National Highways & Infrastructure Development Corporation Limited

BUILDING INFRASTRUCTURE - BUILDING THE NATION

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

Schedule

For

"Strengthening & Upgradation of existing carriageway to intermediate lane from Km 0.000 to Km 42.820 of length 42.820Kms on Baramulla-Gulmarg section of NH-701A in the Union Territory of Jammu & Kashmir on EPC mode"

June, 2020

National Highways & Infrastructure Development Corporation Ltd
3rd floor, PTI Building, 4-Parliament Street,
New Delhi – 110001

TABLE OF CONTENTS

SCHEDULES 5

Schedule-A **6**

Site of the Project **6**

1. The Site 6

Annex – I **7**

Site **7**

Nil **13**

Annex – II **14**

Dates for providing Right of Way of Construction Zone 14

Annex - III **15**

Alignment Plans **15**

Annex – IV **16**

Environment Clearances **16**

Schedule - B **17**

Development of the Project Highway **17**

1. Development of the Project Highway **17**

2. Rehabilitation and augmentation **17**

3. Specifications and Standards **17**

Annex – I 18

Description of the Project 18

Schedule - C **44**

Project Facilities **44**

1. ProjectFacilities 44

2. Description of ProjectFacilities 44

Schedule - D **49**

Specifications and Standards **49**

1. Construction 49

2. Design Standards 49

Annex – I 50

Specifications and Standards for Construction 50

Schedule - E 51

Maintenance Requirements 51

1. MaintenanceRequirements 51

2. Repair/rectification of Defects anddeficiencies 51

3. Other Defects anddeficiencies 51

4. Extension of timelimit 51

5. Emergencyrepairs/restoration 51

6. Daily inspection by theContractor 51

7. Pre-monsoon inspection / Post-monsooninspection 52

8. Repairs on account of naturalcalamities 52

Annex -I 53

Repair/rectification of Defects and deficiencies 53

Table -1: Maintenance Criteria for Pavements: 53

Table -3: Maintenance Criteria for Safety Related Items and Other Furniture Items: 63

Schedule - F 78

Applicable Permits 78

1. Applicable Permits 78

Schedule – G 79

Annex-I 79

Form of Bank Guarantee 79

Form for Guarantee for Advance Payment 82

Schedule - H 85

Contract Price Weightages 85

Schedule - I 90

Drawings 90

1. Drawings 90

2. AdditionalDrawings 90

Annex – I 91

List of Drawings 91

Schedule - J 92

Project Completion Schedule 92

1. Project CompletionSchedule 92
2. ProjectMilestone-I 92
3. ProjectMilestone-II 92
4. ProjectMilestone-III 92
5. Scheduled CompletionDate 92
6. Extension oftime 92

Schedule - K 93

Tests on Completion 93

1. Schedule forTests 93
2. Tests 93
3. Agency for conductingTests 93
4. CompletionCertificate 94

Schedule - L 95

Completion Certificate 95

Schedule - M 96

Payment Reduction for Non-Compliance 96

1. Payment reduction for non-compliance with the Maintenance Requirements 96
2. Percentage reductions in lump sum payments on monthlybasis 96

Schedule - N 98

Selection of Authority's Engineer 98

1. Selection of Authority'sEngineer 98
2. Terms ofReference 98
3. Appointment of Government entity as Authority'sEngineer 98

Terms of Reference for Authority's Engineer 99

Schedule - O 104

Forms of Payment Statements 104

1. Stage Payment Statement forWorks 104
2. Monthly Maintenance PaymentStatement 104
3. Contractor's claim forDamages 104

Schedule - P 105

Insurance 105

1. Insurance during ConstructionPeriod 105
2. Insurance for Contractor's DefectsLiability 105
3. Insurance against injury to persons and damage toproperty 105
4. Insurance to be in jointnames 105

Schedule-Q 107

Tests on Completion of Maintenance Period 107

1. Riding Qualitytest 107
2. Visual and physicaltest 107

Schedule-R 108

Taking Over Certificate 108

SCHEDULES

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

(i) Site of the existing single/intermediate lane Project Highway shall include the land, buildings, structures and road works as described in **Annex-I** of thisSchedule-A.

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

(iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2 (i) of thisAgreement.

(iv) 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 Annex-III based on site/design requirement.

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

Annex – I

(Schedule-A)

Site

1. Site

The site of the existing single/intermediate lane Project Highway comprisesthe section of newly declared NH-701A commencing from km 0+000 to km 42+820 i.e. the Baramulla-Gulmarg section in the Union Territory of Jammu &Kashmir. The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project Highway comprises the land (sum of land already in possession and land to be possessed) as described below:

Sr. No.	Chainage (km)		Right of Way (m)	Remarks
	From	To		
1	0+000	1+000	8.45	
2	1+000	2+000	8.00	
3	2+000	3+000	7.54	
4	3+000	5+000	7.00	
6	5+000	6+000	7.39	
7	6+000	7+000	7.15	
8	7+000	8+000	7.50	
9	8+000	9+000	9.20	
10	9+000	29+000	6.50-7.50	
30	29+000	30+000	8.60	
31	30+000	33+000	9.50	
34	33+000	34+000	10.50	
35	34+000	42+820	10.00	

3. Carriageway

The present carriageway of the Project Highway is Single/Intermediate Lane. The type of the existing pavement is flexible.

4. Major Bridges

The Site includes the following Major Bridges:

Sr. No.	Ex Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
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.	Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)	ROB/ RUB
		Foundation	Superstructure			
Nil						

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Super-structure		
1	16+955	Open	Brick/StoneMasonry	Steel Truss	1 X 14.7	5.60
2	18+203	Open	Stone Masonry	Steel Truss	1 X 21.6	5.60
3	32+352	Open	RCC	Solid Slab	1x6.1	8.00
4	37+341	Open	Stone Masonry	Solid Slab	1x8.0	8.00

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the followingunderpasses:

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

10. Culverts

The Site has the following culverts:

S. No.	Chainage (km)	Type of Culverts	Span Arrangement (No. X length) (m)	Width (m)
1	0+000	Slab	1 X 4	8.0
2	01+272	Pipe	1 X 0.45	6.5
3	01+571	Slab	1 X 0.6	6.5
4	01+725	Causeway	-	6.5
5	02+168	Pipe	1 X 0.45	6.5
6	02+190	Pipe	1 X 0.45	6.5
7	02+296	Pipe	1 X 0.45	6.5
8	03+298	Pipe	1 X 0.45	6.5
9	04+084	Pipe	1 X 0.6	6.5
10	04+626	Pipe	1 X 0.3	6.5
11	04+771	Pipe	1 X 0.6	6.5
12	04+872	Pipe	1 X 0.6	6.5
13	05+160	Pipe	1 X 0.45	6.5
14	05+202	Pipe	1 X 0.6	6.5
15	05+260	Pipe	1 X 0.6	6.5
16	05+385	Pipe	1 X 0.45	6.5
17	05+460	Pipe	1 X 0.45	6.5

S. No.	Chainage (km)	Type of Culverts	Span Arrangement (No. X length) (m)	Width (m)
18	05+580	Pipe	1 X 0.6	6.5
19	05+678	Pipe	1 X 0.6	6.5
20	05+790	Pipe	1 X 0.6	6.5
21	06+187	Pipe	1 X 0.6	6.5
22	06+246	Pipe	1 X 0.6	6.5
23	06+500	Causeway	-	6.5
24	06+628	Pipe	1 X 0.45	6.5
25	06+762	Pipe	1 X 0.6	6.5
26	07+255	Pipe	1 X 0.6	6.5
27	07+327	Pipe	1 X 0.6	6.5
28	7+469	Pipe	1 X 0.3	6.5
29	07+901	Pipe	1 X 0.6	6.5
30	08+002	Pipe	1 X 1	4.5
31	08+114	Pipe	1 X 0.6	4.5
32	08+291	Pipe	1 X 0.6	4.5
33	08+729	Pipe	1 X 0.45	4.5
34	9+285	Pipe	1 X 0.3	4.5
35	09+375	Pipe	1 X 0.3	4.5
36	09+873	Pipe	1 X 0.3	4.5
37	9+935	Pipe	1 X 0.45	4.5
38	10+478	Pipe	1 X 1	4.5
39	10+704	Pipe	1 X 0.45	4.5
40	12+453	Pipe	1 X 0.3	4.5
41	12+891	Pipe	1 X 0.45	4.5
42	15+462	Pipe	1 X 0.9	4.5
43	16+473	Pipe	1 X 0.45	4.5
44	16+740	Pipe	1 X 0.4	4.5
45	17+684	Slab	1 X 1.5	4.5
46	18+528	Pipe	1 X 0.9	4.5
47	18+614	Pipe	1 X 0.6	4.5
48	18+774	Pipe	1 X 1	4.5
49	19+713	Pipe	1 X 1	4.5
50	20+649	Pipe	1 X 0.6	4.5
51	21+950	Pipe	1 X 0.5	4.5
52	22+523	Pipe	1 X 0.5	4.5
53	23+053	Slab	1 X 3.5	4.5
54	23+485	Pipe	1 X 0.45	4.5
55	23+927	Pipe	1 X 0.2	4.5
56	24+116	Slab	1 X 3	4.5
57	24+374	Pipe	1 X 0.4	4.5
58	24+588	Slab	1 X 3	4.5
59	24+686	Pipe	1 X 0.3	4.5
60	24+874	Pipe	1 X 0.5	4.5
61	25+038	Pipe	1 X 0.3	4.5
62	25+271	Pipe	1 X 0.2	4.5
63	25+524	Pipe	1 X 0.5	4.5
64	26+049	Pipe	1 X 0.5	4.5
65	26+187	Pipe	1 X 0.9	4.5
66	26+274	Pipe	1 X 0.9	4.5

S. No.	Chainage (km)	Type of Culverts	Span Arrangement (No. X length) (m)	Width (m)
67	26+410	Pipe	1 X 0.6	4.5
68	27+237	Pipe	1 X 0.2	4.5
69	27+252	Pipe	1 X 0.3	4.5
70	27+605	Pipe	1 X 0.4	4.5
71	27+803	Pipe	1 X 0.4	4.5
72	27+848	Pipe	1 X 0.45	4.5
73	29+700	Pipe	1 X 0.6	4.5
74	29+725	Pipe	1 X 0.45	4.5
75	29+824	Pipe	1 X 2.6	8.0
76	29+968	Pipe	2 X 3	4.5
77	30+218	Pipe	1 X 0.9	4.5
78	30+247	Pipe	1 X 1	4.5
79	30+368	Pipe	1 X 0.45	4.5
80	30+450	Slab	1 X 0.9	4.5
81	30+592	Slab	1 X 2.12	4.5
82	30+912	Slab	1 X 2.8	4.5
83	31+043	Pipe	1 X 0.3	4.5
84	31+513	Pipe	1 X 0.9	4.5
85	31+580	Pipe	1 X 0.3	4.5
86	31+726	Pipe	1 X 0.9	4.5
87	31+787	Slab	1 X 1	4.5
88	31+922	Slab	1 X 1	4.5
89	32+081	Slab	1 X 1.6	4.5
90	32+174	Slab	1 X 1.7	6.5
91	32+296	Pipe	1 X 0.45	4.5
92	32+407	Pipe	1 X 0.45	4.5
93	32+508	Pipe	1 X 0.3	6.5
94	32+576	Pipe	1 X 0.7	4.5
95	32+685	Pipe	1 X 0.3	6.5
96	32+748	Pipe	1 X 0.45	6.5
97	32+782	Slab	1 X 1.7	6.5
98	32+827	Slab	1 X 1.1	4.5
99	32+868	Slab	1 X 1.8	4.5
100	33+058	Pipe	1 X 0.9	6.5
101	33+123	Pipe	1 X 0.3	6.5
102	33+681	Slab	1 X 2	6.5
103	34+238	Slab	1 X 4	6.5
104	34+282	Slab	1 X 2.4	6.5
105	34+387	Pipe	1 X 0.6	6.5
106	34+446	Pipe	1 X 0.45	6.5
107	34+697	Slab	1 X 1.6	6.5
108	34+877	Pipe	1 X 0.45	6.5
109	34+963	Pipe	1 X 0.45	6.5
110	35+075	Pipe	1 X 0.45	6.5
111	35+181	Slab	1 X 3	6.5
112	35+260	Pipe	1 X 0.6	6.5
113	35+352	Pipe	1 X 0.45	6.5
114	35+505	Pipe	1 X 0.6	6.5
115	35+665	Slab	1 X 4	6.5

