert	1X2X2m	
2	276+906	275+221	Box Culvert	1X2X2m	
3	277+980	276+279	Box Culvert	1X2X2m	
4	278+233	276+542	Box Culvert	1X2X2m	
5	278+350	276+659	Box Culvert	1X2X2m	
6	278+465	276+774	Box Culvert	1X2X2m	
7	278+791	277+100	Box Culvert	1X4X4m	Cushion 4.0m
8	279+848	278+147	Box Culvert	1X2X2m	
9	280+021	278+318	Box Culvert	1X2X2m	Cushion 3.0m
10	280+299	278+596	Box Culvert	1X2X2m	
11	280+475	278+771	Box Culvert	1X2X2m	
12	281+018	279+326	Box Culvert	1X2X2m	
13	281+225	279+533	Box Culvert	1X3X2m	
14	282+269	280+569	Box Culvert	1X2X2m	
15	282+446	280+746	Box Culvert	1X3X3m	
16	282+736	281+034	Box Culvert	1x3x3m	
17	282+860	281+157	Box Culvert	1X2X2m	
18	283+288	281+583	Box Culvert	1X2X2m	
19	284+558	282+814	Box Culvert	1X2X2m	
20	285+113	283+352	Box Culvert	1X3X3m	
21	285+373	283+613	Box Culvert	1X2X2m	
22	286+024	284+222	Box Culvert	1X2X2m	
23	286+147	284+345	Box Culvert	1X2X2m	
24	286+348	284+543	Box Culvert	1X2X2m	
25	286+597	284+793	Box Culvert	1X3X3m	
26	287+161	285+350	Box Culvert	1X2X2m	
27	287+381	285+571	Box Culvert	1X2X2m	
28	287+554	285+746	Box Culvert	1X2X2m	
29	287+641	285+830	Box Culvert	1X2X2m	
30	287+771	285+960	Box Culvert	1X2X2m	
31	287+989	286+179	Box Culvert	1X2X2m	
32	288+123	286+308	Box Culvert	1X2X2m	
33	288+310	286+495	Box Culvert	1X2X2m	

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 Appendix B-1 to this Schedule-B. Repairs and strengthening of existing structures where required shall be carried out.

(a) Retaining / widening of Pipe Culverts

S. No.	Ex. Chainage (Km)	Design Chainage (Km)	Type	Size (Nos x dia in m)	Remark
Nil					

(b) Retaining / widening of Slab Culverts

S. No.	Ex. Chainage (Km)	Design Chainage (Km)	Type	Span	Remark
1	278+425	276+087	Slab Culvert	1X2.6m	Widened Left side
2	281+550	279+832	Slab Culvert	1X2m	Widened Both side
3	281+850	280+151	Slab Culvert	1X3.5m	Widened Both side
4	282+075	280+356	Slab Culvert	1X5.1m	Widened Both side
5	283+095	281+377	Slab Culvert	1X4.3m	Widened Both side
6	283+850	282+119	Slab Culvert	1X2.5m	Widened Left side

Additional **New culverts** shall be constructed as per particulars givenin the table below:

S. No.	Design Chainage (Km)	Type	Size (No x span)	Cushion (m)
1	274+629	Box Culvert	1X3X3m	3.0
2	274+925	Box Culvert	1X2X2m	
3	275+415	Box Culvert	1X2X2m	
4	275+800	Box Culvert	1X2X2m	
5	277+385	Box Culvert	1X3X3m	
6	278+920	Box Culvert	1X3X3m	
7	282+510	Box Culvert	1X2X2m	
8	283+001	Box Culvert	1X2X2m	

One additional culvert shall also be provided at each ‘T’ or ‘Y’ shape junction and two additional pipe culvers at each cross roads as per site condition for drainage requirement.

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

Sl. No.	Location		Type	Size	Type of repair required
	Existing	Proposed			
Necessary repair and rehabilitation / strengthening works are to be carried out for all widening and retained culverts as per site condition and as directed by Authority's Engineer.					

Floor protection works shall be as specified in the relevant IRC Codesand Specifications.

Bridges

Existing bridges to be re-constructed

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

a) Major Bridges:

S. No.	Location		Type of Existing structure	Span Arrangement		Deck width
	Existing	Proposed		Existing	Proposed	
NIL						

b) Minor Bridges:

S. No.	Location		Type of Existing structure	Span Arrangement		Deck width
	Existing	Proposed		Existing	Proposed	
NIL						

(ii)The following bridges shall be retained / widened:

a) Major Bridges:

b) Minor Bridges:

S. No	Chainage (km)		Span Arrangement (m)	Outer Width (m)	Super Structure Type	Remarks
	Design	Existing				
1	277+655	279+357	1X20.5	8.5	RCC T-Beam	Retained with general upkeep and maintenance.
2	279+642	281+333	1X17.0	10.5	RCC T-Beam	Retained with general upkeep and maintenance
3	281+824	283+525	1X26.5	8.3	PSC I Beam with RCC Deck	Retained with general upkeep and maintenance
4	284+607	286+411	1X6.7	12.3	RCC Solid Slab	Retained with general upkeep and maintenance

Note: Necessary repair and rehabilitation/ strengthening works are to be carried out for all widening and retained bridges as per site condition and as directed by the Authority's Engineer

Additional New bridges:

New bridges at the following locations on the Project Highway shall be constructed. The GADs of new bridges are attached in Volume II: Drawings folder.

S. No.	Design Chainage	Type of Structure	Proposed Span	Remarks
1	277+655	MNBR	1 x 20.8	New 2 Lane bridge + Existing bridge retained
2	279+642	MNBR	1 x 17.2	New 2 Lane bridge + Existing bridge retained
3	281+824	MNBR	1 x 26.6	New 2 Lane bridge + Existing bridge retained
4	284+607	MNBR	1 x 6.0 (Clear span) x 3.0	New 2 Lane bridge + Existing bridge retained
5	285+450	MNBR	1 x 14.8	New 4 Lane bridge
6	286+805	MNBR	2 x 6.0 (Clear Span) x 3	New 4 Lane bridge

The railings of existing bridges shall be replaced by crash barriers atthe following locations:

S. No.	Location at km	Remarks
NIL		

Repairs/replacements of railing/parapets of the existing bridges shallbe undertaken as follows:

S. No.	Location		Type of Existing structure	Span Arrangement	Remarks
	Existing	Proposed			
As per Note given under clause 7.3.1					

Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.20 of the Manual.

Structures in marine environment

Sl. No.	Location at km	Remarks
NIL		

Rail-road bridges- NIL

Design, construction and detailing of ROB/RUB shall be as specifiedin section 7 of the Manual.

Road over-bridges- NIL

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

S. No.	Chainage	Proposed Span	Type of Superstructure	Deck Width	Remarks
NIL					

Road under-bridges

Road under-bridges (road under railway line) shall be provided at the

following level crossings, as per GAD drawings attached:

S. No.	Location of Level crossing	Proposed Span arrangement
NIL		

Grade separated structures

S. No.	Design Chainage	Type of Structure	Proposed Span (m)	Deck width (M)
NIL				

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.	Location of bridge (km)	Nature and extent of repairs/strengthening to be carried out
Repair of wearing course and partially damaged railing most of existing bridge location. Vegetation growth needs to be removed from existing structure.		

B. ROB / RUB

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

C. Overpasses/Underpasses and other structures

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

W- Beam Metal Crash Barrier

The W beam crash Barriers are proposed where the embankment height is more than 3m height. The locations are as below:

Sl. No.	Design Chainage (Km)		TCS Type	Length (m)
	From	To		
Left Hand Side (LHS)				
1	275+170	275+220	TCS - 5	50
2	275+400	275+500	TCS - 4	100
3	275+800	275+900	TCS - 8	100
4	275+900	275+930	TCS - 1	30
5	276+510	276+630	TCS - 5	120
6	276+630	276+640	TCS - 1	10
7	277+050	277+160	TCS - 7	110
8	278+220	278+270	TCS - 2	50
9	278+270	278+300	TCS - 1	30
10	278+760	278+790	TCS - 13	30
11	278+790	278+900	TCS - 9	110
12	280+090	280+150	TCS - 9	60
13	280+150	280+200	TCS - 10	50
14	280+200	280+230	TCS-10 to TCS-1	30
15	280+620	280+780	TCS - 1	160
16	282+070	282+090	TCS - 6	20
17	282+090	282+150	TCS - 1	60
18	282+150	282+190	TCS - 6	40
19	282+470	282+630	TCS - 5	160
20	282+630	282+880	TCS - 8	250
21	282+880	282+910	TCS - 5	30
22	282+910	282+920	TCS - 6	10
23	283+240	283+260	TCS - 1	20
24	283+260	283+320	TCS - 8	60
25	283+320	283+360	TCS - 1	40
26	283+470	283+520	TCS - 8	50
27	283+520	283+580	TCS - 6	60
28	283+580	283+730	TCS - 5	150
29	283+730	283+800	TCS - 6	70
30	284+170	284+180	TCS - 6	10
31	284+180	284+390	TCS - 4	210
32	284+780	284+790	TCS - 1	10
33	284+790	285+010	TCS - 8	220
34	285+010	285+040	TCS - 5	30
35	285+040	285+050	TCS - 6	10
36	285+670	285+760	TCS - 4	90
37	285+760	285+770	TCS-4 to TCS-9	10
38	285+840	285+910	TCS - 10	70
39	286+890	286+900	TCS - 9	10
40	286+900	286+940	TCS-9 to TCS-1	40
41	286+940	287+000	TCS-10 to TCS-8	60

Sl. No.	Design Chainage (Km)		TCS Type	Length (m)
	From	To		
Right Hand Side (RHS)				
1	274+610	274+630	TCS - 7	20
2	274+630	274+640	TCS - 8	10
3	276+990	277+010	TCS - 1	20
4	277+010	277+160	TCS - 7	150
5	278+150	278+170	TCS - 1	20
6	278+170	278+220	TCS - 8	50
7	278+220	278+290	TCS - 7	70
8	278+290	278+330	TCS - 8	40
9	278+330	278+340	TCS - 1	10
10	281+350	281+410	TCS - 1	60
11	281+550	281+610	TCS - 1	60
12	281+610	281+720	TCS - 1	110
13	281+680	281+808	TCS - 8	128
14	282+720	282+830	TCS - 8	110

The W beam crash Barriers are proposed in both sides, where the radius of the curve upto 450m as given below:

S No	Design Chainage		Length	Remark (Curve Radius)
	Start	End		
Inner edge				
16	276+216	276+410	194	-360
17	276+423	276+655	232	400
18	283+606	283+997	391	360
19	284+029	284+421	392	-360

LEFT Side Outer Edge				RIGHT Side Outer Edge			
S No	CHAINAGE		Length	S No	CHAINAGE		Length
	Start	End			Start	End	
1	276+423	276+510	87	1	276+216	276+410	194
2	276+640	276+655	15	2	284+029	284+421	392
3	283+800	283+997	197				

Protection Work

The Stone Masonry Breast wall have been proposed on hill side section along the roadway edge where cutting is required or cutting is more than available ROW.

Retaining walls are proposed to restrict the earth along the filling section where normal side slope crosses the available ROW. The PCC toe walls are adopted upto the height of

2m from GL and RCC retaining wall where the required height of wall at site is more than 2m.

The project section where the hill cut heights of side slope is more than 25m, Surficial protection and Erosion Control measures have been considered and details of Typical measures for soil and Rocky surface are presented in Appendix B-1 of this Schedule B.

Breast wall and Retaining wall shall be provided in accordance with section 13 of the Manual.