S. No.	Chainage (km)	Type of Culverts	Span Arrangement (No. X length) (m)	Width (m)
116	35+794	Pipe	1 X 1.6	6.5
117	36+154	Slab	1 X 4	6.5
118	36+345	Pipe	1 X 1.5	6.5
119	36+627	Pipe	1 X 0.6	6.5
120	36+895	Pipe	1 X 0.3	6.5
121	36+942	Pipe	1 X 0.9	6.5
122	37+065	Slab	1 X 0.6	8.0
123	37+140	Pipe	1 X 0.6	8.0
124	37+360	Slab	1 X 4	6.5
125	37+890	Slab	1 X 4	8.0
126	38+117	Pipe	1 X 0.45	8.0
127	38+155	Pipe	1 X 0.6	8.0
128	38+490	Pipe	1 X 0.2	8.0
129	38+537	Pipe	1 X 1.5	8.0
130	38+713	Pipe	1 X 0.6	8.0
131	38+850	Pipe	1 X 0.6	8.0
132	38+917	Pipe	1 X 0.6	8.0
133	39+217	Pipe	1 X 0.6	8.0
134	39+367	Slab	1 X 4	6.5
135	39+704	Slab	1 X 4	7.0
136	39+880	Pipe	1 X 0.2	7.0
137	40+090	Pipe	1 X 0.6	8.0
138	40+141	Pipe	1 X 0.6	7.0
139	40+572	Pipe	1 X 0.6	7.0
140	40+685	Pipe	1 X 0.6	7.0
141	41+028	Pipe	1 X 0.6	7.0
142	41+152	Pipe	1 X 0.6	7.0
143	41+667	Pipe	1 X 0.6	7.0
144	41+934	Pipe	1 X 0.4	7.0
145	42+230	Pipe	1 X 0.45	7.0
146	42+595	Pipe	1 X 0.4	7.0
147	42+790	Pipe	1 X 0.45	7.0

11. Bus bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Roadside drains

The details of the roadside drains are as follows:

S. No.	Location		Type	
	From km	to km	Masonry/cc (Pucca)	Earthen (Kutcha)
Nil				

14. Major junctions

The details of major junctions are as follows:

S. No.	Location km	At grade	Separated	Category of Cross Road				Remarks
				NH	SH	MDR	Others	
1	0+000	√		√				@ Baramulla Uri-Srinagar Highway NH-1
2	33+830	√				√		Tangmarg

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

15. Minor junctions

The details of the minor junctions are as follows:

S. No.	Location in km	Type	Side		Remarks
			LHS	RHS	
1	0+245	Y	-	Kanali Bagh	
2	0+540	Staggered	Rangwar	Bilal	
3	2+025	Y	Cheradari	-	
4	9+340	Y	DardpuraKatiya	-	
5	9+865	Y	-	Gauni	
6	12+020	Y	Pothaka	-	
7	12+720	Y	-	Grill Gaon	
8	13+090	Y	-	Village	
9	13+120	Y	-	Village	
10	13+910	T	Gulmarg	Baramulla	
11	14+210	Y	-	Sheikh Pati	
12	14+725	Y	Puthka	-	
13	15+085	Y	-	Babareshi	
14	15+470	Y	-	Babareshi	
15	16+260	Y	-	Village	
16	16+300	Y	Wagora	-	
17	16+820	Y	Wagora	-	
18	17+500	Y	-	Banja	
19	18+600	T	Baramulla	Gulmarg	
20	18+640	Y	Pothaka	-	
21	21+190	Y	Village	-	
22	23+590	T	Gulmarg	Baramulla	
23	27+210	Y	-	Chandausa	
24	30+200	Y	-	Babareshi	
25	42+890	T	Gulmarg	Baramulla	

16. Bypasses

The details of the existing road sections proposed to be bypassed are as follows:

S. No.	Name of bypass (town)	Chainage (km) From km to km	Length (in Km)
Nil			

17. Others

Nil

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

Sl. No.	From (Km)	To (Km)	Length (Km)	Width (m)	Date of providing Right of Way*
1	2		3	4	5
(i) Full Right of Way (Full Width)	0+000	1+000	1.000	8.45	On Appointed Date *
	1+000	2+000	1.000	8.00	
	2+000	3+000	1.000	7.54	
	3+000	5+000	2.000	7.00	
	5+000	6+000	1.000	7.39	
	6+000	7+000	1.000	7.15	
	7+000	8+000	1.000	7.50	
	8+000	9+000	1.000	9.20	
	9+000	29+000	20.000	6.50-7.50	
	29+000	30+000	1.000	8.60	
	30+000	33+000	3.000	9.50	
	33+000	34+000	1.000	10.50	
	34+000	42+820	8.820	10.00	

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

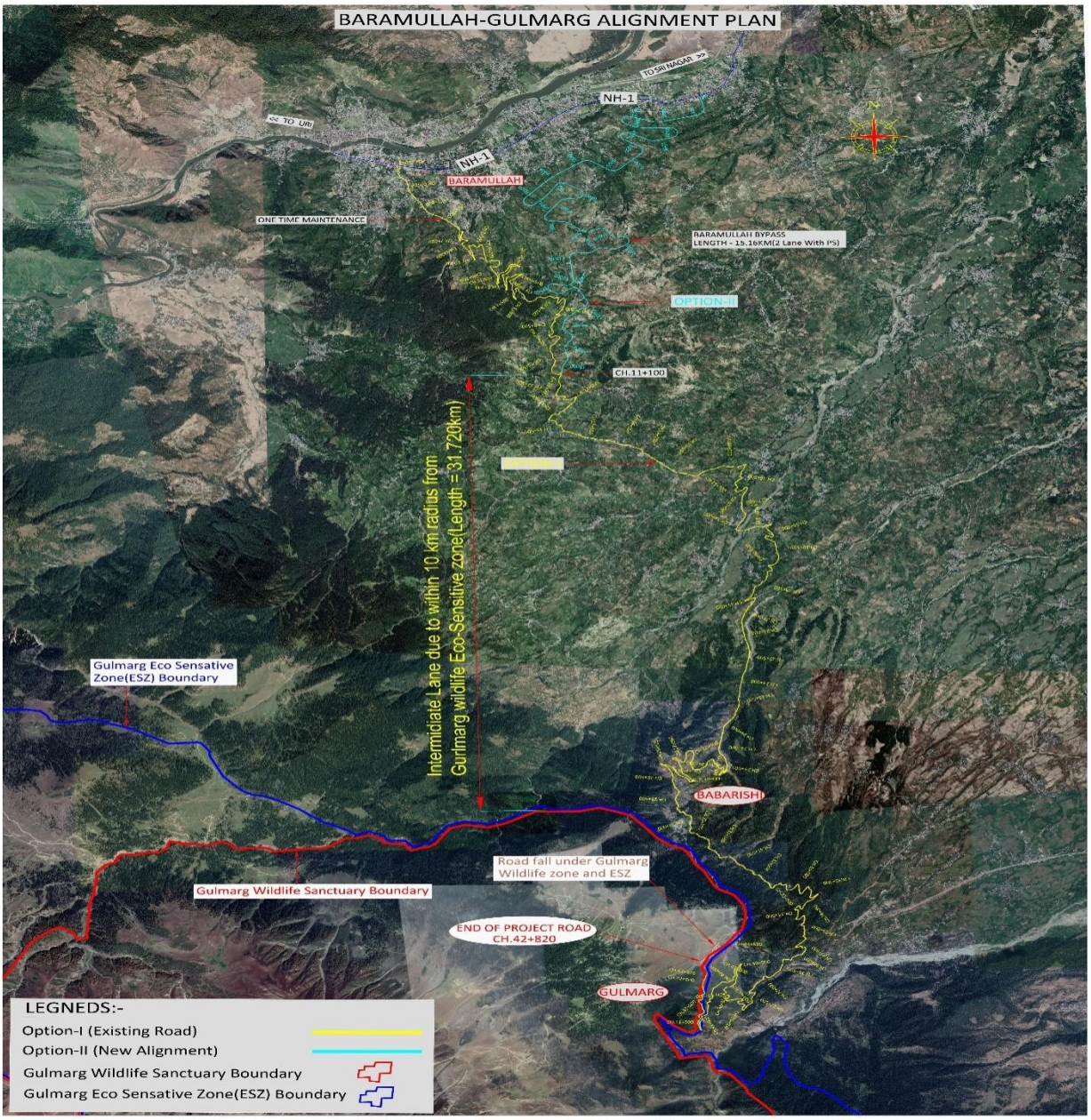
Annex - III

(Schedule-A)

Alignment Plans

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

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



Annex – IV

(Schedule-A)

Environment Clearances

As per EIA notification 2006 and its amendment S.O.2559 (E) Dt 22nd August 2013, S.O 996(E) Dt 10th April 2015, S.O 382(E) Dt 3rd February 2015 Environmental Clearance Exempted from the purview of the Environmental Impact Assessment

[To be published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section(ii)]

MINISTRY OF ENVIRONMENT AND FORESTS
NOTIFICATION

New Delhi, the 22nd August, 2013

S.O. 2559 (E).- Whereas by notification of the Government of India in the Ministry of Environment and Forests vide number S.O.1533(E), dated the 14th September, 2006 issued under sub-section (1) and clause (v) of sub-section (2) of section (3) of the Environment (Protection) Act, 1986 read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government directed that on and from the date of its publication, the required construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to the said notification entailing the capacity addition with change in process or technology and or product mix shall be undertaken in any part of India only after prior environmental clearance from the Central Government or as the case may be, by the State level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of the said Act, in accordance with the procedure specified therein;

And whereas the Government of India in the Ministry of Environment and Forests had constituted a High Level Committee under the Chairmanship of Member (Environment and Forests and Science and Technology), Planning Commission, vide OM No.21-270/2008-IA.III dated the 11th December, 2012 to review the provisions of Environmental Impact Assessment Notification, 2006 relating to granting Environmental Clearances for Roads, Buildings and Special Economic Zone projects and provisions under the OM dated the 7th February, 2012 issued by the Ministry of Environment and Forests regarding guidelines for High Rise Buildings;

And whereas one of the terms of reference (ToR) of the Committee was to review the requirement of Environmental Clearance for highway expansion projects upto the right of way of 60 meters and length of 200 kms under Environmental Impact Assessment notification;

And whereas the Committee has submitted its report to the Ministry and on this ToR, the Committee has recommended exempting highway expansion projects from the requirement of scoping and that Environmental Impact Assessment or Environment Management Plan for highway expansion projects may be prepared on the basis of model ToRs to be posted on Ministry's website and in respect of requirement of environmental clearance, the Committee has recommended that expansion of National Highway projects up to 100 kms involving additional right of way or land acquisition upto 40 mts on existing alignments and 60 mts on re-alignments or by-passes may be exempted from the preview of the notification;

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

Rehabilitation and augmentation shall include intermediate lane and Strengthening of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of the Project

Strengthening & Upgradation of existing carriageway to intermediate lane from Km 0.000 to Km 42.820 on Baramulla-Gulmarg section of NH-701A in accordance with IRC-SP:73-2018&IRC: SP:48-1998. If any standards, specification or details are not given in the manual, the minimum design/ construction requirements shall be specified in the schedule.

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

(a) Intermediate lane with / without hard shoulder shall be undertaken. The paved carriageway shall be 5.5m in accordance with the typical cross section's drawings attached in Schedule B-1.

(b) Except as otherwise provided in this agreement, the width of the paved carriageway and cross-sectional features shall confirm to paragraph 1.1 above.

2. Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual.

(ii) Design speed

The design speed shall be theminimum design speed of 20 km/hr. for mountainous/hilly terrain as perIRC: SP-48:1998. However, the design speed shall be kept as per existing road geometric.

(iii) Improvement of the existing roadgeometrics

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, since the existing road is being abandoned and new alignment is being proposed.

Sl. No.	Stretch (from km to km)	Type of deficiency	Remarks
Nil			

(iv) Right ofWay

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

(v) Type ofshoulders

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

Sl.No.	Stretch(from km to km)	Fully paved shoulders/ footpaths	Reference to cross section
Nil			

(b) In open country/hilly areas, paved shoulders of 1.5m width shall be provided on either side and balance 1.0m width earthen shoulder at valley side only shall be covered with 150

mm thick compacted layer of granularmaterial for main road. In link road 1m of earthen shoulder shall be provided either on both side or on Valley side as per attached typical cross section in schedule B-1 of this manual, shall be covered with 150 mm thick compacted layer of granularmaterial

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

(vi) Lateral and vertical clearances atunderpasses

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

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

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

(vii) Lateral and vertical clearances atoverpasses

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

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

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

(viii) Serviceroads

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

Sl.No.	Location of service road (from km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (m) of service road
Nil			

(ix) Grade separatedstructures

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

Sl. No.	Location of structure	Length (m)	Number and length of spans (m)	Approach gradient	Remarks, if any
Nil					

In the case of grade separated structures, the type of structure and the level of the Project Highway and the crossroads shall be as follows:

Sl. No.	Location	Type of structure Length (m)	Cross road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
Nil						

(x) Cattle and pedestrian underpass/overpass

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

Sl. No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the ProjectHighway

Following typical cross sections shall be provided for the Project Highway However to

be designed as per manual.

Sl. No.	TCS No.	Description	Length in m	Length in km
1	TCS-1	WIDEIING & STRENGTHENING WITH ONE SIDE FILL & ONE SIDE CUT	21905	21.905
2	TCS-2	WIDEIING & STRENGTHENING WITH ONE SIDE FILL & ONE SIDE CUT WITH PROTECTION WORK ON BOTH SIDE	60	0.060
3	TCS-3	WIDEIING & STRENGTHENING WITH ONE SIDE FILL & ONE SIDE CUT WITH PROTECTION WORK	860	0.860
4	TCS-4	WIDEIING & STRENGTHENING WITH ONE SIDE FILL WITH PROTECTION WORK & ONE SIDE CUT	160	0.160
5	TCS-5	STRENGTHENING WITH OVERLAY WITHOUT WIDENING	13805.9	13.8059
6	TCS-6	WIDEIING & STRENGTHENING WITH RCC COVERED DRAIN ON BOTH SIDE IN BUILTUP -LOCATION	5975	5.975
7		MINOR BRIDGE	54.1	0.0541
		Total Length	**42820**	**42.820**

3. Intersections and Grade Separators

All intersections and grade separators shall be as per the provision of relevant Manual.Existing intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tablesbelow:

(i) At-gradeintersections

Sl. No.	Location of intersection	Type ofintersection	Other features	Remarks
1	0+000	T	NH-1	Uri-Srinagar
2	33+830	Y	MDR	Junction of Baramulla-Srinagar Road and Baramulla-Gulmarg Road (NH-701A

Sr. No.	Design Chainage (Km)	Side		Type
		LHS	RHS	
1	0+245	-	Kanali Bagh	Y
2	0+540	Rangwar	Bilal	Staggered
3	2+025	Cheradari	-	Y
4	9+340	DardpuraKatiya	-	Y
5	9+865	-	Gauni	Y
6	12+020	Pothaka	-	Y
7	12+720	-	Grill Gaon	Y
8	13+090	-	Village	Y
9	13+120	-	Village	Y
10	13+910	Gulmarg	Baramulla	T

Sr. No.	Design Chainage (Km)	Side		Type
		LHS	RHS	
11	14+210	-	Sheikh Pati	Y
12	14+725	Puthka	-	Y
13	15+085	-	Babareshi	Y
14	15+470	-	Babareshi	Y
15	16+260	-	Village	Y
16	16+300	Wagora	-	Y
17	16+820	Wagora	-	Y
18	17+500	-	Banja	Y
19	18+600	Baramulla	Gulmarg	T
20	18+640	Pothaka	-	Y
21	21+190	Village	-	Y
22	23+590	Gulmarg	Baramulla	T
23	27+210	-	Chandausa	Y
24	30+200	-	Babareshi	Y
25	42+890	Gulmarg	Baramulla	T

(ii) Grade separated intersection with/withoutramps

Sl. 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

(i) 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.

(ii) Raising of the existing road

The existing road shall be raised in the following sections:

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

5. Pavement Design

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

(ii) Type ofpavement

Flexible pavement is proposed for the project highway in accordance with IRC: 37-2018. Minimum crust thickness shall be proposed as per given below:

Layer	Thickness (mm)
BC	40
DBM	75
WMM (Upper layer)	125
WMM (Bottom layer)	125
GSB (Upper layer)	100
GSB (Bottom Layer)	100
Total Thickness	**565**

Note: Strengthening & overlay with minimum 50mm of DBM & 40mm of BC shall be carried out in TCS-05.

(iii) Design requirements

(a) Design Period andstrategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 20 years. Stage construction shall not be permitted.

(b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for a minimum design traffic of 20(MSA) million standard axles.

(iv) Reconstruction of stretches

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

Sl. No.	Stretch in km		Length in km	Remarks
	From	To		
1	0+000	29+000	29.000	from GSB top on existing road

6. Roadside Drainage

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

Roadside RCC Covered Drain			
Design Chainage in Km		Side	Roadside Drain Length (m)
From	To		
00+000	01+700	Both side	1700
08+900	09+200	Both side	300
12+500	14+900	Both side	2400
17+300	17+850	Both side	550
17+850	18+000	Both side	150
18+000	18+191	Both side	190.5
18+216	18+500	Both side	284.5
23+000	23+400	Both side	400
Total Length in m			**2x5975**

Roadside Catch Drain on Hill side		
Design Chainage in km	TCS Type	Roadside Drain

From	To		Length (m)
01+700	01+810	TCS-1	110
01+810	01+840	TCS-3	30
01+840	01+900	TCS-1	60
01+900	01+920	TCS-3	20
01+920	02+090	TCS-1	170
02+090	02+170	TCS-3	80
02+170	02+210	TCS-4	40
02+210	02+300	TCS-1	90
02+300	02+330	TCS-4	30
02+330	02+390	TCS-2	60
02+390	02+420	TCS-4	30
02+420	02+450	TCS-3	30
02+450	02+540	TCS-1	90
02+540	02+580	TCS-3	40
02+580	02+660	TCS-1	80
02+660	02+680	TCS-3	20
02+680	02+900	TCS-1	220
02+900	02+980	TCS-3	80
02+980	03+160	TCS-1	180
03+160	03+190	TCS-3	30
03+190	04+430	TCS-1	1240
04+430	04+450	TCS-3	20
04+450	04+980	TCS-1	530
04+980	05+000	TCS-3	20
05+000	05+070	TCS-1	70
05+070	05+100	TCS-3	30
05+100	05+120	TCS-1	20
05+120	05+140	TCS-3	20
05+140	05+190	TCS-1	50
05+190	05+210	TCS-3	20
05+210	06+200	TCS-1	990
06+200	06+220	TCS-4	20
06+220	06+410	TCS-1	190
06+410	06+430	TCS-3	20
06+430	07+310	TCS-1	880
07+310	07+350	TCS-4	40
07+350	07+390	TCS-1	40

Roadside Catch Drain on Hill side			
Design Chainage in km		TCS Type	Roadside Drain Length (m)
From	To		
07+390	07+420	TCS-3	30
07+420	07+470	TCS-1	50
07+470	07+540	TCS-3	70
07+540	08+900	TCS-1	1360
09+200	09+280	TCS-1	80
09+280	09+300	TCS-3	20
09+300	09+930	TCS-1	630
09+930	09+950	TCS-3	20
09+950	12+500	TCS-1	2550
14+900	16+948	TCS-1	2047.5
16+963	17+300	TCS-1	337.5
18+500	23+000	TCS-1	4500
23+400	25+280	TCS-1	1880
25+280	25+300	TCS-3	20
25+300	25+420	TCS-1	120
25+420	25+500	TCS-3	80
25+500	25+890	TCS-1	390
25+890	26+010	TCS-3	120
26+010	26+050	TCS-1	40
26+050	26+090	TCS-3	40
26+090	29+000	TCS-1	2910
Total length in m			**22985**

Roadside Earthen/line Drain			
Design Chainage in Km		Side	Roadside Drain Length (m)
From	To		
29+000	32+349	Both side	3348.95
32+355	37+337	Both side	4981.95
37+345	42+820	Both side	5475.00
Total Length in m			**2x13805.90**

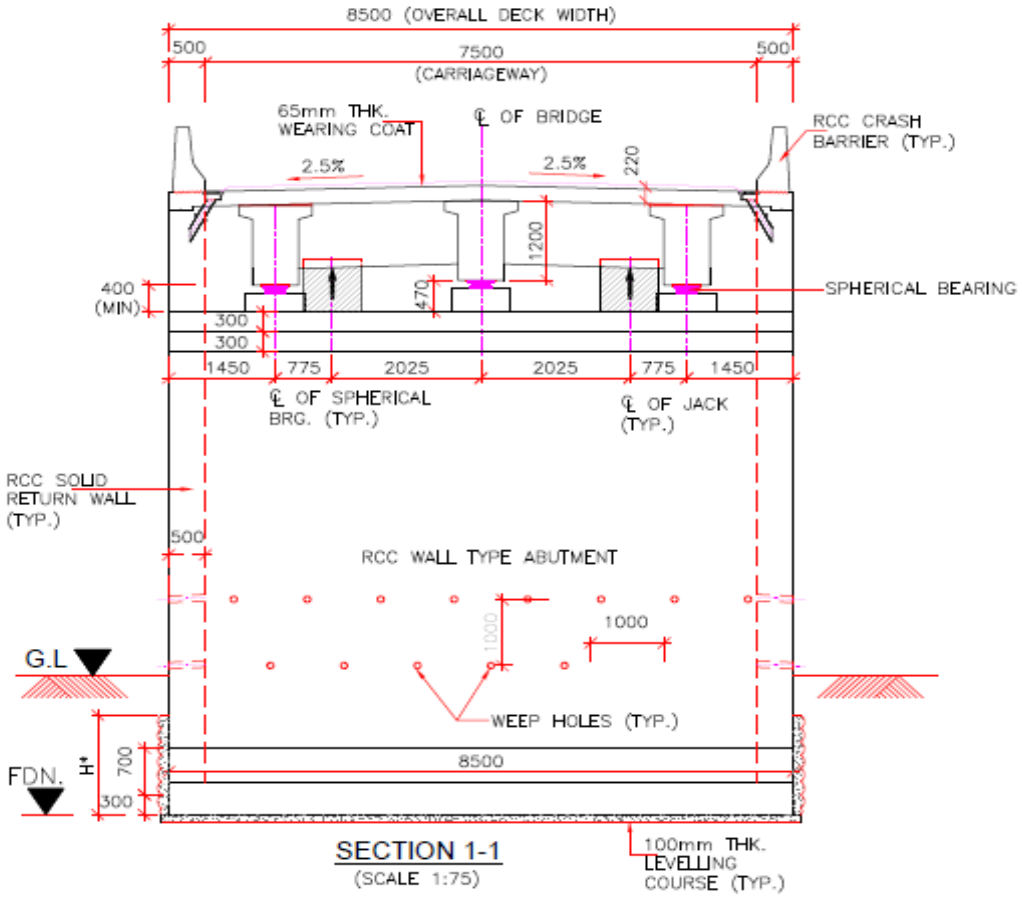
8. Design of Structures

(i) General

(a) All bridges, culverts and structures shall be designed and constructed in accordance with the provision of relevant Manual and shall conform to the cross- sectional features and other details specifiedtherein.