1. Breast wall

The Stone masonry Breast Wall shall be provided at the following locations:

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
1	274+800	274+810	6		1.5		10
2	274+810	274+820	6		1.5		10
3	274+820	274+830	6		3		10
4	274+830	274+840	6		3		10
5	274+840	274+850	6		3		10
6	274+850	274+860	6		1.5		10
7	274+860	274+870	6		1.5		10
8	274+870	274+880	6		1.5		10
9	274+880	274+890	6		3		10
10	274+890	274+900	6		3		10
11	274+900	274+910	6		1.5		10
12	274+910	274+920	6		1.5		10
13	274+920	274+930	6		1.5		10
14	274+930	274+940	6		1.5		10
15	274+940	274+950	6		1.5		10
16	274+950	274+960	6		1.5		10
17	274+960	274+970	6		3		10
18	274+970	274+980	6		3		10
19	274+980	274+990	6		3		10
20	274+990	275+000	6		3		10
21	275+000	275+010	6		3		10
22	275+010	275+020	6		3		10
23	275+020	275+030	6		3		10
24	275+030	275+040	6		3		10
25	275+040	275+050	6		3		10
26	275+050	275+060	6		3		10
27	275+060	275+070	6		3		10
28	275+070	275+080	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
29	275+080	275+090	6		3		10
30	275+090	275+100	6		3		10
31	275+100	275+110	6		3		10
32	275+110	275+120	6		3		10
33	275+120	275+130	6		3		10
34	275+130	275+140	6		3		10
35	275+140	275+150	6		3		10
36	275+150	275+160	6		3		10
37	275+160	275+170	6		3		10
38	275+170	275+180	6		3		10
39	275+180	275+190	5		3		10
40	275+190	275+200	5		3		10
41	275+200	275+210	5		3		10
42	275+210	275+220	5		3		10
43	275+220	275+230	6		3		10
44	275+230	275+240	6		3		10
45	275+240	275+250	6		3		10
46	275+250	275+260	6		1.5		10
47	275+270	275+280	6		0		
48	275+280	275+290	6		1.5		10
49	275+290	275+300	6		3		10
50	275+300	275+310	3		3		10
51	275+310	275+320	3		3		10
52	275+320	275+330	3		3		10
53	275+330	275+340	3		3		10
54	275+340	275+350	3		3		10
55	275+350	275+360	3		3		10
56	275+360	275+370	3		3		10
57	275+370	275+380	3		3		10
58	275+380	275+390	3		3		10
59	275+390	275+400	3		3		10
60	275+400	275+410	4		3		10
61	275+410	275+420	4		3		10
62	275+420	275+430	4		3		10
63	275+430	275+440	4		3		10
64	275+440	275+450	4		3		10
65	275+450	275+460	4		3		10
66	275+460	275+470	4		3		10
67	275+470	275+480	4		3		10
68	275+480	275+490	4		3		10
69	275+490	275+500	4		3		10
70	275+500	275+510	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
71	275+510	275+520	6		3		10
72	275+520	275+530	6		3		10
73	275+530	275+540	6		3		10
74	275+540	275+550	6		3		10
75	275+550	275+560	6		3		10
76	275+560	275+570	6		3		10
77	275+570	275+580	6		3		10
78	275+580	275+590	6		3		10
79	275+590	275+600	6		3		10
80	275+600	275+610	6		3		10
81	275+610	275+620	6		3		10
82	275+620	275+630	6		3		10
83	275+630	275+640	6		3		10
84	275+640	275+650	6		3		10
85	275+650	275+660	6		3		10
86	275+660	275+670	6		3		10
87	275+670	275+680	6		3		10
88	275+680	275+690	6		3		10
89	275+690	275+700	6		3		10
90	275+700	275+710	6		3		10
91	275+710	275+720	6		3		10
92	275+720	275+730	6		1.5		10
93	275+730	275+740	6		1.5		10
94	275+740	275+750	6		1.5		10
95	275+960	275+970	6		1.5		10
96	275+970	275+980	6		1.5		10
97	275+980	275+990	6		3		10
98	275+990	276+000	6		3		10
99	276+000	276+010	6		3		10
100	276+010	276+020	6		3		10
101	276+020	276+030	6		3		10
102	276+030	276+040	6		3		10
103	276+040	276+050	6		3		10
104	276+050	276+060	6		3		10
105	276+060	276+070	6		3		10
106	276+070	276+080	6		3		10
107	276+080	276+090	6		3		10
108	276+090	276+100	6		3		10
109	276+100	276+110	6		3		10
110	276+110	276+120	6		3		10
111	276+120	276+130	6		3		10
112	276+130	276+140	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
113	276+140	276+150	6		3		10
114	276+150	276+160	6		3		10
115	276+160	276+170	6		3		10
116	276+170	276+180	6		3		10
117	276+180	276+190	6		3		10
118	276+190	276+200	6		3		10
119	276+200	276+210	6		3		10
120	276+210	276+220	6		3		10
121	276+220	276+230	6		3		10
122	276+230	276+240	6		3		10
123	276+240	276+250	6		3		10
124	276+250	276+260	6		3		10
125	276+260	276+270	6		3		10
126	276+270	276+280	6		3		10
127	276+280	276+290	6		3		10
128	276+290	276+300	6		3		10
129	276+300	276+310	6		3		10
130	276+310	276+320	6		3		10
131	276+320	276+330	6		3		10
132	276+330	276+340	6		3		10
133	276+340	276+350	6		3		10
134	276+350	276+360	6		3		10
135	276+360	276+370	6		3		10
136	276+370	276+380	6		3		10
137	276+380	276+390	6		3		10
138	276+390	276+400	6		3		10
139	276+400	276+410	6		3		10
140	276+410	276+420	6		3		10
141	276+420	276+430	6		3		10
142	276+430	276+440	6		3		10
143	276+440	276+450	6		3		10
144	276+450	276+460	6		3		10
145	276+460	276+470	6		3		10
146	276+470	276+480	6		3		10
147	276+480	276+490	6		3		10
148	276+490	276+500	6		3		10
149	276+500	276+510	6		3		10
150	276+510	276+520	5		3		10
151	276+520	276+530	5		3		10
152	276+530	276+540	5		3		10
153	276+540	276+550	5		3		10
154	276+550	276+560	5		1.5		10
155	276+560	276+570	5		1.5		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
156	276+570	276+580	5		1.5		10
157	276+580	276+590	5		1.5		10
158	276+590	276+600	5		1.5		10
159	276+600	276+610	5		1.5		10
160	276+610	276+620	5		1.5		10
161	276+620	276+630	5		1.5		10
162	277+210	277+220	2	1.5	1.5	10	10
163	277+220	277+230	2	1.5	1.5	10	10
164	277+230	277+240	2	3	1.5	10	10
165	277+240	277+250	2	1.5	1.5	10	10
166	277+250	277+260	2	1.5	1.5	10	10
167	277+260	277+270	2	1.5	1.5	10	10
168	277+880	277+890	2	1.5	0	10	
169	277+890	277+900	2	1.5	1.5	10	10
170	277+900	277+910	2	1.5	1.5	10	10
171	277+910	277+920	2	3	3	10	10
172	277+920	277+930	2	3	3	10	10
173	277+930	277+940	2	3	3	10	10
174	277+940	277+950	2	3	3	10	10
175	277+950	277+960	2	3	3	10	10
176	277+960	277+970	2	3	3	10	10
177	277+970	277+980	2	3	3	10	10
178	277+980	277+990	2	3	3	10	10
179	277+990	278+000	2	3	3	10	10
180	278+000	278+010	2	3	3	10	10
181	278+010	278+020	2	3	3	10	10
182	278+020	278+030	2	3	3	10	10
183	278+030	278+040	2	3	3	10	10
184	278+040	278+050	2	3	3	10	10
185	278+050	278+060	2	3	3	10	10
186	278+060	278+070	2	3	3	10	10
187	278+070	278+080	2	3	3	10	10
188	278+080	278+090	2	1.5	3	10	10
189	278+090	278+100	2	1.5	3	10	10
190	278+100	278+110	2	1.5	3	10	10
191	278+110	278+120	2	1.5	1.5	10	10
192	278+120	278+130	2	1.5	1.5	10	10
193							
194	279+730	279+740	13		1.5		10
195	279+740	279+750	13	1.5	3	10	10
196	279+750	279+760	13	1.5	1.5	10	10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
197	279+760	279+770	13	1.5	1.5	10	10
198	279+770	279+780	13	1.5	3	10	10
199	279+780	279+790	13		3		10
200	281+880	281+890	6		1.5		10
201	281+890	281+900	6		1.5		10
202	281+900	281+910	6		3		10
203	281+910	281+920	6		3		10
204	281+920	281+930	6		3		10
205	281+930	281+940	6		1.5		10
206	281+940	281+950	6		1.5		10
207	281+950	281+960	6		1.5		10
208	281+960	281+970	6		1.5		10
209	281+970	281+980	6		1.5		10
210	281+980	281+990	6		1.5		10
211	281+990	282+000	6		1.5		10
212	282+000	282+010	6		1.5		10
213	282+010	282+020	6		1.5		10
214	282+020	282+030	6		1.5		10
215	282+030	282+040	6		1.5		10
216	282+040	282+050	6		1.5		10
217	282+160	282+170	6		1.5		10
218	282+170	282+180	6		3		10
219	282+180	282+190	6		3		10
220	282+190	282+200	6		3		10
221	282+200	282+210	6		3		10
222	282+210	282+220	6		3		10
223	282+220	282+230	6		3		10
224	282+230	282+240	6	1.5	3	10	10
225	282+240	282+250	2	1.5	3	10	10
226	282+250	282+260	2	3	3	10	10
227	282+260	282+270	2	3	3	10	10
228	282+270	282+280	2	3	3	10	10
229	282+280	282+290	2	3	3	10	10
230	282+290	282+300	2	3	3	10	10
231	282+300	282+310	2	3	3	10	10
232	282+310	282+320	2	3	3	10	10
233	282+320	282+330	2	3	3	10	10
234	282+330	282+340	2	3	3	10	10
235	282+340	282+350	2	3	3	10	10
236	282+350	282+360	2	3	3	10	10
237	282+360	282+370	2	3	3	10	10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
238	282+370	282+380	2	3	3	10	10
239	282+380	282+390	2	3	3	10	10
240	282+390	282+400	2	3	3	10	10
241	282+400	282+410	2	3	3	10	10
242	282+410	282+420	2	3	3	10	10
243	282+420	282+430	2	1.5	3	10	10
244	282+430	282+440	2	1.5	3	10	10
245	282+440	282+450	6	0	3	0	10
246	282+450	282+460	6	0	3	0	10
247	282+460	282+470	6		3		10
248	282+470	282+480	5		3		10
249	282+480	282+490	5		3		10
250	282+490	282+500	5		3		10
251	282+500	282+510	5		3		10
252	282+510	282+520	5		3		10
253	282+520	282+530	5		3		10
254	282+530	282+540	5		3		10
255	282+540	282+550	5		3		10
256	282+550	282+560	5		3		10
257	282+560	282+570	5		3		10
258	282+570	282+580	5		3		10
259	282+580	282+590	5		3		10
260	282+590	282+600	5		1.5		10
261	282+600	282+610	5		1.5		10
262	282+610	282+620	5		1.5		10
263	282+880	282+890	5		1.5		10
264	282+890	282+900	5		1.5		10
265	282+900	282+910	5		3		10
266	282+910	282+920	6		3		10
267	282+920	282+930	6		3		10
268	282+930	282+940	6		3		10
269	282+940	282+950	6		3		10
270	282+950	282+960	6		3		10
271	282+960	282+970	6		3		10
272	282+970	282+980	6		3		10
273	282+980	282+990	6		3		10
274	282+990	283+000	6		3		10
275	283+000	283+010	6		3		10
276	283+010	283+020	6		3		10
277	283+020	283+030	6		3		10
278	283+030	283+040	6		3		10
279	283+040	283+050	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
280	283+050	283+060	6		3		10
281	283+060	283+070	6		3		10
282	283+070	283+080	6		3		10
283	283+080	283+090	6		3		10
284	283+090	283+100	6		3		10
285	283+100	283+110	6		3		10
286	283+110	283+120	6		3		10
287	283+120	283+130	6		3		10
288	283+130	283+140	6		3		10
289	283+140	283+150	6		3		10
290	283+150	283+160	6		3		10
291	283+160	283+170	6		3		10
292	283+170	283+180	6		3		10
293	283+180	283+190	6		3		10
294	283+190	283+200	6		3		10
295	283+200	283+210	6		3		10
296	283+210	283+220	6		3		10
297	283+560	283+570	6		1.5		10
298	283+570	283+580	6		1.5		10
299	283+580	283+590	5		1.5		10
300	283+590	283+600	5		1.5		10
301	283+600	283+610	5		1.5		10
302	283+610	283+620	5		1.5		10
303	283+620	283+630	5		3		10
304	283+630	283+640	5		3		10
305	283+640	283+650	5		3		10
306	283+650	283+660	5		3		10
307	283+660	283+670	5		3		10
308	283+670	283+680	5		3		10
309	283+680	283+690	5		3		10
310	283+690	283+700	5		3		10
311	283+700	283+710	5		3		10
312	283+710	283+720	5		3		10
313	283+720	283+730	5		3		10
314	283+730	283+740	6		3		10
315	283+740	283+750	6		3		10
316	283+750	283+760	6		3		10
317	283+760	283+770	6		3		10
318	283+770	283+780	6		3		10
319	283+780	283+790	6		3		10
320	283+790	283+800	6		3		10
321	283+800	283+810	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
322	283+810	283+820	6		3		10
323	283+820	283+830	6		3		10
324	283+830	283+840	6		3		10
325	283+840	283+850	6		3		10
326	283+850	283+860	6		3		10
327	283+860	283+870	6		3		10
328	283+870	283+880	6		3		10
329	283+880	283+890	6		3		10
330	283+890	283+900	6		3		10
331	283+900	283+910	6		3		10
332	283+910	283+920	6		3		10
333	283+920	283+930	2	1.5	3	10	10
334	283+930	283+940	2	1.5	3	10	10
335	283+940	283+950	2	3	3	10	10
336	283+950	283+960	2	3	3	10	10
337	283+960	283+970	2	3	3	10	10
338	283+970	283+980	2	3	3	10	10
339	283+980	283+990	2	3	3	10	10
340	283+990	284+000	2	3	3	10	10
341	284+000	284+010	2	3	3	10	10
342	284+010	284+020	2	3	3	10	10
343	284+020	284+030	2	3	3	10	10
344	284+030	284+040	2	3	3	10	10
345	284+040	284+050	2	3	3	10	10
346	284+050	284+060	2	3	3	10	10
347	284+060	284+070	2	3	3	10	10
348	284+070	284+080	2	1.5	3	10	10
349	284+080	284+090	6		3		10
350	284+090	284+100	6		3		10
351	284+100	284+110	6		3		10
352	284+110	284+120	6		3		10
353	284+120	284+130	6		3		10
354	284+130	284+140	6		3		10
355	284+140	284+150	6		3		10
356	284+150	284+160	6		3		10
357	284+160	284+170	6		3		10
358	284+170	284+180	6		3		10
359	284+180	284+190	4		3		10
360	284+190	284+200	4		1.5		10
361	284+320	284+330	4		1.5		10
362	284+330	284+340	4		1.5		10
363	284+340	284+350	4		1.5		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
364	284+350	284+360	4		1.5		10
365	284+360	284+370	4		3		10
366	284+370	284+380	4		3		10
367	284+380	284+390	4		3		10
368	284+390	284+400	6		3		10
369	284+400	284+410	6		3		10
370	284+410	284+420	6		3		10
371	284+420	284+430	6		3		10
372	284+430	284+440	6		3		10
373	284+440	284+450	6		3		10
374	284+450	284+460	6		3		10
375	284+460	284+470	6		3		10
376	284+470	284+480	6		3		10
377	284+480	284+490	6		3		10
378	284+490	284+500	6		3		10
379	284+500	284+510	6		3		10
380	284+510	284+520	6		3		10
381	284+520	284+530	6		3		10
382	284+530	284+540	6		3		10
383	284+540	284+550	5		3		10
384	284+550	284+560	5		1.5		10
385	284+560	284+570	5		1.5		10
386	285+010	285+020	5		1.5		10
387	285+020	285+030	5		1.5		10
388	285+030	285+040	5		1.5		10
389	285+040	285+050	6		3		10
390	285+050	285+060	6		3		10
391	285+060	285+070	6		3		10
392	285+070	285+080	6		3		10
393	285+080	285+090	6		3		10
394	285+090	285+100	6		3		10
395	285+100	285+110	6		3		10
396	285+110	285+120	6		3		10
397	285+120	285+130	6		3		10
398	285+130	285+140	6		3		10
399	285+140	285+150	6		3		10
400	285+150	285+160	6		3		10
401	285+160	285+170	6		3		10
402	285+170	285+180	6		3		10
403	285+180	285+190	6		3		10
404	285+190	285+200	6		3		10
405	285+200	285+210	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
406	285+210	285+220	6		3		10
407	285+220	285+230	6		3		10
408	285+230	285+240	6		3		10
409	285+240	285+250	6		3		10
410	285+250	285+260	6		3		10
411	285+260	285+270	6		3		10
412	285+270	285+280	6		3		10
413	285+280	285+290	6		3		10
414	285+290	285+300	6		3		10
415	285+300	285+310	6		3		10
416	285+310	285+320	6		3		10
417	285+320	285+330	6		3		10
418	285+330	285+340	6		3		10
419	285+340	285+350	6		3		10
420	285+350	285+360	6		3		10
421	285+360	285+370	6		3		10
422	285+370	285+380	6		1.5		10
423	285+380	285+390	6		1.5		10
424	285+390	285+400	6		3		10
425	285+400	285+410	6		3		10
426	285+410	285+420	6		3		10
427	285+420	285+430	6		3		10
428	285+430	285+440	6		3		10
429	285+440	285+450	6		1.5		10
430	285+450	285+460	6		0		
431	285+460	285+470	6		0		
432	285+470	285+480	6		1.5		10
433	285+480	285+490	6		3		10
434	285+490	285+500	6		3		10
435	285+500	285+510	6		3		10
436	285+510	285+520	6		3		10
437	285+520	285+530	6		3		10
438	285+530	285+540	6		1.5		10
439	285+540	285+550	6		1.5		10
440	285+550	285+560	6		1.5		10
441	285+590	285+600	6		1.5		10
442	285+600	285+610	6		1.5		10
443	285+610	285+620	6		3		10
444	285+620	285+630	6		3		10
445	285+630	285+640	6		3		10
446	285+640	285+650	6		3		10
447	285+650	285+660	6		3		10