(b) Width of the carriageway of new bridges and structures shall be asfollows:

Sl. No.	Structure/ Bridge at km	Width of carriageway and cross-sectional features*
1	16+955, 18+203, 32+352 and 37+341	Width of Carriageway –7.5m including Kerb Shyness Crash Barrier – 0.50m (both sides) Total Width – 8.50m



(c) The following structures shall be provided withfootpaths:

Sl. No.	Location at km	Span ArrangementNo.x Length (m)	Remarks
Nil			

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

Refer to the provision of relevant Manual and state if there is any exception

(e) The following structures shall be designed to carry utility services specified in table below:

Sl. No.	Bridge at km	Utility service to be carried	Remarks

Sl. No.	Bridge at km	Utility service to be carried	Remarks
1	16+955	Electricity cables, OFC cables etc.	
2	18+203	Electricity cables, OFC cables etc.	
3	32+352	Electricity cables, OFC cables etc.	
4	37+341	Electricity cables, OFC cables etc.	

(f) Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in the provision of relevant Manual.

(ii) Culverts

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

(b) Reconstruction of existing culverts:

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

Sl. No.	Culvert location	Span arrangement (No. x length) (m)	Remarks, if any*
1	01+272	1 X 2	Box Cell
2	01+571	1 X 2	Box Cell
3	01+725	1 X 6	Box Cell
4	02+168	1 X 2	Box Cell
5	02+190	1 X 2	Box Cell
6	02+296	1 X 2	Box Cell
7	03+298	1 X 2	Box Cell
8	04+084	1 X 2	Box Cell
9	04+626	1 X 2	Box Cell
10	04+771	1 X 2	Box Cell
11	04+872	1 X 2	Box Cell
12	05+160	1 X 2	Box Cell
13	05+202	1 X 2	Box Cell
14	05+260	1 X 2	Box Cell
15	05+385	1 X 2	Box Cell
16	05+460	1 X 2	Box Cell
17	05+580	1 X 2	Box Cell
18	05+678	1 X 2	Box Cell
19	05+790	1 X 2	Box Cell
20	06+187	1 X 2	Box Cell
21	06+246	1 X 2	Box Cell
22	06+500	1 X 3	Box Cell
23	06+628	1 X 2	Box Cell
24	06+762	1 X 2	Box Cell
25	07+255	1 X 2	Box Cell
26	07+327	1 X 2	Box Cell
27	7+469	1 X 2	Box Cell
28	07+901	1 X 2	Box Cell
29	08+002	1 X 2	Box Cell

30	08+114	1 X 2	Box Cell
31	08+291	1 X 2	Box Cell
32	08+729	1 X 2	Box Cell
33	9+285	1 X 2	Box Cell
34	09+375	1 X 2	Box Cell
35	09+873	1 X 2	Box Cell
36	9+935	1 X 2	Box Cell
37	10+478	1 X 2	Box Cell
38	10+704	1 X 2	Box Cell
39	12+453	1 X 2	Box Cell
40	12+891	1 X 2	Box Cell
41	15+462	1 X 2	Box Cell
42	16+473	1 X 2	Box Cell
43	16+740	1 X 2	Box Cell
44	17+684	1 X 2	Box Cell
45	18+528	1 X 2	Box Cell
46	18+614	1 X 2	Box Cell
47	18+774	1 X 2	Box Cell
48	19+713	1 X 2	Box Cell
49	20+649	1 X 2	Box Cell
50	21+950	1 X 2	Box Cell
51	22+523	1 X 2	Box Cell
52	23+485	1 X 2	Box Cell
53	23+927	1 X 2	Box Cell
54	24+374	1 X 2	Box Cell
55	24+686	1 X 2	Box Cell
56	24+874	1 X 2	Box Cell
57	25+038	1 X 2	Box Cell
58	25+271	1 X 2	Box Cell
59	25+524	1 X 2	Box Cell
60	26+049	1 X 2	Box Cell
61	26+187	1 X 2	Box Cell
62	26+274	1 X 2	Box Cell
63	26+410	1 X 2	Box Cell
64	27+237	1 X 2	Box Cell
65	27+252	1 X 2	Box Cell
66	27+605	1 X 2	Box Cell
67	27+803	1 X 2	Box Cell
68	27+848	1 X 2	Box Cell
69	29+700	1 X 2	Box Cell
70	29+725	1 X 2	Box Cell
71	29+968	1 X 4	Box Cell
72	30+218	1 X 2	Box Cell
73	30+247	1 X 2	Box Cell
74	30+368	1 X 2	Box Cell
75	30+450	1 X 2	Box Cell

76	31+043	1 X 2	Box Cell
77	31+513	1 X 2	Box Cell
78	31+580	1 X 2	Box Cell
79	31+726	1 X 2	Box Cell
80	31+787	1 X 2	Box Cell
81	31+922	1 X 2	Box Cell
82	32+081	1 X 2	Box Cell
83	32+174	1 X 2	Box Cell
84	32+296	1 X 2	Box Cell
85	32+407	1 X 2	Box Cell
86	32+508	1 X 2	Box Cell
87	32+576	1 X 2	Box Cell
88	32+685	1 X 2	Box Cell
89	32+748	1 X 2	Box Cell
90	32+782	1 X 2	Box Cell
91	32+827	1 X 2	Box Cell
92	32+868	1 X 2	Box Cell
93	33+058	1 X 2	Box Cell
94	33+123	1 X 2	Box Cell
95	34+387	1 X 2	Box Cell
96	34+446	1 X 2	Box Cell
97	34+697	1 X 2	Box Cell
98	34+877	1 X 2	Box Cell
99	34+963	1 X 2	Box Cell
100	35+075	1 X 2	Box Cell
101	35+260	1 X 2	Box Cell
012	35+352	1 X 2	Box Cell
103	35+505	1 X 2	Box Cell
104	36+154	1 X 4	Box Cell
105	36+627	1 X 2	Box Cell
106	36+895	1 X 2	Box Cell
107	36+942	1 X 2	Box Cell
108	37+065	1 X 2	Box Cell
109	37+140	1 X 2	Box Cell
110	38+117	1 X 2	Box Cell
111	38+155	1 X 2	Box Cell
112	38+490	1 X 2	Box Cell
113	38+713	1 X 2	Box Cell
114	38+850	1 X 2	Box Cell
115	38+917	1 X 2	Box Cell
116	39+217	1 X 2	Box Cell
117	39+880	1 X 2	Box Cell
118	40+090	1 X 2	Box Cell
119	40+141	1 X 2	Box Cell
120	40+572	1 X 2	Box Cell
121	40+685	1 X 2	Box Cell

122	41+028	1 X 2	Box Cell
123	41+152	1 X 2	Box Cell
124	41+667	1 X 2	Box Cell
125	41+934	1 X 2	Box Cell
126	42+230	1 X 2	Box Cell
127	42+595	1 X 2	Box Cell
128	42+790	1 X 2	Box Cell

*Specify modifications, if any, required in the road level, etc.

(c) Widening of existingculverts:

All existing culverts which are not to be reconstructed shall be widened tothe roadway width of the Project Highway as per the typical cross section given in the provision of relevant Manual. Repairs and strengthening of existing structures where required shall be carried out.

Sl. No.	Culvert location	Type	Span Arrangement (No.xL)	Width of existing culvert (m)	Widening &Repairs to be carried out [specify]
1	23+053	Slab	1 X 3.5	4.5	Widening of existing culverts upto formation width of the proposed road and protection work etc.
2	24+116	Slab	1 X 3	4.5	
3	24+588	Slab	1 X 3	4.5	
4	30+592	Slab	1 X 2.12	4.5	
5	30+912	Slab	1 X 2.8	4.5	
6	33+681	Slab	1 X 2	6.5	
7	34+238	Slab	1 X 4	6.5	
8	34+282	Slab	1 X 2.4	6.5	
9	35+181	Slab	1 X 3	6.5	
10	35+665	Slab	1 X 4	6.5	
11	37+360	Slab	1 X 4	6.5	
12	39+367	Slab	1 X 4	6.5	
13	39+704	Slab	1 X 4	7.0	

(d) Additional new culverts shall be constructed as per particulars given in the tablebelow:

S.No.	Proposed Structure	Design Chainage in km	Proposed Span (No. x Length x Ht.) in m	Earth Fill
Nil				

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

Sl. No.	Location at km	Existing Span Arrangement	Type of culverts	Type of repair required
1	0+000	1 X 4	Slab	Repairs/Replacements of railing/parapet wall,
2	29+824	1 X 2.6	Pipe	

3	35+794	1 X 1.6	Pipe	headwall in Pipe culverts, flooring, and protection etc.
4	36+345	1 X 1.5	Pipe	
5	37+890	1 X 4	Slab	
6	38+537	1 X 1.5	Pipe	

(f) Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

(iii) Bridges

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

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

Sl. No.	Bridge location (km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc.*	Remarks
1	16+955	Old with Steel Truss & overall width is 5.6m	Proposed Span 1x15m & overall width 8.5m	
2	18+203	Old with Steel Truss & overall width is 5.6m	Proposed Span 1x25m & overall width 8.5m	

*Attach GAD

(ii) The following narrow bridges shall bewidened:

Sl. No.	Location (km)	Existing width (m)	Extent of widening (m)	Cross-section at deck level for widening @
Nil				

@ Attach cross-section

(b) Additional newbridges

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

Minor Bridge: -

S. No.	Design Chainage	Total Length (M)	Span Arrangement No. X length	Type of Superstructure	Deck Width (M)
Nil					

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

Sl. No.	Location at km	Remarks
Nil		

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

Sl. No.	Location at km	Repairs/Replacement
1	32+352	• Replace wearing Coat • Provide bed protection works with cut off walls, rigid & flexible apron.
2	37+341	• Damage RCC railing to be replace • Replacing of drainage spout

		• Expansion joint to be replace • Protection work behind abutment etc.

(e) Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in the provision of relevant Manual

(f) Structures in marine environment

Refer to the provision of relevant Manual and specify the necessary measures/ treatments for protecting structures in marine environment, where applicable.

(iv) Rail-road bridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in the provision of relevant Manual. [Refer to the provision of relevant Manual and specify modification, if any]

(b) Road over -bridges

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

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

(c) Road under-bridges

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

Sl. No.	Location of Level crossing (Chainage km)	Number and length of span (m)
Nil		

(v) Grade separated structures

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

(vi) 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
Nil		

(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 otherstructures

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

(vii) List ofBridges andStructures

The following is the list of the Bridges andStructures:

S. No.	Type of Structure	Design Chainage in km
1	Minor Bridge	16+955
2	Minor Bridge	18+203
3	Minor Bridge	32+352
4	Minor Bridge	37+341

9. Design of Tunnel

Nil

10. Traffic Control Devices and Road Safety Works

(i) Traffic control devices and road safety works shall be provided in accordance with the section 9 of the manual referred to in Schedule D.

(ii) Specifications of thereflectivesheetingas per IRC :67-2012 has been provided.

10.1 Crash Barrier

(a) Metal crash barrier shall be provided along the project highway as per section 9 of the manual. It shall be provided at Culvert/ bridge approaches on both sides, at location of embankment with height greater than or equal to 3m.Minimum length of the Thrie" metal beam crash barrier is 22725m as per TCS schedule.

(b) The concrete crash barrier/ railing of bridge and culvert shall be painted in black and white stripes in general.