S No	Design Chainage (Km)		TCS	Breast Wall Height above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
448	285+660	285+670	4		3		10
449	285+670	285+680	4		3		10
450	285+680	285+690	4		3		10
451	285+690	285+700	4		3		10
452	285+700	285+710	4		3		10
453	285+710	285+720	4		3		10
454	285+720	285+730	4		3		10
455	285+730	285+740	4		3		10
456	285+740	285+750	4		3		10
457	285+750	285+760	4		3		10
458	285+760	285+770	4 to 9		3		10
459	285+770	285+780	4 to 9		1.5		10
460	285+780	285+790	4 to 9		1.5		10
461	285+790	285+800	4 to 9		1.5		10
462	285+800	285+810	4 to 9		1.5		10

2. Toe/Retaining wall:

Retaining walls shall be designed considering appropriate height as per site condition. The PCC walls have been adopted upto the height of 2m from the ground level and RCC retaining walls for height more than 2m. The proposal shall be got approved from the Authority Engineer. The minimum length and height details of Toe Wall are as below:

The details of Toe Wall are as below:

S No	Design Chainage (Km)		TCS Type	Toe wall height above GL (m)		Length (m)	
	From	To		LHS	RHS	LHS	RHS
1	274+610	274+620	7	1.229	0.733	10	10
2	274+620	274+630	7	1.622	0.949	10	10
3	274+630	274+640	8	1.528		10	
4	274+640	274+650	8	1.448		10	
5	274+650	274+660	8	1.663		10	
6	274+660	274+670	8	1.563		10	
7	274+670	274+680	8	1.49		10	
8	274+680	274+690	8	1.311		10	
9	274+690	274+700	8	1.66		10	
10	274+700	274+710	8	1.304		10	
11	274+710	274+720	8	1.567		10	

S No	Design Chainage (Km)		TCS Type	Toe wall height above GL (m)		Length (m)	
	From	To		LHS	RHS	LHS	RHS
12	274+720	274+730	8	1.71		10	
13	274+730	274+740	8	1.496		10	
14	274+740	274+750	8	1.093		10	
15	274+750	274+760	8	1.371		10	
16	274+760	274+770	8	1.261		10	
17	274+770	274+780	8	1.126		10	
18	274+780	274+790	8	1.148		10	
19	274+790	274+800	8	1.197		10	
20	275+180	275+190	5	0.562		10	
21	275+190	275+200	5	0.847		10	
22	275+200	275+210	5	0.839		10	
23	275+210	275+220	5	1.744		10	
24	275+400	275+410	4	0.633		10	
25	275+490	275+500	4	1.068		10	
26	275+800	275+810	8	1.661		10	
27	275+870	275+880	8	1.777		10	
28	275+880	275+890	8	1.254		10	
29	275+890	275+900	8	0.69		10	
30	276+520	276+530	5	1.573		10	
31	276+530	276+540	5	0.885		10	
32	276+540	276+550	5	1.754		10	
33	276+590	276+600	5	1.777		10	
34	276+600	276+610	5	1.663		10	
35	276+610	276+620	5	1.035		10	
36	276+620	276+630	5	0.597		10	
37	278+170	278+180	8		0.223		10
38	278+180	278+190	8		0.51		10
39	278+190	278+200	8		0.797		10
40	278+200	278+210	8		1.174		10
41	278+210	278+220	8		1.618		10
42	278+220	278+230	7	0.222		10	
43	278+260	278+270	7	1.895		10	
44	278+270	278+280	7	1.387		10	
45	278+280	278+290	7	0.893		10	
46	278+320	278+330	8		0.945		10

S No	Design Chainage (Km)		TCS Type	Toe wall height above GL (m)		Length (m)	
	From	To		LHS	RHS	LHS	RHS
47	280+150	280+160	10	0.276		10	
48	280+160	280+170	10	1.251		10	
49	280+170	280+180	10	0.472		10	
50	280+180	280+190	10	0.824		10	
51	280+190	280+200	10	0.498		10	
52	281+720	281+730	8		0.39		10
53	281+730	281+740	8		0.785		10
54	281+740	281+750	8		0.968		10
55	281+750	281+760	8		1.098		10
56	281+760	281+770	8		1.09		10
57	281+770	281+780	8		1.23		10
58	281+780	281+790	8		1.901		10
59	282+470	282+480	5	1.647		10	
60	282+480	282+490	5	1.757		10	
61	282+490	282+500	5	1.953		10	
62	283+260	283+270	8	0.506		10	
63	283+270	283+280	8	0.578		10	
64	283+280	283+290	8	0.643		10	
65	283+290	283+300	8	0.702		10	
66	283+300	283+310	8	0.406		10	
67	283+310	283+320	8	0.185		10	
68	283+470	283+480	8	0.807		10	
69	283+480	283+490	8	1.598		10	
70	283+490	283+500	8	1.382		10	
71	283+500	283+510	8	0.892		10	
72	283+510	283+520	8	0.401		10	
73	283+580	283+590	5	0.386		10	
74	283+590	283+600	5	1.228		10	
75	283+600	283+610	5	1.105		10	
76	283+610	283+620	5	0.509		10	
77	283+620	283+630	5	0.296		10	
78	283+630	283+640	5	0.358		10	
79	283+640	283+650	5	0.517		10	
80	283+650	283+660	5	0.733		10	
81	283+660	283+670	5	0.872		10	
82	283+670	283+680	5	0.952		10	
83	283+680	283+690	5	0.922		10	

S No	Design Chainage (Km)		TCS Type	Toe wall height above GL (m)		Length (m)	
	From	To		LHS	RHS	LHS	RHS
84	283+690	283+700	5	0.831		10	
85	283+700	283+710	5	0.669		10	
86	283+710	283+720	5	0.434		10	
87	283+720	283+730	5	0.194		10	
88	284+190	284+200	4	0.308		10	
89	284+200	284+210	4	0.463		10	
90	284+210	284+220	4	0.672		10	
91	284+220	284+230	4	1.699		10	
92	284+370	284+380	4	1.795		10	
93	284+380	284+390	4	0.926		10	
94	284+540	284+550	5	0.65		10	
95	284+550	284+560	5	1.03		10	
96	284+560	284+570	5	0.347		10	
97	284+790	284+800	8	0.767		10	
98	284+800	284+810	8	1.673		10	
99	285+030	285+040	5	1.047		10	
100	285+670	285+680	4	0.432		10	
101	285+680	285+690	4	1.152		10	
102	285+750	285+760	4	1.766		10	
103	285+820	285+830	10	0.5		10	
104	285+830	285+840	10	0.5		10	
105	285+840	285+850	10	0.637		10	
106	285+850	285+860	10	1.511		10	
107	285+900	285+910	10	0.801		10	
108	286+940	286+950	10 to 8	0.328		10	
109	286+950	286+960	10 to 8	0.442		10	
110	286+960	286+970	10 to 8	0.556		10	
111	286+970	286+980	10 to 8	0.569		10	
112	286+980	286+990	10 to 8	0.761		10	
113	286+990	287+000	10 to 8	0.959		10	

The details of Retaining Walls are as below:

S No	Design Chainage (Km)		TCS Type	Retaining Wall (m) above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
1	275+410	275+420	4	2.025		10	
2	275+420	275+430	4	2.964		10	
3	275+430	275+440	4	3.421		10	
4	275+440	275+450	4	4.035		10	
5	275+450	275+460	4	3.707		10	
6	275+460	275+470	4	3.462		10	
7	275+470	275+480	4	3.86		10	
8	275+480	275+490	4	2.525		10	
9	275+810	275+820	8	2.197		10	
10	275+820	275+830	8	2.616		10	
11	275+830	275+840	8	2.501		10	
12	275+840	275+850	8	2.512		10	
13	275+850	275+860	8	2.569		10	
14	275+860	275+870	8	2.654		10	
15	276+510	276+520	5	2.323		10	
16	276+550	276+560	5	2.514		10	
17	276+560	276+570	5	3.438		10	
18	276+570	276+580	5	3.046		10	
19	276+580	276+590	5	2.404		10	
20	278+220	278+230	7		2.065		10
21	278+230	278+240	7	2.226	2.497	10	10
22	278+240	278+250	7	2.925	2.427	10	10
23	278+250	278+260	7	2.415	2.384	10	10
24	278+260	278+270	7		2.46		10
25	278+270	278+280	7		3.375		10
26	278+280	278+290	7		3.079		10
27	278+290	278+300	8		2.885		10
28	278+300	278+310	8		2.704		10
29	278+310	278+320	8		2.144		10
30	281+790	281+800	8		2.77		10
31	281+800	281+808	8		2.198		8
32	282+500	282+510	5	2.125		10	
33	282+510	282+520	5	2.242		10	
34	282+520	282+530	5	2.353		10	
35	282+530	282+540	5	2.458		10	
36	282+540	282+550	5	2.714		10	

S No	Design Chainage (Km)		TCS Type	Retaining Wall (m) above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
37	282+550	282+560	5	2.938		10	
38	282+560	282+570	5	3.089		10	
39	282+570	282+580	5	3.395		10	
40	282+580	282+590	5	4.206		10	
41	282+590	282+600	5	4.942		10	
42	282+600	282+610	5	5.672		10	
43	282+610	282+620	5	5.745		10	
44	282+620	282+630	5	5.894		10	
45	282+630	282+640	8	5.898		10	
46	282+640	282+650	8	6.563		10	
47	282+650	282+660	8	6.576		10	
48	282+660	282+670	8	6.561		10	
49	282+670	282+680	8	7.002		10	
50	282+680	282+690	8	7.421		10	
51	282+690	282+700	8	8.175		10	
52	282+700	282+710	8	8.686		10	
53	282+710	282+720	8	8.555		10	
54	282+720	282+730	8	8.55		10	
55	282+730	282+740	8	8.683		10	
56	282+740	282+750	8	8.877		10	
57	282+750	282+760	8	8.86		10	
58	282+760	282+770	8	8.712		10	
59	282+770	282+780	8	8.682		10	
60	282+780	282+790	8	8.724		10	
61	282+790	282+800	8	8.834		10	
62	282+800	282+810	8	9.012		10	
63	282+810	282+820	8	10.11		10	
64	282+820	282+830	8	9.561		10	
65	282+830	282+840	8	8.369		10	
66	282+840	282+850	8	6.749		10	
67	282+850	282+860	8	4.838		10	
68	282+860	282+870	8	4.182		10	
69	282+870	282+880	8	3.62		10	
70	282+880	282+890	5	3.273		10	
71	282+890	282+900	5	3.051		10	
72	282+900	282+910	5	2.274		10	
73	284+230	284+240	4	2.791		10	
74	284+240	284+250	4	2.756		10	
75	284+250	284+260	4	2.867		10	
76	284+260	284+270	4	2.987		10	
77	284+270	284+280	4	3.527		10	
78	284+280	284+290	4	3.417		10	

S No	Design Chainage (Km)		TCS Type	Retaining Wall (m) above GL		Length (m)	
	From	To		LHS	RHS	LHS	RHS
79	284+290	284+300	4	2.846		10	
80	284+300	284+310	4	3.269		10	
81	284+310	284+320	4	3.781		10	
82	284+320	284+330	4	3.935		10	
83	284+330	284+340	4	3.928		10	
84	284+340	284+350	4	3.997		10	
85	284+350	284+360	4	3.252		10	
86	284+360	284+370	4	2.591		10	
87	284+810	284+820	8	2.107		10	
88	284+820	284+830	8	2.095		10	
89	284+830	284+840	8	2.069		10	
90	284+840	284+850	8	2.359		10	
91	284+850	284+860	8	2.616		10	
92	284+860	284+870	8	2.738		10	
93	284+870	284+880	8	2.785		10	
94	284+880	284+890	8	2.866		10	
95	284+890	284+900	8	2.93		10	
96	284+900	284+910	8	3.03		10	
97	284+910	284+920	8	3.21		10	
98	284+920	284+930	8	3.402		10	
99	284+930	284+940	8	3.568		10	
100	284+940	284+950	8	3.732		10	
101	284+950	284+960	8	3.824		10	
102	284+960	284+970	8	3.882		10	
103	284+970	284+980	8	3.759		10	
104	284+980	284+990	8	3.71		10	
105	284+990	285+000	8	3.863		10	
106	285+000	285+010	8	3.984		10	
107	285+010	285+020	5	3.488		10	
108	285+020	285+030	5	2.599		10	
109	285+690	285+700	4	2.001		10	
110	285+700	285+710	4	2.89		10	
111	285+710	285+720	4	3.463		10	
112	285+720	285+730	4	3.045		10	
113	285+730	285+740	4	2.74		10	
114	285+740	285+750	4	2.186		10	
115	285+860	285+870	10	2.303		10	
116	285+870	285+880	10	2.877		10	
117	285+880	285+890	10	2.74		10	
118	285+890	285+900	10	2.46		10	

Note: The above mentioned retaining wall locations are tentative and total length given is minimum. Additional length if required shall be provided as per site conditions. Also, Toe/Retaining walls at toe to be provided to accommodate the cross section within the available RoW whenever required.

3. Stone Pitching

The Stone pitching has been adopted to protect the erosion of embankment side slope where the river stream are very close and may damage the side slope. The minimum locations on the project highway are as below:

Sl. No.	Design Chainage (Km)		Side	Length (m)	Avg. Height (m)
	From	To			
1	275+300	275+400	LHS	100	1.52
2	275+400	275+500	LHS	100	4.00
3	284+180	284+390	LHS	210	4.00
4	285+660	285+760	LHS	100	4.00

4. Surficial Protection and Erosion Control Measures (Cut Height of Side Slope >25m)

The Hill side surficial protection and erosion control measures is proposed at locations where the cut height of side slope is more than 25m.

The minimum details of locations with length and average height are as below and may be finalized in consultation with the Authority Engineer.

S No	Design Chainage (Km)		Length (m)	Average Height (m)
	From	To		
Nil				

Hill side Typical Surficial Protection and Erosion Control Measures for cut height of side slope more than 25m are presented in Appendix-1 of this Schedule B and described below:

(a) Hill side Toe Gabion wall for Isolated Soil Strata - Mechanically woven Zn+10%Al with PVC coated steel wire mesh gabion toe wall with minimum height of wall 3.0 m shall be constructed for the locations wherever soil strata is encountered after cutting at the toe of hill side slope. Gabion toe wall shall be constructed along with non-woven geotextile behind the gabion for filtration & separation and road edge drain.

(b) Surficial Protection for Rocky Strata -Continuously threaded anchors shall be installed wherever rocky strata are encountered on the slope. Surficial protection with secured drapery system shall be done for full length and height of cut slope surface developed by cutting the rock with slope angle of 80 degree with horizontal after excavation, wherever rocky strata is encountered. Surface protection for rocky strata shall be done by high resistance double twisted hexagonal Zn+5%Al coated wire mesh with top, bottom and surface continuously threaded anchors. Top, bottom and surface anchors shall have minimum length and minimum diameter as 3.0 m and 25 mm respectively. Top and bottom anchors shall be provided at a maximum spacing of 1.5 m and 3.0 m c/c in longitudinal direction respectively. Surface anchors shall be provided with maximum spacing of 3 m c/c in longitudinal and vertical directions for total area. All rock anchors shall be fully grouted. Minimum yield strength of anchorages shall be 500 MPa.

(c) Erosion Control Measures for Soil Surface - Self drilling anchors shall be installed wherever collapsible strata is encountered on the slope. Erosion control measures shall be adopted for cut slope wherever soil strata is encountered at the surface and slope angle shall be limited to 45 degrees or flatter with horizontal after the excavation upto proposed right of way. Three dimensional reinforced synthetic geomat shall be used for erosion control measures along with hydraulically applied erosion control measures. Self Drilling Anchors shall be used for supporting geomat along with u-pins. Minimum length and outer diameter of self drilling anchors shall be 1 m and 32 mm respectively. Self drilling anchors shall be provided with maximum spacing of 3 m c/c in longitudinal and vertical directions.

(d) Drainage Measures for Cut Slopes - Drainage measures for internal seepage in the cut slope shall be adopted by installing PVC pipes inside the slope. PVC pipes for internal seepage shall be half perforated and lined with geotextile. PVC pipes shall be installed for minimum 4 m length at spacing of 4 m c/c in longitudinal direction in minimum 4 layers at the bottom of the cut slope. Top drain shall also be constructed at the toe wherever soil strata is encountered after rocky strata. In addition to the above mentioned drainage measures, suitable surface drainage measures shall be adopted as per the site condition.

8. Traffic Control Devices and Road Safety Works

Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual.

Traffic signs, Pavement marking and Safety barriers

a) Traffic Signs:

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway as per section 9 of Manual.

b) Pavement marking:

Pavement markings shall cover road marking for the entire Project Highway as per section 9 of Manual

c) Safety Barrier:

Provide W-beam crash barrier, and parapet walls along the project highway as suggested in the section 9 of Manual.

Specifications of the Reflective Sheeting

The prismatic Reflective sheeting shall be provided in accordance with the para 9.2.3 of the Manual.

9. Roadside Furniture

a. Roadside furniture shall be provided in accordance with the provisions of Section 9and 12 of the Manual and as given in Schedule-C.

b. Overhead traffic signs: location and size

Overhead traffic signs are provided as per site requirement according to paragraph 9.2.5 of the Manual and as given in Schedule-C.
Major Road Junctions

a) Delineators: Delineators for the entire Project Highway

10. Compulsory Afforestation

NIL

11. Hazardous Locations

The hazardous locations those require safety barriers are the locations such as Road Side obstacles, Sharp Curves, Bridge approaches and any other locations identified in consultation with Authority Engineer during the execution of project highway.

(a) The safety barriers shall be provided on both side of curves with radius upto 450 m as per clause 9.7.1 of Manual at the following hazardous location on:

S No	Design Chainage		Length	Remark (Curve Radius)
	Start	End		
Inner edge				
16	276+216	276+410	194	-360
17	276+423	276+655	232	400
18	283+606	283+997	391	360
19	284+029	284+421	392	-360

LEFT Side Outer Edge				RIGHT Side Outer Edge			
S No	CHAINAGE		Length	S No	CHAINAGE		Length
	Start	End			Start	End	
1	276+423	276+510	87	1	276+216	276+410	194
2	276+640	276+655	15	2	284+029	284+421	392
3	283+800	283+997	197				

12. Special Requirement for Hill Roads

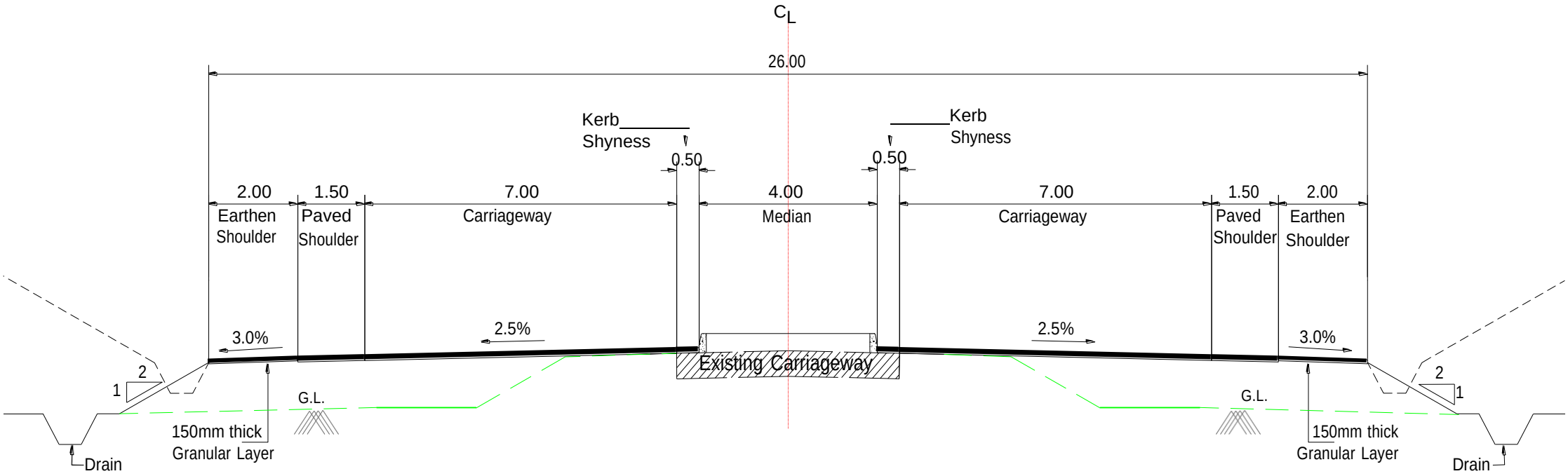
In accordance with the Section 13 of the Manual and recommended practices for treatment of Embankment and road side slope erosion control.