10.2 Transverse Rumble strip

Transverse rumble strips in the form of thermoplastic bar marking shall be provided to warn the drivers to reduce the speed for safety. Stripes shall be in full width of pavement. The stripes shall be provided at sharp curves, village approaches, location approaching access road, intersections and any other hazardous locations on the project highway. Guidelines of IRC-35 shall be followed.

10.3 Road Marking and Signage

(iii) The following road marking, signage and safety devise shall be used on the project which is minimum. Further if any shall be in accordance with the section 9 of the manual referred to in Schedule D.

The minimum quantity of Traffic signages and pavement marking as per IRC: 35-2015 are tabulated here:

Main Road(Baramulla-Gulmarg)			
Sl. No.	**Traffic Signages, Road Marking and other appurtenances**	**unit**	**Quantity**
1	Road Marking: -Lines, dashes, arrows	Sq. m	17984.40
2	900 mm triangular	Nos.	1641
3	600 mm circular	Nos.	43
4	Rectangular 600x500 mm	Nos.	2542
5	Rectangular 900x450 mm	Nos.	304
6	5th Km Stone	Nos.	9
7	Ordinary Km Stone	Nos.	34
8	Hectometre Stone	Nos.	171
9	Raised Road Marker (Studs)	Nos.	10377

Main Road(Baramulla-Gulmarg)			
Sl. No.	**Traffic Signages, Road Marking and other appurtenances**	**unit**	**Quantity**
10	Boundary pillars	Nos.	428
11	Place identification (1200mmx700mm)	Nos.	6
12	Overhead sign board full width	Nos.	2

11. Roadside Furniture

Roadside furniture shall be provided in accordance with the provision of relevant Manual for **Main Road**.

(i) Delineators = 4334 Nos.

12. Compulsory Afforestation

Refer to the provision of relevant Manual and specify the number of trees which are required to be planted by the Contractor as compensatory afforestation as per IRC: SP:21-2009.

13. Hazardous Locations

The safety barriers shall also be provided at the following hazardous locations**:**

Sl. No.	Location stretch from (km) to (km)	LHS/RHS
Nil		

14. Special Requirement for Hill Road

This shall be provided accordance with section 13 of the Manual.

The side slope shall be protected by using suitable slope protection measures all along the highway on Hill side and valley side. The retaining wall/Toe wall, gabion wall and Soil nailing or Rock Bolting shall be constructed as per requirement of site condition in accordance with manual requirement. However, minimum length of protection works shall be construction as per details given below and the typical section of protection work are given in **Schedule B-1**.

a) Retaining wall/Toe wall shall be constructed with minimum length is 210m on Main Road with 1.0m to 4.0m ht. as per site condition of stone masonry in cement mortar 1:3 or any other better material acceptable to the Authority Engineer. Contractor is needed to access the same and bid accordingly.

Retaining wall / Toe Wall				
Design Chainage Km		**Length in m**	**Height Adopted in m**	**Side**
From	**To**			
2+160	2+190	30	2	LHS
12+810	12+830	20	4	RHS
41+230	41+250	20	3	LHS
2+300	2+400	100	2	RHS
6+190	6+200	10	2.5	RHS
7+300	7+330	30	2.5	RHS
Total Length in m		**210**		

b) Breast wall on hill side protection with minimum length is 720m accordance with IRC: SP: 48-1998 and IRC: 56-2011. Contractor is needed to access the same and bid accordingly.

Left Hand Side			
Design Chainage in km		**Length in m**	**Height Adopted in m**
From	**To**		

Left Hand Side			
Design Chainage in km		Length in m	Height Adopted in m
From	To		
1+810	1+830	20	4
1+900	1+910	10	4
2+250	2+280	30	7
2+320	2+370	50	4-8
2+410	2+430	20	5
2+530	2+560	30	4
2+650	2+660	10	4
2+890	2+960	70	6
7+380	7+400	20	4-6
25+380	25+450	70	4
25+850	25+960	110	4-7
26+010	26+040	30	4-5
Total Length		**470**	

Right Hand Side			
Design Chainage in km		Length in m	Height Adopted in m
From	To		
2+080	2+150	70	4-7
3+150	3+170	20	4
4+420	4+430	10	4
4+970	4+980	10	6
5+060	5+080	20	4
5+110	5+120	10	4
5+180	5+190	10	4
6+400	6+410	10	4
7+460	7+520	60	4-7
9+260	9+270	10	5
9+910	9+920	10	4
25+240	25+250	10	5
Total Length		**250**	

15. 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.

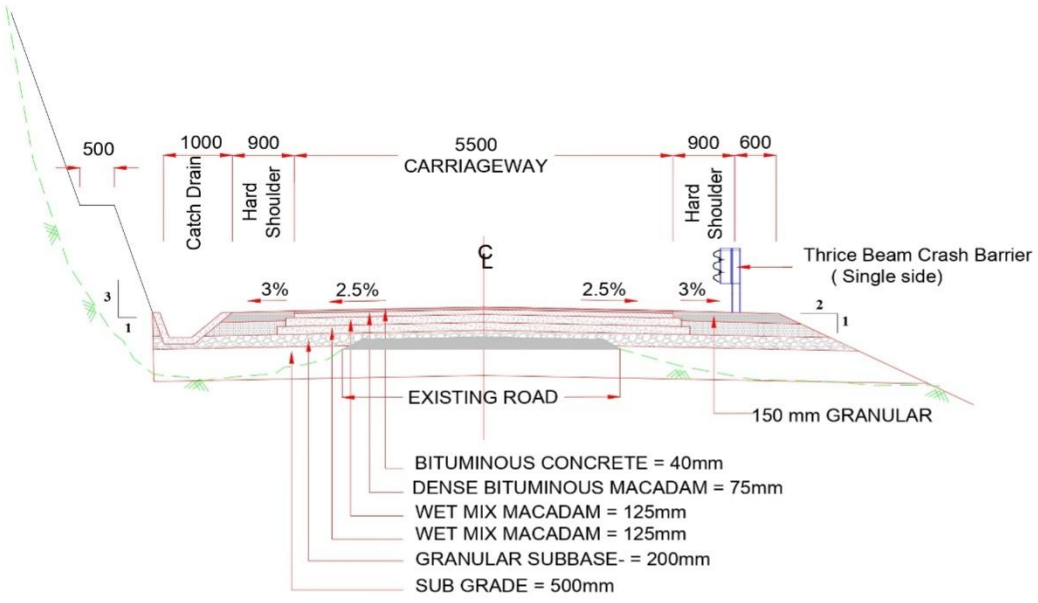
16. Chainages wise indicative widening scheme with applicable typical Cross section

Design Chainage (km)		*Design Length (m)*	*TCS Type*
From	*To*		
00+000	01+700	1700	TCS-6

Design Chainage (km)		***Design Length (m)***	***TCS Type***
From	***To***		
01+700	01+810	110	TCS-1
01+810	01+840	30	TCS-3
01+840	01+900	60	TCS-1
01+900	01+920	20	TCS-3
01+920	02+090	170	TCS-1
02+090	02+170	80	TCS-3
02+170	02+210	40	TCS-4
02+210	02+300	90	TCS-1
02+300	02+330	30	TCS-4
02+330	02+390	60	TCS-2
02+390	02+420	30	TCS-4
02+420	02+450	30	TCS-3
02+450	02+540	90	TCS-1
02+540	02+580	40	TCS-3
02+580	02+660	80	TCS-1
02+660	02+680	20	TCS-3
02+680	02+900	220	TCS-1
02+900	02+980	80	TCS-3
02+980	03+160	180	TCS-1
03+160	03+190	30	TCS-3
03+190	04+430	1240	TCS-1
04+430	04+450	20	TCS-3
04+450	04+980	530	TCS-1
04+980	05+000	20	TCS-3
05+000	05+070	70	TCS-1
05+070	05+100	30	TCS-3
05+100	05+120	20	TCS-1
05+120	05+140	20	TCS-3
05+140	05+190	50	TCS-1
05+190	05+210	20	TCS-3
05+210	06+200	990	TCS-1
06+200	06+220	20	TCS-4
06+220	06+410	190	TCS-1
06+410	06+430	20	TCS-3
06+430	07+310	880	TCS-1
07+310	07+350	40	TCS-4
07+350	07+390	40	TCS-1
07+390	07+420	30	TCS-3
07+420	07+470	50	TCS-1
07+470	07+540	70	TCS-3
07+540	08+900	1360	TCS-1
08+900	09+200	300	TCS-6

Design Chainage (km)		***Design Length (m)***	***TCS Type***
From	***To***		
09+200	09+280	80	TCS-1
09+280	09+300	20	TCS-3
09+300	09+930	630	TCS-1
09+930	09+950	20	TCS-3
09+950	12+500	2550	TCS-1
12+500	14+900	2400	TCS-6
14+900	16+948	2047.5	TCS-1
16+948	16+963	15	Minor Bridge
16+963	17+300	337.5	TCS-1
17+300	17+850	550	TCS-6
17+850	18+000	150	TCS-6
18+000	18+191	190.5	TCS-6
18+191	18+216	25	Minor Bridge
18+216	18+500	284.5	TCS-6
18+500	23+000	4500	TCS-1
23+000	23+400	400	TCS-6
23+400	25+280	1880	TCS-1
25+280	25+300	20	TCS-3
25+300	25+420	120	TCS-1
25+420	25+500	80	TCS-3
25+500	25+890	390	TCS-1
25+890	26+010	120	TCS-3
26+010	26+050	40	TCS-1
26+050	26+090	40	TCS-3
26+090	29+000	2910	TCS-1
29+000	32+349	3348.95	TCS-5
32+349	32+355	6.1	Minor Bridge
32+355	37+337	4981.95	TCS-5
37+337	37+345	8	Minor Bridge
37+345	42+820	5475	TCS-5
TOTAL DESIGN LENGTH		***42820***	

TCS of Main Road



TYPE - 1 FOR RECONSTRUCTION WITH 5.5M C/W IN MOUNTAINOUS TERRAIN WITH ONE SIDE FILL & ONE SIDE CUT

Design Chainage		Design Length	TCS Type
From	To		
1700	01+810	110	TCS-1
01+840	01+900	60	TCS-1
01+920	02+090	170	TCS-1
02+210	02+300	90	TCS-1
02+450	02+540	90	TCS-1
02+580	02+660	80	TCS-1
02+680	02+900	220	TCS-1
02+980	03+160	180	TCS-1
03+190	04+430	1240	TCS-1
04+450	04+980	530	TCS-1
05+000	05+070	70	TCS-1
05+100	05+120	20	TCS-1
05+140	05+190	50	TCS-1
05+210	06+200	990	TCS-1
06+220	06+410	190	TCS-1
06+430	07+310	880	TCS-1
07+350	07+390	40	TCS-1
07+420	07+470	50	TCS-1
07+540	08+900	1360	TCS-1
09+200	09+280	80	TCS-1
09+300	09+930	630	TCS-1
09+950	12+500	2550	TCS-1
14+900	16+948	2047.5	TCS-1
16+963	17+300	337.5	TCS-1
18+500	23+000	4500	TCS-1
23+400	25+280	1880	TCS-1
25+300	25+420	120	TCS-1
25+500	25+890	390	TCS-1
26+010	26+050	40	TCS-1
26+090	29+000	2910	TCS-1

Notes:-

1.All Dimensions are in millimeters except otherwise specified

2.Hard shoulder shall be provide where adequate amount of EROW available to place it.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	June, 2020	

CLIENT: NATIONAL HIGHWAY & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (MINISTRY OF ROAD TRANSPORT & HIGHWAY) GOVERNMENT OF INDIA

CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FI. GOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)
JV with Monarch Surveyors and Engineering Consultants Pvt.Ltd.