13. Change of Scope

The length of Structures and bridges specified hereinabove 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

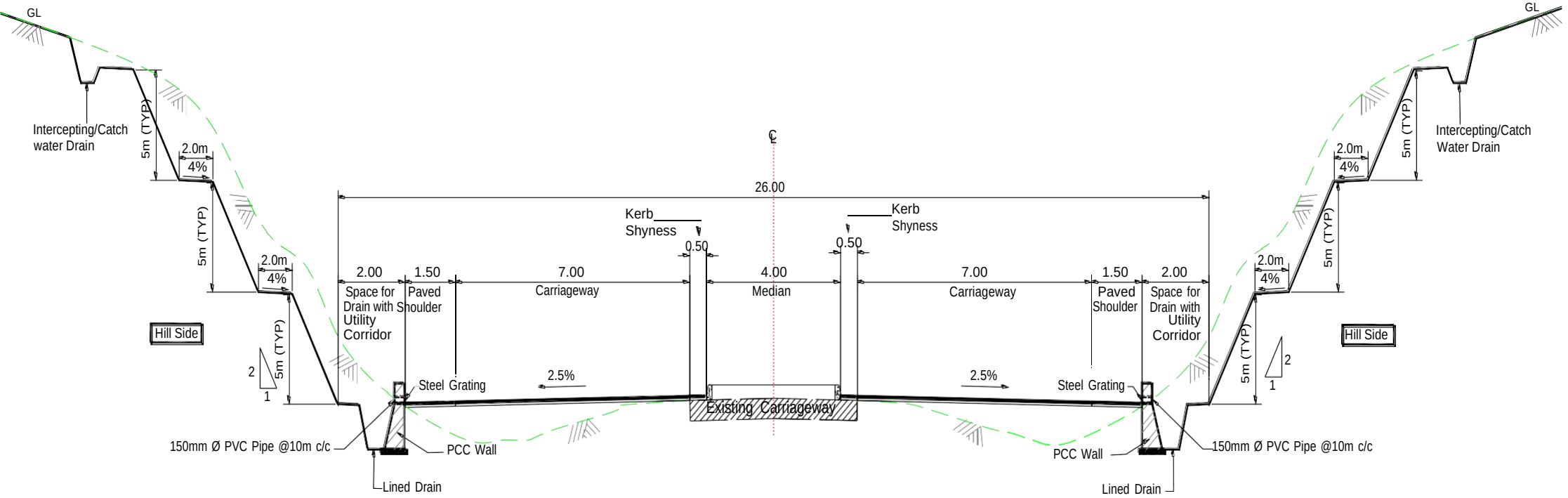
13. Change of Scope

Appendix B1 - Typical Cross Sections

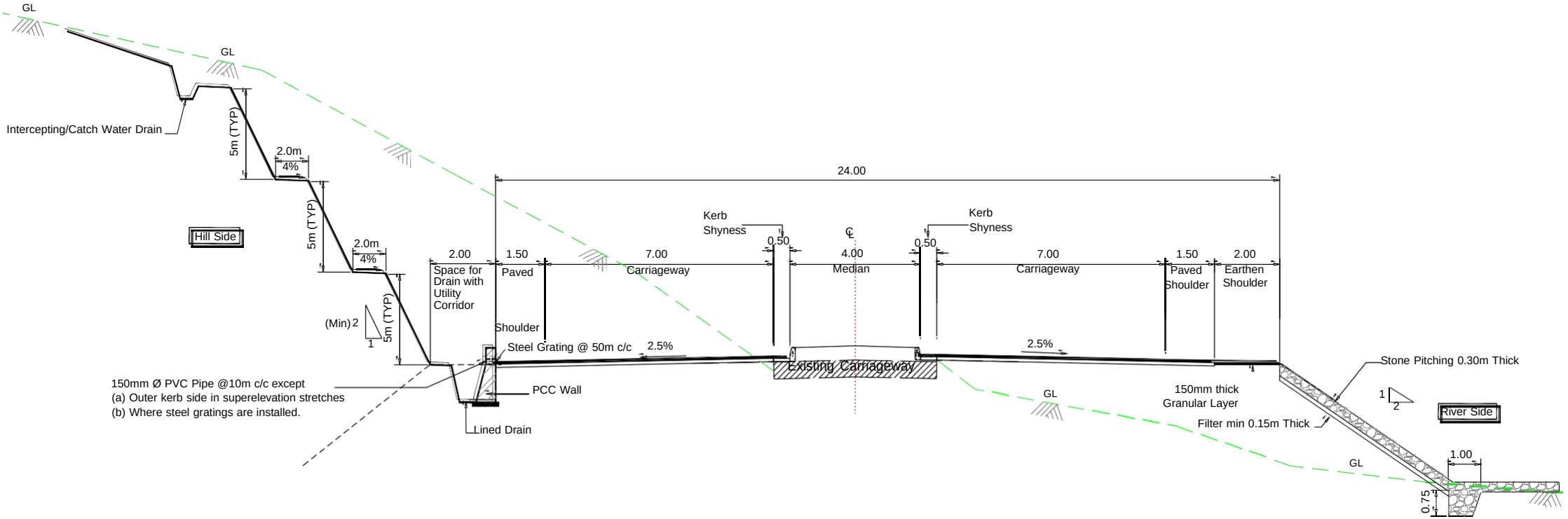


TCS-1 : 4-Lane Divided Carriageway With Raised Media

(Normal Fill/Cut Section– Rural Section)

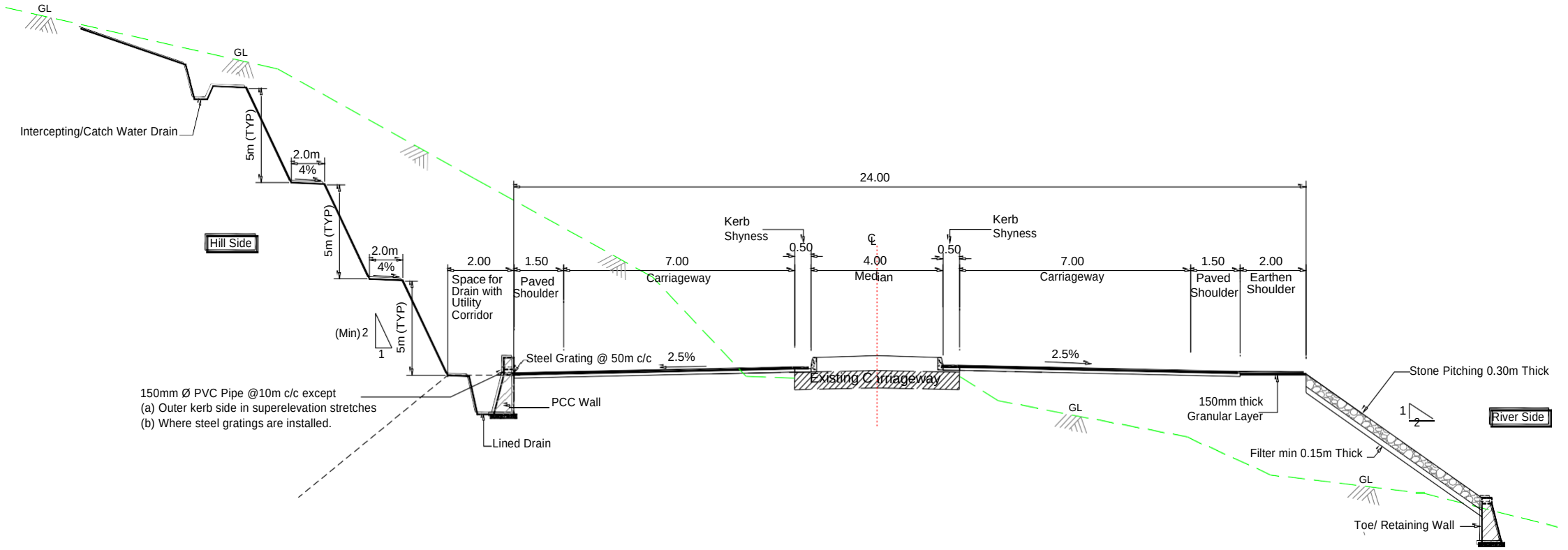


TCS-2 : 4-Lane Divided Carriageway with Both-side Hill Cutting



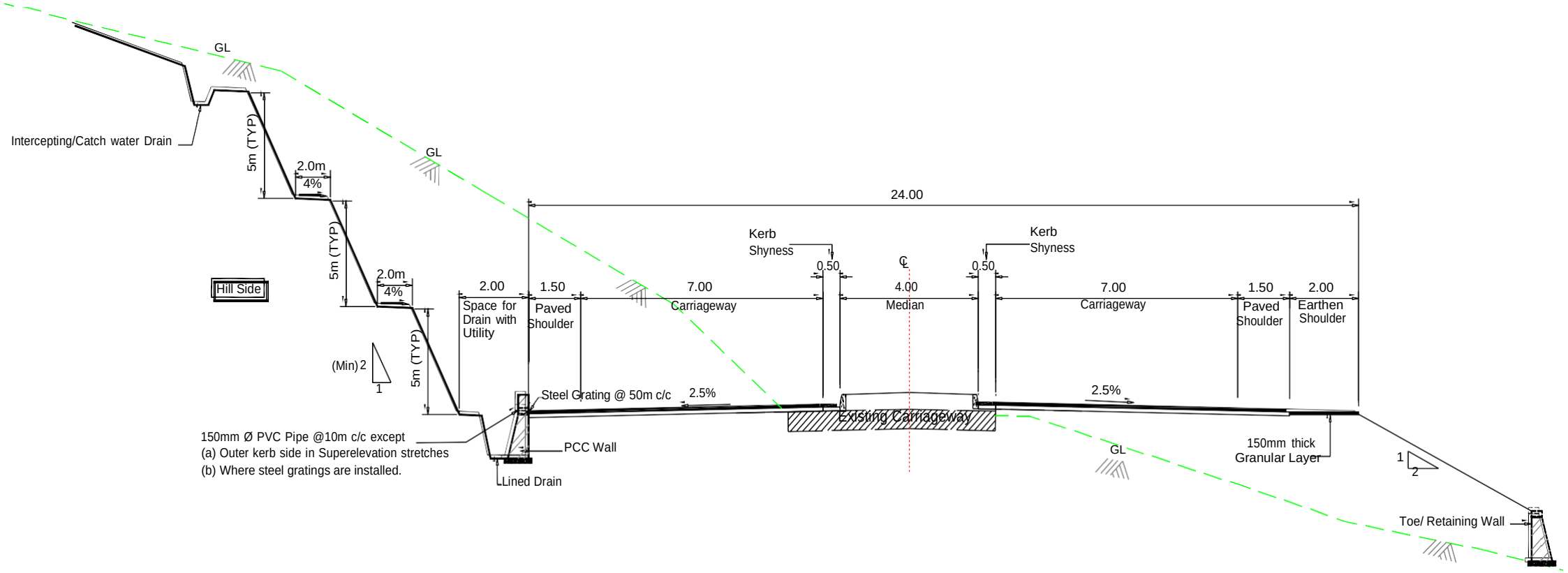
TCS-3 :4-Lane Divided Carriageway

(Hill Side Cutting / Fill and River Side Stone Pitching)



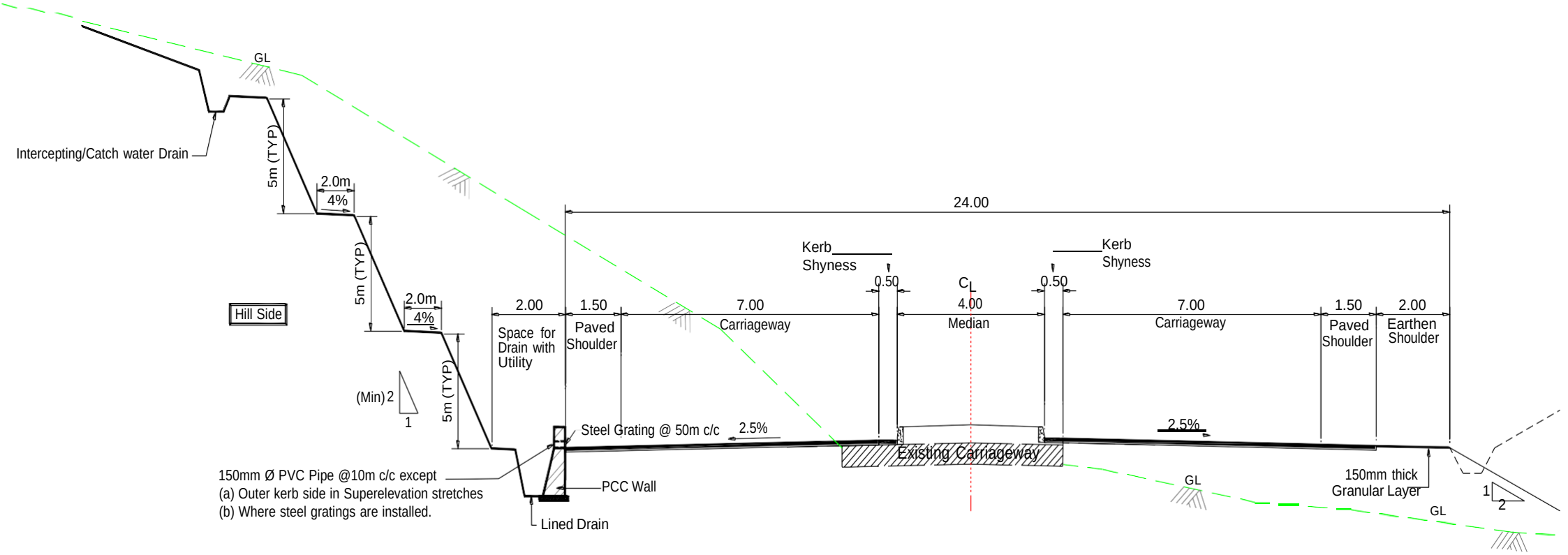
TCS-4 : 4-Lane Divided Carriageway

(Hill Side Cutting / Fill and River Side Stone Pitching with Toe/Retaining Wall)



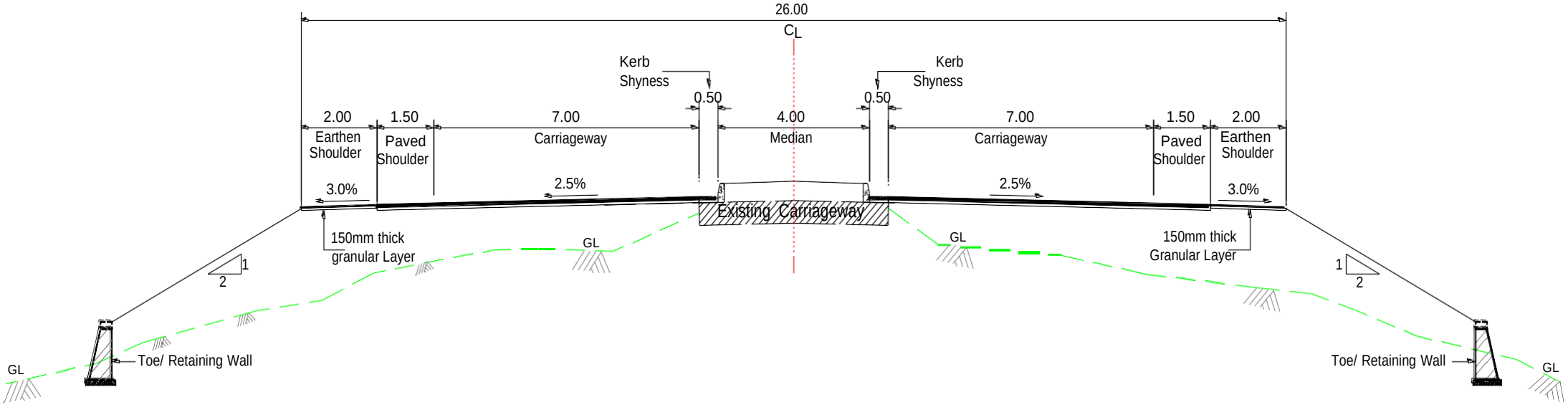
TCS-5 : 4-Lane Divided Carriageway

(One Side Hill Cutting and Other Side Toe/Retaining Wall)

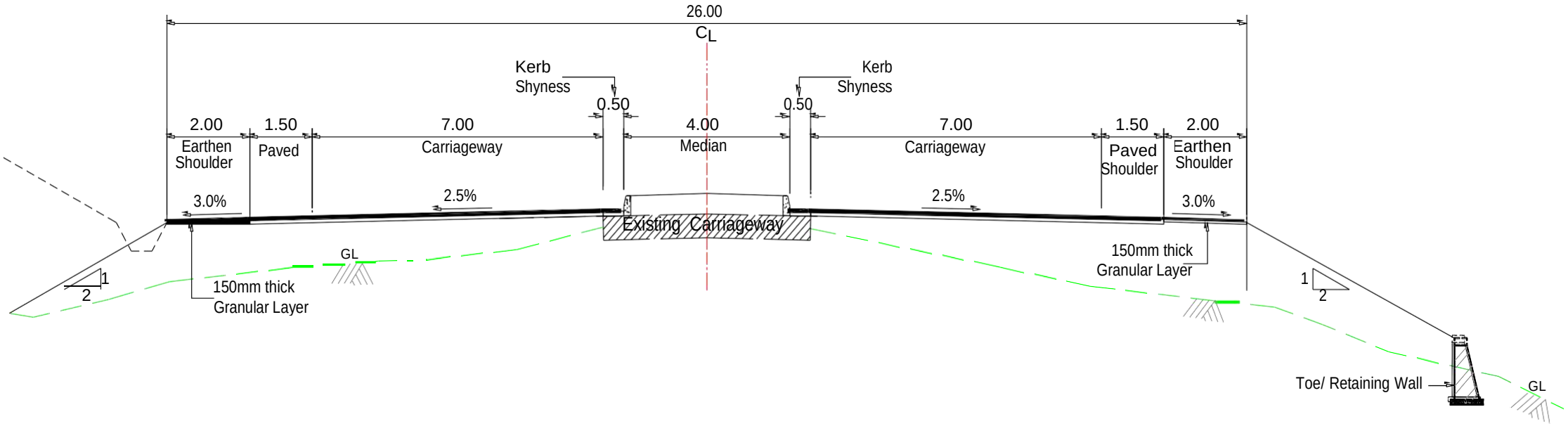


TCS-6 : 4-Lane Divided Carriageway

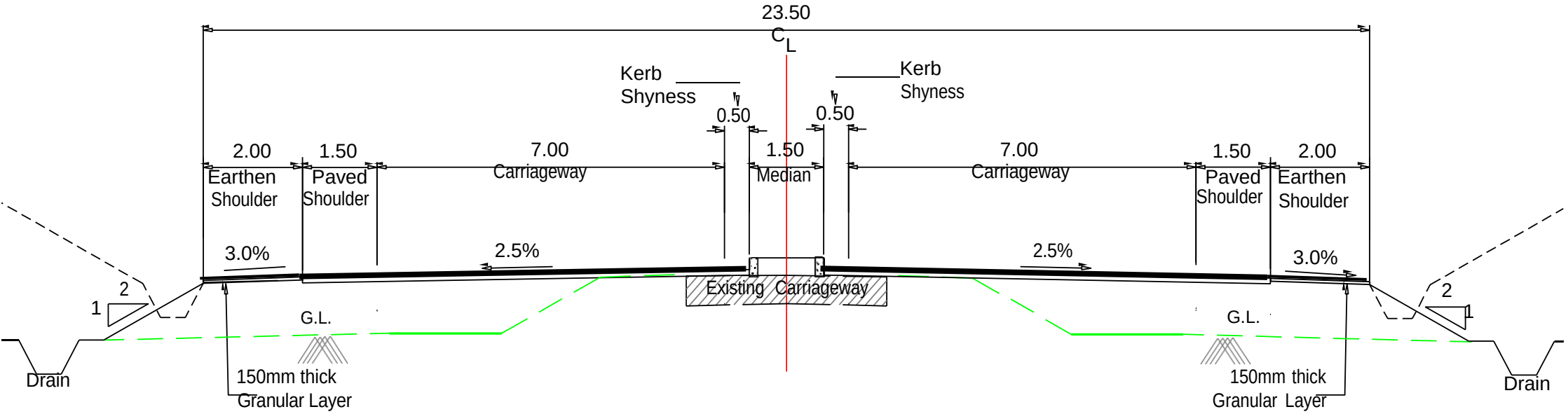
(One Side Hill Cutting and Other Side normal Cut/Fill Section)



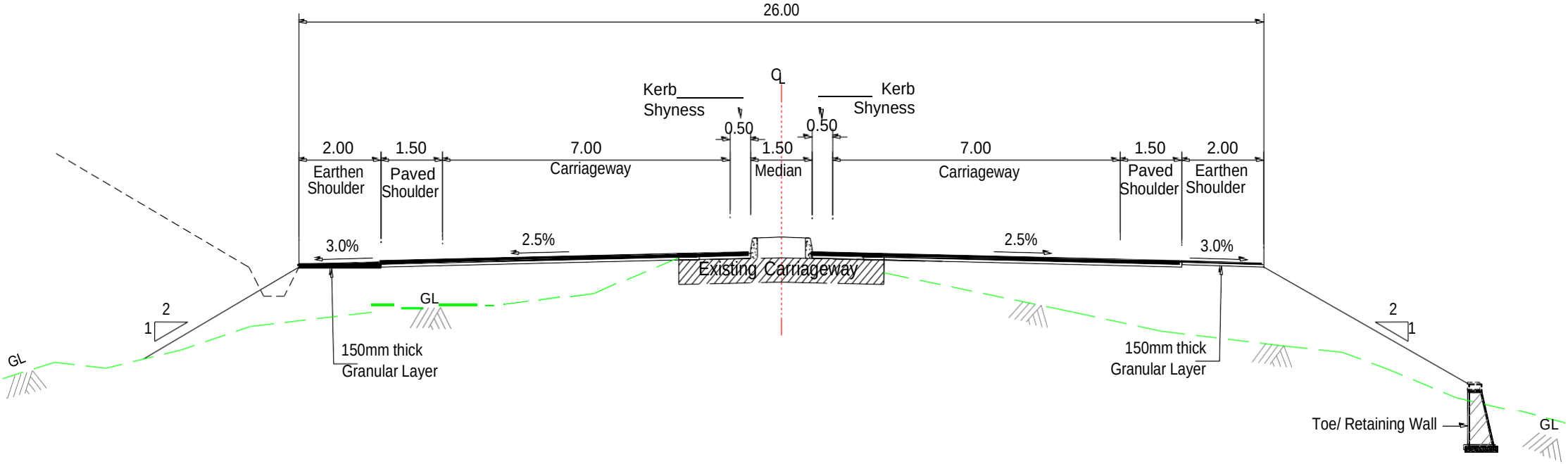
TCS-7 : 4-Lane Divided Carriageway with Bothside Toe/Retaining Walls



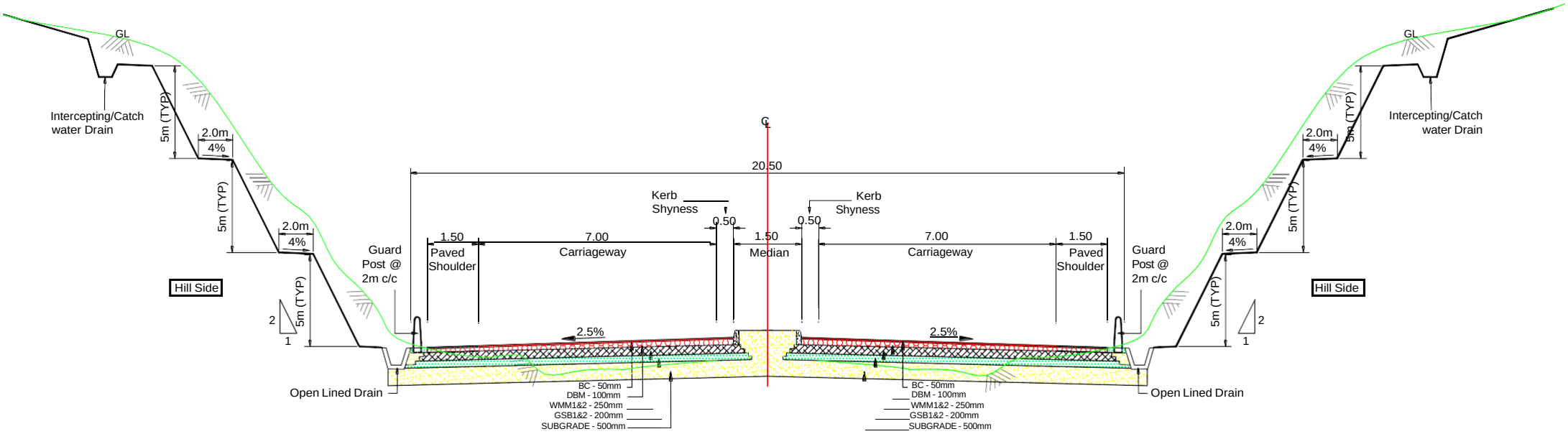
TCS-8 : 4-Lane Divided Carriageway
(One Side Retaining Wall and Other Side normal Cut/Fill Section)