DRAFT DETAILED PROJECT REPORTS

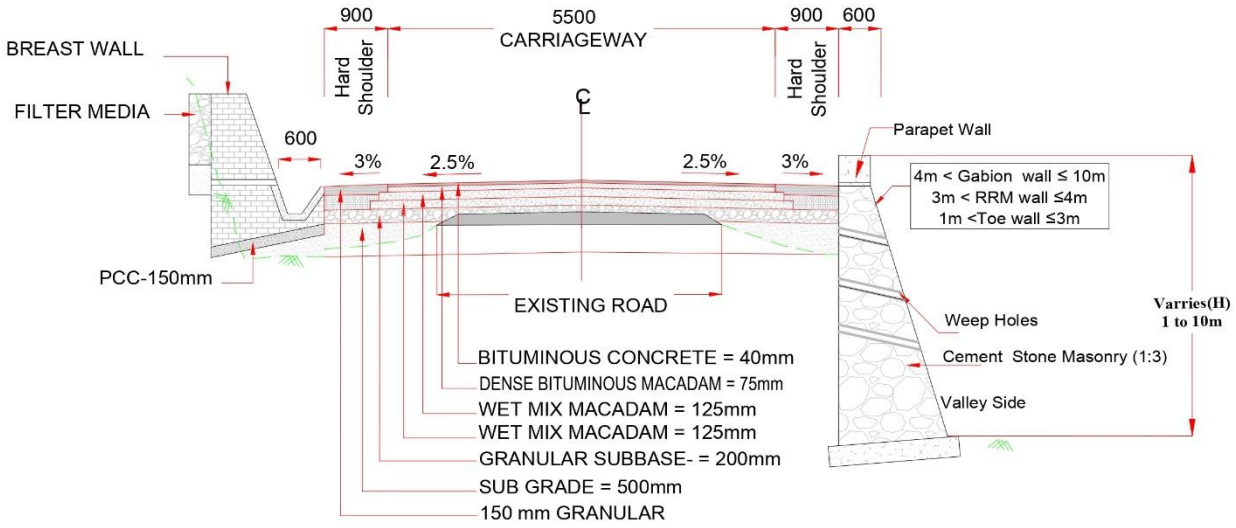
Designed / Drawn / Checked / Approved

Scale: NTS

Project: Consultancy Services for Feasibility Study, Preparation of Detailed Project Report and providing pre-construction services for 2-lane with Paved Shoulder of NH configuration for Baramulla-Gulmarg Road in the state of Jammu & Kashmir.

Drawing Title: TYPICAL CROSS SECTION

Sheet size: A2 | NHIDCL/BARAMULLA GULMARG/ TCS/01/R0



TYPE - 2 FOR RECONSTRUCTION WITH 5.5M C/W IN MOUNTAINOUS TERRAIN WITH ONE SIDE FILL & ONE SIDE CUT WITH PROTECTION WORK ON BOTH SIDE

Design Chainage		sign Leng	TCS Type
From	To		
02+330	02+390	60	TCS-2

Notes:-

1.All Dimensions are in millimeters except otherwise specified

2.Hard shoulder shall be provide where adequate amount of EROW available to place it.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	June, 2020	

CLIENT: NATIONAL HIGHWAY & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (MINISTRY OF ROAD TRANSPORT & HIGHWAY) GOVERNMENT OF INDIA

CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)
JV with Monarch Surveyors and Engineering Consultants Pvt.Ltd.

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Drawing Title: TYPICAL CROSS SECTION

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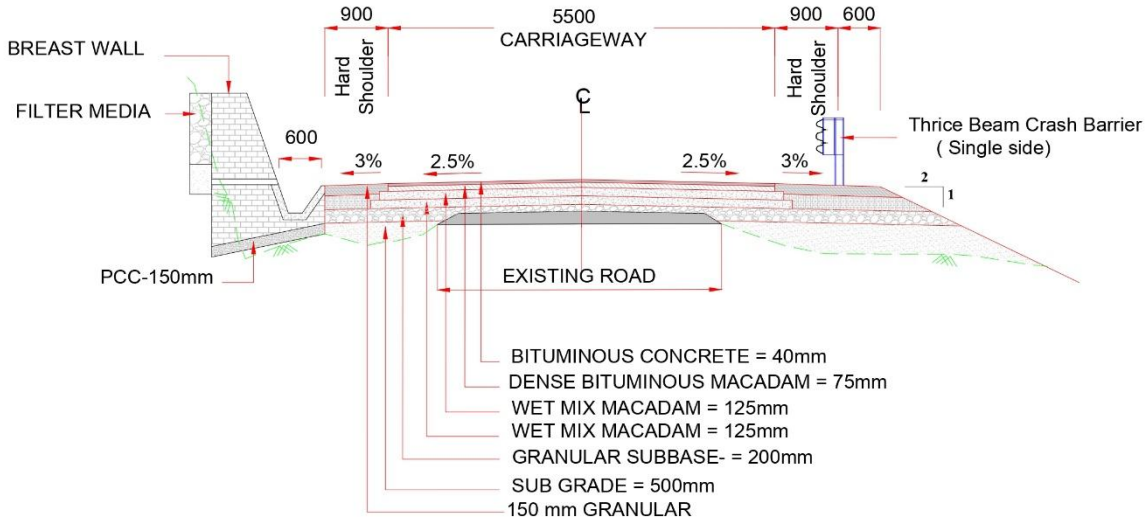

TYPE - 3 FOR RECONSTRUCTION WITH 5.5M C/W IN MOUNTAINOUS TERRAIN WITH ONE SIDE FILL & ONE SIDE CUT WITH PROTECTION WORK

Design Chainage		Design Length	TCS Type
From	To		
01+810	01+840	30	TCS-3
01+900	01+920	20	TCS-3
02+090	02+170	80	TCS-3
02+420	02+450	30	TCS-3
02+540	02+580	40	TCS-3
02+660	02+680	20	TCS-3
02+900	02+980	80	TCS-3
03+160	03+190	30	TCS-3
04+430	04+450	20	TCS-3
04+980	05+000	20	TCS-3
05+070	05+100	30	TCS-3
05+120	05+140	20	TCS-3
05+190	05+210	20	TCS-3
06+410	06+430	20	TCS-3
07+390	07+420	30	TCS-3
07+470	07+540	70	TCS-3
09+280	09+300	20	TCS-3
09+930	09+950	20	TCS-3
25+280	25+300	20	TCS-3
25+420	25+500	80	TCS-3
25+890	26+010	120	TCS-3
26+050	26+090	40	TCS-3

Notes:-

1.All Dimensions are in millimeters except otherwise specified

2.Hard shoulder shall be provide where adequate amount of EROW available to place it.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	June - 2020	

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CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)
JV with Monarch Surveyors and Engineering Consultants Pvt.Ltd.

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Drawing Title: TYPICAL CROSS SECTION

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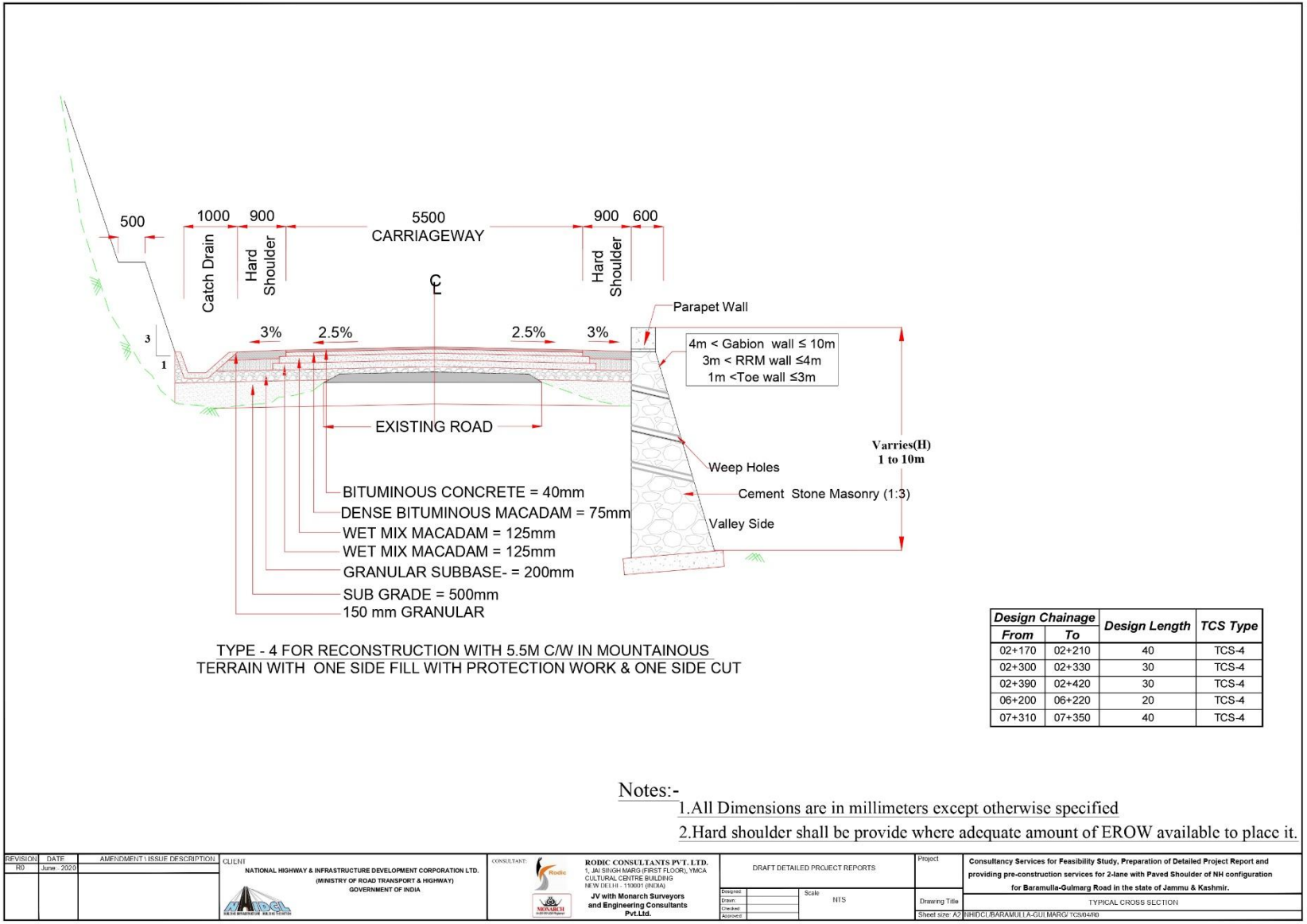

TYPE - 4 FOR RECONSTRUCTION WITH 5.5M C/W IN MOUNTAINOUS TERRAIN WITH ONE SIDE FILL WITH PROTECTION WORK & ONE SIDE CUT

Design Chainage		Design Length	TCS Type
From	To		
02+170	02+210	40	TCS-4
02+300	02+330	30	TCS-4
02+390	02+420	30	TCS-4
06+200	06+220	20	TCS-4
07+310	07+350	40	TCS-4

Notes:-

1.All Dimensions are in millimeters except otherwise specified

2.Hard shoulder shall be provide where adequate amount of EROW available to place it.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	June - 2020	

CLIENT: NATIONAL HIGHWAY & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (MINISTRY OF ROAD TRANSPORT & HIGHWAY) GOVERNMENT OF INDIA

CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA) JV with Monarch Surveyors and Engineering Consultants Pvt.Ltd.

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Drawing Title: TYPICAL CROSS SECTION

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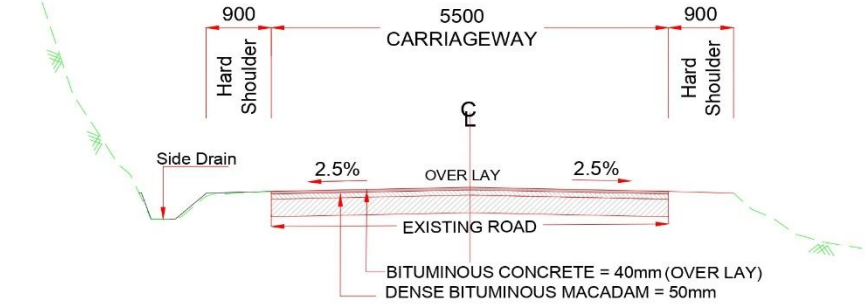


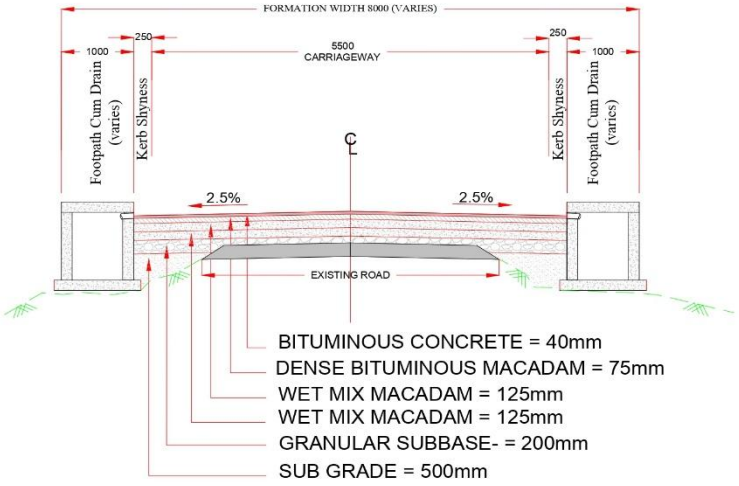
TYPE - 5 OVER LAY OF EXISTING C/W

Design Chainage		Design Length	TCS Type
From	To		
29+000	32+349	3348.95	TCS-5
32+355	37+337	4981.95	TCS-5
37+345	42+820	5475	TCS-5

Notes:-

1.All Dimensions are in millimeters except otherwise specified

2.Hard shoulder shall be provide where adequate amount of EROW available to place it.



TYPE - 6 FOR RECONSTRUCTION WITH 5.5M C/W IN BUILT UP AREA WITH BOTH SIDE RCC COVERD DRAIN

Design Chainage		Design Length	TCS Type
From	To		
0+000	1+700	1700	6
8+900	9+200	300	6
12+500	14+900	2400	6
17+300	17+850	550	6
17+850	18+000	150	6
18+000	18+191	190.5	6
18+216	18+500	285	6
23+000	23+400	400	6

Notes:-

1.All Dimensions are in millimeters except otherwise specified

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	June - 2020	

CLIENT: NATIONAL HIGHWAY & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (MINISTRY OF ROAD TRANSPORT & HIGHWAY) GOVERNMENT OF INDIA

CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)
JV with Monarch Surveyors and Engineering Consultants Pvt.Ltd.

DRAFT DETAILED PROJECT REPORTS

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Drawing Title: TYPICAL CROSS SECTION

Sheet size: A2 NHIDCL/BARAMULLA-GULMARG/TCS/05/R0

Schedule B-1

The shifting of utilities and felling of trees shall be carried out by the contractor. The cost of the same shall be borne by the Authority. The details of utilities are as follows:

Sl. No.	Type of Utility	Unit	Quantity	Location/stretch (LHS/RHS)
A	**Electrical Utilities**			
A1	Electrical poles	Nos.	265	127 LHS & 138 RHS
A2	Electrical cables	Meters	4695	
A3	Transformers	Nos.	25	13 LHS & 12 RHS
B	OFC	Nos.	191	110 LHS & 81 RHS
C	Felling of Trees	Nos.	939	
D	Hand Pump	Nos.	10	4 LHS & 6 RHS

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

(a) Toll plaza[s];

(b) truck lay-byes;

(c) bus-bays and bus shelters;

(d) rest areas

(e) rainwater harvesting; and

(f) others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

(a) Toll plaza[s]; Nil

(b) truck lay-byes; Nil

(c) bus-bays and bus shelters; Nil

(d) rest areas; Nil

(e) rainwater harvesting;-

As per Ministry of Environment and Forest notification, dated 8 October 2019 and 23 April 2010, construction of rainwater harvesting structure has been adopted accordingly.**86 nos.** of recharge shaft of 0.5 m dia. for 10 to 15 m depth one on each side of the carriageway are proposed.

(f) others to be specified:-

1) General & Environmental Items:

Environmental Monitoring Action Plan

Env. Issues/ component	Project Stage	Parameters	Method/Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision
Air Quality	Construction stage	PM 10 PM2.5SO2, NOX, CO	High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB	Active construction site, HMP site and representative sample for residential, commercial/Industrial and Sensitive Locations(Total 4 Locations)	24 hr. continuous, 4 time in year for 18 months	Air quality standard by CPCB	Contractor	NHIDCL/AE
	Operation stage			Representative sample 1each for residential, commercial/Industrialand Sensitive Locations(Total 3 Locations)-	24 hr. continuous, half year for one year	Air quality standard by CPCB	NHIDCL	NHIDCL/AE
Water Quality	Construction stage	Ground water:(IS: 10500:1991)	Grab sample collected from source and analyses as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camps, HP of residential area and surface water of Perennial Rivers/Ponds(4 Samples)	4 time in a year for18 Months	Water quality standard by CPCB	Contractor	NHIDCL/AE
	Operation stage	Surface water criteria for fresh		Groundwater at 2locations and	3 times in a year for 1	Water quality standard by	NHIDCL	NHIDCL/AE

Environmental Monitoring Action Plan

Env. Issues/ component	Project Stage	Parameters	Method/Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision
		water classification		surface water at 1 location and Nalla developed due to Borrows areas/Muck (Total 4 Samples)	year	CPCB		
Noise levels	Construction stage	Equivalent Noise levels on dB (A)scale for day and night	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-	Construction sites, Construction Camp and 1each at residential, commercial and sensitive locations along the alignment. (4 Locations) -	24 hr. continuous, 4 time in a year for 8 months	NationalAmbient NoiseStandardspecified inEnvironmentProtection Act,1986	Contractor	NHIDCL/AE
	Operation stage		1968Using Noiselevel meter	1 each at Sensitive and residential Commercial areas(3 Locations)	3 times in a year for 1 year		NHIDCL through approved monitoring agency	NHIDCL/AE
Soil Quality	Construction Stage	NPK (ICAR standard) and heavy metals	As specified by thesite engineerNHIDCL / CSC	Camp/ HMP sites Dumping Site and one random sample from agricultural Land	Once in a year for 18 months	ICAR standard	Contractor through approved monitoring agency	NHIDCL/AE
	Operation stage	Oil and grease		At oil spillage locations and other probable soil contamination location (2Locations)	Twice for the first year of operation	CPCB standard	NHIDCL	NHIDCL
Soil Erosion	Constructi			Throughout the	After first	Visual Checks	Contractor	NHIDCL/AE

Environmental Monitoring Action Plan

Env. Issues/ component	Project Stage	Parameters	Method/Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision
	on Stage			Project Corridor especially at	rain			
	Operation Stage	Visual check forSoil erosion andsiltation		Riverbanks, bridge locations and river training structures	Once during operation of 1st year	Visual Checks	Engineering Team of NHIDCL	NHIDCL
Drainage Congestion	Construction stage	Visual Checks		Throughout the Project Corridor especially Probable drainage congestion areas	Once in a year before rainy season	Non-Specific	Contractor	NHIDCL/AE
	Operation Stage				Once in a year before rainy season	Non-Specific	NHIDCL	
Solid Waste Management	Construction Stage	Entire Work Location and Camp Area	Solid waste management guideline 2000	Throughout the Stretch including construction sites, crusher Area	-	Solid waste management guideline 2000	Contractor	NHIDCL/AE
Training and Awareness	Construction Stage	Landslide Mitigation, SnowAvalanche, Earthquake or as per Suggested by AE,PMC and NHIDCL.	MORTH/MOEF Guideline	Construction Site and Camp,Near Habitant Area	Quarterly during Construction	MORTH Guideline	Contractor	NHIDCL/AE

2) **Safety and traffic management including Maintenance during construction:** In this, following items shall be considered during widening & strengthening of the existing road to intermediate lane with/without hard shoulder for maintaining the existing road for smooth movement of traffic during construction period project which is minimum.Contractor is needed to access the same and bid accordingly.

- Portable Type Barricade in Construction Zone;
- Traffic Signs for Diversion/construction zone;
- Filling of Pot- holes and Patch Repairs on existing road as per MoRT&H Specification.
- Providing, laying and rolling of built-up-spray grout layer over prepared base on existing road as per MoRT&H Standard Specification & IRC Provision;
- Maintenance of Earthen Shoulders as per MoRTH Specification
- Snow Clearance on Roads with requires equipment's like Dozer during snow period.

Schedule - D

(See 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:

Annex – I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications andStandards

All Materials works and construction operations shall conform to the Manual of Specifications and Standards for Hill Road Manual (IRC:SP: 48-1998) & Two-Laning of Highways IRC:SP:73-2018 referred to as the Manual and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority'sEngineer.

2. Deviations from the Specifications and Standards

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

(ii) 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 Specifications and Standards shall be deemed to be amended to the extent set forthbelow:

Sr. No.	Item	Clause referred in Manual	Provision as per Manual	Modified Provision
1	Design Speed	2.2.1	Mountainous and steep terrain (cross slope of the ground more than 25%) Minimum design speed 40 kmph.	The design speed shall be the minimum design speed of 40 kmph except the locations given in alignment drawing (Annex-III, Schedule A).
2	Width of Shoulders	2.6.1		These clauses are deemed to be amended as shown in the typical cross section (refer Appendix – B1 of Schedule B).
3	Roadway Width	2.7		
4	Typical Cross section	2.16		
5	Typical Cross Section	2.6.1, 2.7 and 2.16		
6	Radii of Horizontal Curve	2.9.4		
7	Radii of Horizontal Curves	2.9.4	Mountainous and steep terrain, desirable minimum radii and absolute minimum shall be 150 m and 75 m, respectively.	Mountainous and steep terrain, desirable minimum radii and absolute minimum shall be 150 m and 75 m, respectively except at the location given in alignment drawing (Annex-III, schedule A).
8	Width of New Bridge	7.3		To be amended as shown in the typical Cross section.

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

(i) The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.

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

(iii) All Materials works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

[Specify all the relevant documents]

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

(a) All damages occurring to the Project Highway on account of a Force Majeure Event or wilful default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties

Annex -I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, Approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 %of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA2003(http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 %subject to limitof0.5 sq.m for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1% ofarea	Daily	Length Measurement Unit like		2-7 days	IRC:82- 2015
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling/Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge	Nil	< 1 m for any	Daily			7- 15 days	IRC:82- 2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Deformation/ Breaking		100 m section and width<0.1 m at any location, restricted to 30 cm from the edge					
	Roughness BI	2000mm/km	2400mm/km	Bi-Annually	Class I Profilometer SCRIM(Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer: ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000-Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82- 2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82- 2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway- force	IRC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN		**traffic Speed**	Coefficient Routine			

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
of connecting road, slip roads, lay byes etc. as applicable)		36 33 32 31 31		**(Km/h)** 50 65 80 95 110	Investigation Machine or equivalent)			
Embankment/ Slope	Edge drop at shoulders	Nil	40m m	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2%variation in prescribed slope of camber/cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 %variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

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

Table -2:Maintenance Criteria for Rigid Pavements:

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L >lm. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > lm. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D =	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m.	Staple or dowel bar retrofit.