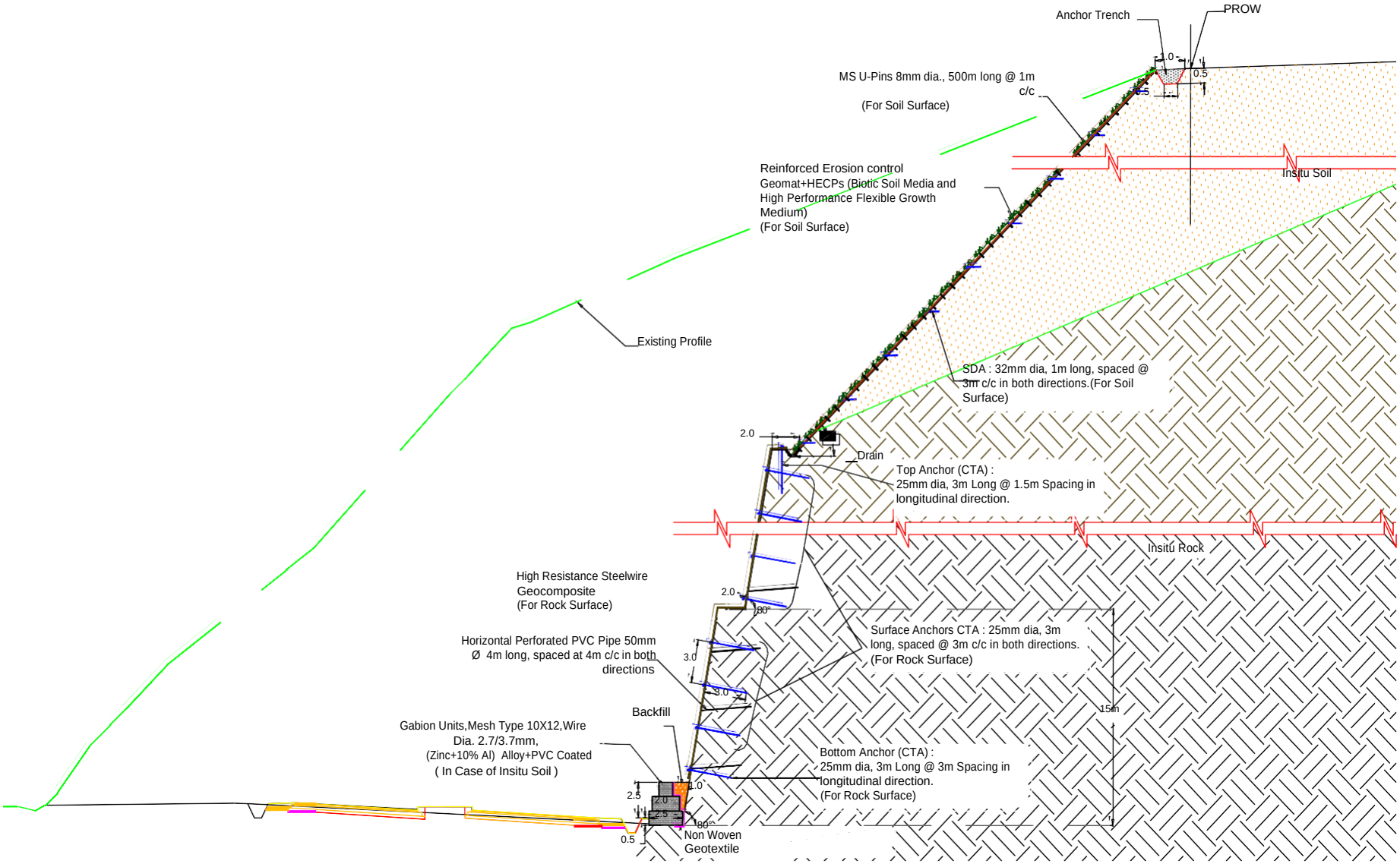
TCS-9 : 4-Lane Divided Carriageway With Cut/Fill
(Semi Built up Area)



TCS-10 : 4-Lane Divided Carriageway
(One Side Retaining Wall and Other Side normal Cut/Fill Section)



TCS-13 : 4-Lane Divided Carriageway **with Both-side Hill Cutting**
(1.50m median width)



Typical Surficial Protection and Erosion Control Measures (Cut Height of Side Slope > 25m)

Applicable Stretches of Typical Cross-section

S No	DESIGN CHAINAGE (Km)		Length	TCS Type
	From	To	(m)	
1	274+610	274+630	20	7
2	274+630	274+800	170	8
3	274+800	275+180	380	6
4	275+180	275+220	40	5
5	275+220	275+300	80	6
6	275+300	275+400	100	3
7	275+400	275+500	100	4
8	275+500	275+760	260	6
9	275+760	275+800	40	1
10	275+800	275+900	100	8
11	275+900	275+960	60	1
12	275+960	276+510	550	6
13	276+510	276+630	120	5
14	276+630	277+010	380	1
15	277+010	277+050	40	8
16	277+050	277+160	110	7
17	277+160	277+210	50	1
18	277+210	277+270	60	2
19	277+270	277+645	375	1
20	277+645	277+665	20	BRG
21	277+665	277+880	215	1
22	277+880	278+130	250	2
23	278+130	278+170	40	1
24	278+170	278+220	50	8
25	278+220	278+290	70	7
26	278+290	278+330	40	8
27	278+330	278+400	70	1
28	278+400	278+500	100	1 to 9
29	278+500	279+635	1135	9
30	279+635	279+652	17	BRG
31	279+652	279+730	78	9
32	279+730	279+790	60	13
33	279+790	280+150	360	9
34	280+150	280+200	50	10
35	280+200	280+230	30	10 to 1
36	280+230	280+300	70	9 to 1
37	280+300	281+720	1420	1
38	281+720	281+808	88	8
39	281+808	281+835	27	BRG
40	281+835	281+880	45	1
41	281+880	282+090	210	6
42	282+090	282+150	60	1

S No	DESIGN CHAINAGE (Km)		Length	TCS Type
	From	To	(m)	
43	282+150	282+240	90	6
44	282+240	282+440	200	2
45	282+440	282+470	30	6
46	282+470	282+630	160	5
47	282+630	282+880	250	8
48	282+880	282+910	30	5
49	282+910	283+220	310	6
50	283+220	283+260	40	1
51	283+260	283+320	60	8
52	283+320	283+470	150	1
53	283+470	283+520	50	8
54	283+520	283+580	60	6
55	283+580	283+730	150	5
56	283+730	283+920	190	6
57	283+920	284+080	160	2
58	284+080	284+180	100	6
59	284+180	284+390	210	4
60	284+390	284+540	150	6
61	284+540	284+570	30	5
62	284+570	284+604	34	1
63	284+604	284+610	6	BRG
64	284+610	284+790	180	1
65	284+790	285+010	220	8
66	285+010	285+040	30	5
67	285+040	285+443	403	6
68	285+443	285+458	15	BRG
69	285+458	285+560	102	6
70	285+560	285+590	30	1
71	285+590	285+660	70	6
72	285+660	285+760	100	4
73	285+760	285+820	60	4 to 9
74	285+820	285+910	90	10
75	285+910	286+798	888	9
76	286+798	286+810	12	BRG
77	286+810	286+900	90	9
78	286+900	286+940	40	9 to 1
79	286+940	287+000	60	10 to 8

Total Length (m) of each TCS:		
TCS-1	3189	4 Lane Divided Carriageway with 4m Raised Median- Normal Cut/Fill section in Rural Section
TCS-2	670	4 Lane Divided Carriageway with 4m Raised Median- Both side Hill Cutting with PCC Toe wall cum lined drain
TCS-3	100	4 Lane Divided Carriageway with 4m Raised Median- Hill side Cutting/Normal Filling and River side Stone Pitching on Embankment
TCS-4	410	4 Lane Divided Carriageway with 4m Raised Median- Hill side Cutting/Normal Filling and River side Stone Pitching on Embankment with Toe/Retaining wall
TCS-5	560	4 Lane Divided Carriageway with 4m Raised Median- One side Hill Cutting with PCC Toe wall cum lined drain and other side Toe/ Retaining wall
TCS-6	2985	4 Lane Divided Carriageway with 4m Raised Median- One side Hill Cutting with PCC Toe wall cum lined drain and other side Normal Cut/Fill
TCS-7	200	4 Lane Divided Carriageway with 4m Raised Median- Both side Toe/Retaining walls
TCS-8	1068	4 Lane Divided Carriageway with 4m Raised Median- One side Normal Cut/Fill and other side Toe/Retaining wall
TCS-9	2551	4 Lane Divided Carriageway with 1.5m Raised Median- Normal Cut/Fill section in Semi Built up Area
TCS-10	140	4 Lane Divided Carriageway with 1.5m Raised Median- One side Normal Cut/Fill section and other side Toe/Retaining wall in Semi Built up Area
TCS-13	60	4 Lane Divided Carriageway with 1.5m Raised Median- with Both-side Hill Cutting
Varies	360	
Bridges	97	Bridge Section as per GAD

(Schedule B-1)

(Schedule B-1)

The details of utilities are as follows:

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and Specification of concern Utility Owning Departments is a part of scope of work for the Contractor/Concessionaire. The bidder may visit the site and assess the quantum of shifting of utilities for the project before submission of the bid. The specifications of concerned Utility Owning Department shall be applicable and followed.

Note-The details are given in utility shifting plan in Schedule - A. The actual 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 specified in this Schedule B shall not constitute a Change of Scope.

(i) Any Other Line

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

(b) The supervision charges at the rates/charges applicable between implementing agencies of MoRTH and utility owning department shall be paid directly by the Authority to the Utility Owning Entity as and when Contractor furnishing a demand of Utility Owning Department along with a copy of sanctioned estimate.

(c) The credit of dismantled materials has been accounted for in the estimated cost. 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. If the Contractor is forced to deposit the dismantled material to utility owning department then the amount of credit for dismantled material indicated in the sanctioned estimates of utility owning department will be reimbursed to the Contractor after submitting the duly authenticated receipt of the dismantled material from utility owning department to the Authority.

(d) The utilities shall be handed over after shifting work is completed to Utility Owning

Department up 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.

(e) No change of scope shall be paid for any over-ground utilities. However, for any underground utilities not mentioned in Schedule B shall form change of scope, which shall be worked out as per the estimation of the concerned utility owning dept. and shall be payable to the contractor accordingly.

Annex – I

SCHEDULE - C

PROJECT FACILITIES

1. Project Facilities

The Contractor shall construct the Project Facilities described in this Annex-I to form part of the Two Lane with Paved Shoulders Project Highway. Such Project Facilities shall include:

(a) Toll Plaza

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Tree plantation;

(e) Truck lay-byes;

(f) Bus-bays and bus shelters;

(g) Median Opening

(h) Utility duct

(i) Others to be specified

1. Operational and maintenance base camp
2. Utilities

2. Description of Project Facilities

Each of the Project Facilities is described below:

a) Roadside furniture

The roadside furniture shall include the provision of the;

i. Traffic Signs

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway as per manual recommended in Schedule D. locations of the sign boards shall be finalized with the consultation of Authority Engineer.

ii. Pavement Markings

Pavement markings shall cover road marking for the entire Project Highway as per the manual recommended in Schedule D. locations of the sign boards shall be finalized with the consultation of Authority Engineer.

iii. LED Traffic Blinkers

For all **Pedestrian** cross walks along the alignment, at all Major Junction locations and at Curve locations where curve radius not confirming to minimum radius as per design standards and any other locations specified in relevant manual recommended in Schedule D.

iv. Crash barrier

Provide W-beam Steel crash barrier along the Project Highway at the locations as suggested in the manual recommended in Schedule D.

No W-Beam Steel crash barrier is required where already masonry/ concrete parapet wall is provisioned.

v. Delineators

Delineators for the entire project highway at the locations as recommend in relevant IRC Manual (mentioned in Schedule D) or as directed by Authority's Engineer shall be provided.

vi. Boundary stones

For the entire project highway as recommend in relevant IRC Manual (mentioned in Schedule D) shall be provided.

vii. Hectometer/Kilometer stones

For the entire project highway as recommend in relevant IRC Manual (mentioned in Schedule D) shall be provided

b) Pedestrian Facilities

i. Pedestrian Guard Rail: Provide pedestrian guard rail at each bus stop location, shall be provided.

ii. Additional Pedestrian facilities shall be provided at vulnerable locations as per specifications and standards specified in Schedule D.

c) Landscaping and Tree Plantation

Landscaping: At major intersections, interchange etc.

Landscaping within ROW of the project highway shall be done as per specifications and standards specified in Schedule D.

d) Truck Lay-Byes:

Two 100m length and 7m width Truck lay byes with both side taper of 70m length as per Figure 12.1 of IRC:SP:84-2014 have been proposed are given below.

S No	Design Chainage	Side	Existing/Proposed	Village Name
NIL				

e) Bus Bays/Bus Shelters

Bus Bays (15m length and 3.5m width) with ghost island (width=1.5m) and taper of 100m length on both side as per Figure 12.2 of IRC:SP:84-2014 are proposed at following locations. The design of bus shelters should be aesthetically pleased with surrounding. However, locations shall be decided with Authority & Authority's Engineer at site. The minimum number of bus bays/ shelters is given below.

S No	Design Chainage (Km)	Side	Existing/Proposed	Village Name
1	274+750	Both Side	Proposed	Daili
2	276+750	Both Side	Proposed	Tumnoupokpi
3	277+950	Both Side	Proposed	Kalapahar
4	278+850	Both Side	Proposed	Keithelmanbi
5	286+100	Both Side	Proposed	Saparmeina

f) Median Opening

The median opening of 20m length are proposed at following locations with both side storage lanes of 3.5m for 55m length (minimum) where the proposed median width is 4m:

S. No.	Design Chainage (Km)	Name of Place
1	274+620	Kangpokpi bypass End Junction
2	276+800	Tumnoupokpi
3	277+750	Kalapahar
4	278+950	Keithelmanbi
5	279+900	Keithelmanbi (School Building)
6	281+700	Bethel Veng

S. No.	Design Chainage (Km)	Name of Place
7	284+750	Phoibih
8	285+900	Saparmeina
9	286+400	Saparmeina

g) Utility Duct

A 600mm diameter NP-4 Pipe with inspection box/chamber as per clause 2.16 of IRC:SP:84-2014 are proposed.

h) Others: NIL

1. **Operational and maintenance base camp-** NIL
2. **Utilities-** NIL
3. **Rainwater Harvesting-** NIL

SCHEDULE – D

(Refer Clause 2.1)

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 through Public Private Partnership (IRC: SP: 84-2014), referred to herein as the Manual.

Annex - I

(Schedule-D)

Specifications and Standards for Construction of Project Highway

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Four Laning of Highways through Public Private Partnership (IRC: SP: 84-2014), referred to as the Manual and MoRT&H Specifications for Road and Bridge Work (Fifth Revision 2013). 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

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

Notwithstanding 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 Manual shall be deemed to be amended to the extent set forth below:

S. No	Clause No	Description	Deviation to Clause
1	**2.5.1**	Median width in Open country with isolated built up area	The median width of 2.5 including Kerb Shyness of 0.5m on either side has been adopted in TCS-9, TCS-10 and TCS-13.

SCHEDULE - H

(See Clauses10.1(iv) and 19.3)

Contract Price Weightages

The Contract Price for this Agreement is **Rs ..... Crore.**

Proportions of the Contract Price for different stages of Construction of theProject Highway shall be as specified below:

Item	Weightage in Percentage to the Contract Price	Stage of for Payment	Percentage Weightage
1	**2**	**3**	**4**
Road works including New Culverts, Widening and Repair of Culverts	69.00%	**A-Widening and Strengthening of Existing Road**	
		(1) Earthwork up to top of the sub-grade	
		(2) Sub Base Course	
		(3) Non Bituminous Base Course	
		(4) Bituminous Base Course	
		(5) Bituminous Concrete	
		(6) Widening and repair of culverts	3.90%
		B.1- Reconstruction/ New 4 Lane/Realignment/ Bypass (Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	22.27%
		(2) Sub Base Course (Granular work sub-base, shoulders)	13.14%
		(3) Non Bituminous Base Course (WMM)	15.25%
		(4) Bituminous Base Course (DBM)	18.16%
		(5) Wearing Coat (Bituminous Concrete)	8.57%
		C.1- Reconstruction/ New Service road (Flexible pavement)	
		(1) Earthwork up to top of the sub-grade	
		(2) Sub Base Course (Granular work sub-base, shoulders)	
		(3) Non Bituminous Base Course (WMM)	
		(4) Bituminous Base Course (DBM)	
		(5) Wearing Coat (Bituminous Concrete)	
		D-Reconstruction and New Culverts on existing road, realignment and Bypasses,	
		(1) Culverts(length <6m)	18.71%

Item	Weightage in Percentage to the Contract Price	Stage of for Payment	Percentage Weightage
1	2	3	4
Minor Bridges / Underpasses/ Overpasses	3.55%	**A.1- Widening and Repair of Minor bridges (length>6m and <60m)**	
		Minor Bridges	
		A.2-New Minor bridges (length>6m and <60m)	
		1. Foundation + Sub-Structure: On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier Cap	48.59%
		2. Super-structure: On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects	50.07%
		3. Approaches: On completion of approaches including Retaining walls, stone pitching, protection works, filter media. etc., complete in all respects & fit for use.	1.34%
		4. Guide Bunds and river Training Works: On completion of Guide Bund and River Training Works complete in all Respects	
		B.2-New Underpass	
		1. Foundation + Sub-Structure: On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap	

Item	Weightage in Percentage to the Contract Price	Stage of for Payment	Percentage Weightage
1	2	3	4
		1. **Super-structure:** On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects Wearing Coat (a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified	
		2. Approaches: On completion of approaches including Retaining walls/Reinforced Earth walls, stone pitching, protection works, etc., complete in all respects & fit for use.	
Major Bridge (length>60m) works and ROB/UB/Elevated sections/ Flyovers including viaducts, if any		**A.1- Widening and Repair of Major Bridges**	
		1. Foundation	
		2. Sub-structure	
		3. Super-structure (including bearings)	
		4. Wearing Coat including expansion joints	
		5. Miscellaneous Items like hand rails, crash barriers, road marking etc.)	
		6. Wing walls/Return walls	
		7. Guide Bunds, River Training works etc.	
		8. Approaches (Including Retaining walls, stone pitching and protection works)	
		A.2- New Major Bridges	
		1. Foundation	
		2. Sub-structure	
		3. Super-structure (including bearings)	
		4. Wearing Coat including expansion joints	

Item	Weightage in Percentage to the Contract Price	Stage of for Payment	Percentage Weightage
1	2	3	4
		5. Miscellaneous Items like hand rails, crash barriers, road marking etc.)	
		6. Wing walls/Return walls	
		7. Guide Bunds, River Training works etc.	
		8. Approaches (Including Retaining walls, stone pitching and protection works)	
Other Works	27.45%	(ii) . Road Side Drain	14.10%
		(iii).Road signs, markings, km stones, safety devices… a) W beam crash barrier b) Utility Duct c) Misc.	 4.65% 7.68%
		(iv).Project Facilities a) Bus Shelter b) Truck lay byes	 8.16% 1.57%
		(v) Road side Plantation	
		(vi) Protection works other than approaches to the bridges, elevated section/flyover/grade separator and ROBs/ RUBs	0.72%
		(vii) Protection works a) Retaining wall b) Breast wall c) Toe Wall d) Surficial protection and Erosion Control Measures (Cut Height of Side slope >25m)	 17.85 % 34.37 % 3.94 %

Item	Weightage in Percentage to the Contract Price	Stage of for Payment	Percentage Weightage
1	2	3	4
		(viii) Safety and Traffic Management during Construction	-
		(ix) Utility Shifting	6.96%

Procedure of estimating the value of work done

Road works

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

Table 1.3.1

Stage of Payment	Percentage Weightage	Payment Procedure
A-Widening and Strengthening of Existing Road		
(6) Widening and repair of culverts	3.90%	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 5 (Five) Culverts.
B.1- Reconstruction/ New 4 Lane/Realignment/ Bypass (Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	22.27%	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 5 (five) km length, whichever is less.
(2) Sub Base Course	13.14%	
(3) Non Bituminous Base Course (WMM)	15.25%	
(4) Bituminous Base Course (DBM)	18.16%	
(5) Wearing Coat (Bituminous Concrete)	8.57%	

D -Reconstruction and New Culverts on existing road, realignment and Bypasses, Culvert (length<6m)	18.71%	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 5(Five) 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

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 payment purposes. The total length calculated here is only for payment purposes and will not affect and referred in other clauses of the Contract Agreement.

Minor Bridge and Underpasses/Overpasses

Procedure for estimating the value of Minor Bridge and Underpass/overpasses shall be as stated in Table 1.3.2:

Table 1.3.2

Stage of Payment	Percentage 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 of the Minor Bridge. Payment shall be made on the completion of widening and repair work of Minor Bridge.
A.2- New Minor Bridges		
1. Foundation +Sub-Structure: On completion of foundation work including foundations for wing	48.59%	**1. Foundation +Sub-Structure:** Cost of each Minor Bridge shall be determined on pro rata basis with respect to

and return walls, abutments, piers up to the abutment/pier cap		the total linear length (m) of the Minor Bridges. Payment against foundation+ substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure of each bridge subject to completion of at least two foundations along with sub structure upto abutment/pier cap level of each bridge.
2. Super-structure: On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects	50.07%	**2. 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 respect as specified in the column of "Stage of Payment" in this sub-clause.
3. Approaches: On completion of approaches including Retaining walls, stone pitching, protection works, filter media. etc., complete in all respects & fit for use.	1.34%	**3. Approaches**: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
4. Guide Bunds and River Training Works: On completion of Guide Bunds and River Training Works complete in all respects		**4. 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.
B.2- New Underpass/Overpasses		

1. Foundation +Sub-Structure: On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap		**1. Foundation +Sub-Structure:** Cost of each Underpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpass. Payment against foundation+ substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure of each Underpass subject to completion of at least two foundations along with sub-structure upto abutment/pier cap level of each Underpass.
3. **Super-structure:** On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects Wearing Coat (a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified.		**2. 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 respect as specified in the column of "Stage of Payment" in this sub-clause.
3. Approaches: On completion of approaches including Retaining walls/Reinforced Earth walls, stone pitching, protection works,. etc., complete in all respects & fit for use.		**3. Approaches** : Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified.

Major Bridge works, ROB/RUB and Structures

Procedure for estimating the value of Major Bridge works, ROB/RUB and Structures shall be as stated in Table 1.3.3

Table 1.3.3

Stage of Payment	Percentage Weightage	Payment Procedure
A.2- New Major Bridges		
1. Foundation:		**1. Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of Major bridge subject to completion of at least two foundations of the Major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
2. Sub-Structure		**2. Sub-Structure:** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the major bridge subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
3.Super-structure (including bearings)		**3. Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure including bearing of at least one span in all respect as specified.

4.Wearing coat including expansion joints		**4. Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified.
5.Miscellaneous Items like hand rails, crash barriers, road marking etc.		**5. Miscellaneous:** Payment shall be made on completion of all miscellaneous works like hand rails, crash barrier, road marking etc. complete in all respect as specified.
6.Wing walls/ Return walls		**6. Wing walls/ Return walls:** Payment shall be made on completion of all wing walls/return walls complete in all respect as specified.
7.Guide bunds, River Training works etc.		**7. Guide bunds, River Training works:** Payment shall be made on completion of all Guide bunds/ River Training works etc. complete in all respect as specified
8.Approaches (including Retaining walls, stone pitching and protection works)		**8. Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works etc. complete in all respect as specified

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	Percentage Weightage	Payment Procedure
(i) Road side drains	14.10%	

(ii) Road signs, markings, km stones, safety devices… d) W beam crash barrier e) Utility Duct f) Misc.	 4.65% 7.68%	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 10 (Ten) percent of the total length.
(iii) Project facilities		
a) Bus Shelter	8.16%	Payment shall be made on pro rata basis for completed facilities.
b) Truck lay-byes	1.57%	
(iv) Roadside plantation		Unit of measurement is linear length.
(v) Protection works other than approaches to the bridges, elevated section/flyover/grade separator and ROBs/ RUBs	0.72%	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 10 (Ten) percent of the total length.
(vi) Protection works a) Retaining wall b) Breast wall c) Toe wall d) Surficial protection and Erosion Control Measures (Cut Height of Side slope >25m)	 17.85 % 34.37 % 3.94 %	
(vii) Safety and traffic management during construction	--	Payment shall be made on pro rata basis every six months.
(viii) Utility Shifting	6.96%	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 10% (ten percent) of the total length.

2. Procedure for payment for Maintenance

The cost for maintenance shall be as stated in Clause 14.1.1.

Payment for Maintenance shall be made in quarterly installments in accordancewith the provisions of Clause 19.7.