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
		depth ofslab			Within 7 days	Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, ifL> l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated withspalling	Not Applicable, as it may befull depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms And specifications - See Para 5.6.4 Within 15 days
4	**MultipleCracks intersecting with one or morejoints**	**w = width of crack**	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3pieces		
			5	w > 6 mm and/or panel broken into more than 4 pieces		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts	Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one		

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
				corner broken	Within 7 days	
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC: SP: 83-2008) Within 15 days	Full depth repair Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		
6	**Punch out (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length(m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		
7	RavellingorHoneycombtype surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term	Long Term
					No action.	Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	r = 25 - 50 %		
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs if	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
					affecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r <**2 %**	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	**Pop out (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d=50-100mm;h<50mm;n<1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d=50-100mm;h>50mm;n<1 per 5 m^2		

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5m^2		
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5m^2		
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2		
Joint Defects						
			0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length	1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	Not Applicable
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	Not Applicable
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (orStepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30days
			3	f = 6 - 12 mm	Diamond Grinding	
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	**Blow-up or Buckling**	H =vertical displacement from normal profile	0	Nil, not discernible	**Short Term**	**Long Term**
			1	h < 6 mm	No Action	
			2	h = 6 - 12 mm	Install Signs to Warn Traffic	
			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, i.e. 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	H =negative vertical displacement from	0	Not discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
		normal profile L=length	2	h = 15-30 mm, Nos<20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level	
			5	h > 100 mm	If L < 20 m. Within 30 days	
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term**	**Long Term**
					No action.	scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
17	**Bump**	H =vertical displacement from normal profile	0	h < 4 mm	No action	
			1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane toShoulder Drop-off**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term**	**Long Term**

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
					No action.	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			4	f = 50 - 75 mm		
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos Nos/100 m stretch	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	
			5	abundant, crack development >25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	Nodiscernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc. within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC SP: 84-2014, a minimum of safe stopping sight distance shall be available throughout.
Design Speed, kmph | Desirable Minimum Sight Distance (m) | Safe Stopping g g Sight Distance (m)
100 | 360 | 180
80 | 260 | 130</td><td>Monthly</td><td>Manual Measurements with Odometer along with video/image backup</td><td colspan="2">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.
In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td>IRC: SP 84-2014</td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi- Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect –within 24 hours Cat-2 Defect within 2months-</td><td>IRC:35-2015</td></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life Service Time Cement Road -130mcd/m^2/lux Bituminous Road-100mcd/m^2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months</td><td>IRC:35- 2015</td></tr>
<tr><td></td><td>Night Time Visibility</td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during night-time:</u>
Desig | (RL)Retro</td><td>Bi-Annually</td><td>As per Annexure-E</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		n Speed	Reflectivity ($mcd/m^2/lux$)						
			Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years					
		Up to 65	200	80					
		65 - 100	250	120					
		Above 100	350	150					
		Initial and Minimum Performance for Night Visibility under wet condition(Retro reflectivity):							
		Initial 7 days Retro reflectivity: 100 $mcd/m^2/lux$ Minimum Threshold Level: 50 $mcd/m^2/lux$							
	Skid Resistance	Initial and Minimum performance for Skid			Bi-Annually	As per Annexure-G		Within 24 hours	IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc.		of IRC:35-2015			
Road Signs	Shape Position and	Shape and Position as per IRC: 67- 2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is Damaged. Relocation as per requirement change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs)15 Days in case of Gantry/CantileverSign boards48 hours in case of MandatorySigns, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each Signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.			RC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC: SP:84-2014 and IRC: 35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC: SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: SP:84- 2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC: SP:84- 2014, IRC:119-2015
	End Treatment of	Functionality: Functioning ofEnd Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC: SP:84- 2014,
	Traffic Safety Barriers			backup			IRC:119- 2015
		Functionality:	Daily	Visual		Within 7 days	IRC: SP-2014,

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Attenuators	Functioning of Attenuators as intended		with video/image backup	Rectification		IRC:119- 2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:79 -1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84- 2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84- 2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84- 2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84- 2014
		Minimum 40 Lux illumination on the road	Daily	The illumination	Improvement in Lighting System	24 hours	IRC:SP:84- 2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Toll Plaza Canopy Lights	surface		level shall be measured with luxmeter			
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84- 2014
Trees and Plantation including median plantation	Obstruction in a minimum headroom of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84- 2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84- 2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction byvegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP:84-2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical,			-	Rectification	24 hours	

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	water and sanitary installations	-	Daily				
Other **Project Facilities and Approach roads**	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC: SP: 84- 2014
Pipe/box/slab culverts	Free waterway/ unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC:5-2015, IRC :SP:40-1993and IRCSP:13- 2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40- 1993 and IRC SP:69-2011

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregate length	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as perIRC:SP:40-1993.	15 days	IRC:SP:40-1993 and MORTH Specificationsclause 2800
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993and IRC:SP:13- 2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35- 1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004 & 2811.
	User safety (condition of crash barrier	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014and

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	andguardrail)			condition survey as per IRC SP: 35-1990.			IRC SP: 40-1993.
	Rusted reinforcement Spalling of concrete Delamination	Not more than 0.25 sq.m Not more than 0.50 sq.m Not more than 0.50 sq.m	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, water proofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-1999.
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30mand Every10yearsf or spans between 15 to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening structure of super	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile	Replace of expansion joint seal in	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust debris expansion or in joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specification s 2600 and IRC SP: 40-1993.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				Unit			
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/ rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs tosubstructureby grouting/guniting and micro concretingexpending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be	3 months	MORTH specification 2810andIRC SP: 40-199.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		locations per side, no rupture of reinforcement or rubber		Mobile Bridge Inspection Unit	replaced, in order to get uniform load transfer on to bearings.		
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 Using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993,IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2	IRC: SP 40-1993 and IRC: SP: 13- 2004.
		sq.m, damage to solid apron (concrete apron) not morethan1 sq.m				weeks before onset of rainy season whicheveris earlier.	
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of thecontractor.							

Table 4: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(b)	**Granular earth shoulders, side slopes, drains and culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi- urban areas	24 (twenty-four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Roadside furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 (forty-eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 (twenty-four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty-four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty-four) hours
(g)	**[TollPlaza]**	
(h)	**Other Project Facilities and Approach roads**	

(i)	Damage in approach roads, pedestrian facilities, truck lay-byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobilecrane	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/ scaling Temporarymeasures Permanentmeasures	within 48 (forty-eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	
(i)	Scouring and/or cavitation	15 (fifteen) days
(c)	**Piers, abutments, return walls and wingwalls**	
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d)	**Bearings (metallic) ofbridges**	
(i)	Deformation, damages, tilting or shifting ofbearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15 (fifteen) days
(f)	**Otheritems**	
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guidebunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	**HillRoads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty-four) hours

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

Schedule - F

(See Clause 4.1 (vii) (a))

Applicable Permits

1. Applicable Permits

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

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

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

(c) Licence for use of explosives;

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

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

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

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

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

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

(ii) Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of thisAgreement.

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

[MD,

National Highways & Infrastructure Development Corporation Limited, New Delhi] WHEREAS:

(A) ____[name and address of contractor] (Hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the Strengthening & upgradation to intermediate lane from km 0+000 to km 42+820 of length 42.820km on Baramulla-Gulmarg section of NationalHighway No. 701Ain Union Territory of Jammu & Kashmir on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

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

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

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

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

2. AletterfromtheAuthority,underthehandofanofficernotbelowtherankof[General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all orany of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

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

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

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

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

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

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

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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

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

NOTES:

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

signing the guarantee.

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

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

[MD,

National Highways & Infrastructure Development Corporation Limited, New Delhi] WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for upgradation to intermediate lane in Union Territory of Jammu & Kashmir on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% advance payment (herein after called"**AdvancePayment**")equalto10%(tenpercent)oftheContractPrice;and that the Advance Payment shall be made in two instalments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} instalment of the Advance Payment is Rs. ------ cr. (Rupees crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the **"Guarantee Amount")** [$]**.**

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

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

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

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

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

3. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed

against the Contractor before presenting to the Bank its demand under this Guarantee.

$ The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

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

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

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

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

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

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

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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

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

NOTES:

(i) Thebankguaranteeshouldcontainthename,designationandcodenumberofthe officer(s) signing theguarantee.

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

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

Schedule - H

See Clauses10.1 (iv) and 19.3

Contract Price Weightages

1.1 The Contract Price for this Agreement is **Rs.115.63 Crores**

1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specifiedbelow:

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
Road works including culverts, widening and repair of culverts.	**69.456%**	**A- Widening and strengthening of existing road to intermediate lane**	
		(1) Earthwork up to top of sub-grade	11.933%
		(2) Sub-Base Course	14.370%
		(3) Non-Bituminous Base Course	12.877%
		(4) Bituminous Base Course	17.837%
		(5) Wearing Coat	12.118%
		(6) Widening and repair of culverts	2.798%
		D - Re-Construction and New culverts on existing road, realignments, bypasses:	
		(1) Culverts (length < 6m)	28.067%
Minor Bridges/ Underpasses/Overpasses	**2.527%**	**A.1-Widening and repair of minor bridges (length > 6m and < 60m)**	
		Minor Bridges	4.741%
		A.2- New minor bridges/ Viaduct	
		(i) Foundation +Sub- Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	68.398%
		(ii) Super-structure: On completion of the superstructure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	24.750%
		(iii) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	2.111%
Other Works	**28.017%**	(i) Toll plaza	
		(ii) Roadside drains i.e. RCC covered, Catch/Earthen drain etc.	35.046%
		(iii) Road signs, markings, km stones, safety devices, …	15.765%
		(iv) Project Facilities	

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		a) Bus bays	0.000%
		b) Truck lay-byes	0.000%
		c) Rest area	0.000%
		d) others	0.000%
		1. Junction Improvement	8.774%
		2. Rainwater harvesting	1.057%
		(v) Roadside plantation	0.431%
		(vi) Protection works other than approaches to the bridges, elevated sections/flyovers/grade separators and ROBs/RUBs (Retaining wall/Toe wall	1.903%
		(vii) Slope Protection (Hill Side) by Breast wall/ Gabion Wall	4.794%
		(viii) Thrie beam Crash barrier at valley side/curve location etc.	23.935%
		(ix) General Environmental items as scope define Schedule -C	1.014%
		(x) Safety and traffic management including maintenance of the existing road during construction as Scope define is Schedule-C	7.281%

1.3 Procedure of estimating the value of work done

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage - Weightage	Payment Procedure
A - Widening and strengthening of existing road to intermediate lane		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10% of total length.
(1) Earthwork up to top of the sub-grade	11.933%	
(2) Sub-base Course	14.370%	
(3) Non-Bituminous Course	12.877%	
(4) Bituminous Base Course	17.837%	
(5) Wearing Coat	12.118%	
6) Widening and repair of culverts	2.798%	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of at least two culverts.
D - Re-Construction and New culverts on existing road, realignments, bypasses:		
(1) Culverts (length < 6m)	28.067%	Cost of each culvert shall be determined on pro rata basis with

Stage of Payment	Percentage - Weightage	Payment Procedure
		respect to the total number of culverts. Payment shall be made on the completion of at least 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.

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1-Widening and repair of minor bridges (length > 6m and < 60m)	4.741%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge.
A.2- New minor bridges		
(i) Foundation +Sub- Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	68.398%	**(i) Foundation +Sub- Structure**: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation + sub-structure 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 up to abutment/pier cap level of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Super-structure: On completion of the superstructure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	24.750%	**(ii) Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(iii) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	2.111%	**(iii) 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

Stage of Payment	Weightage	Payment Procedure
1	2	3
		column of "Stage of Payment" in this sub-clause.

1.3.3 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.3.

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
(i) Toll plaza	0.000%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(ii) Road-side drains	35.046%	Unit of measurement is linear length in km./Nos./sqm Payment shall be made on prorate basis on completion of a stage in a length of not less than 10 % (ten per cent) of the scope of work.
(iii) Road signs, markings, km stones, safety devices, …	15.765%	
(iv) Project Facilities		
a) Bus bays	0.000%	Payment shall be made on pro rata basis for completed facilities.
b) Truck lay-byes	0.000%	
c) Rest areas	0.000%	
d) other	0.000%	
1. Junction Improvement	8.774%	Unit of measurement is in total Nos. of Junctions/Rainwater Harvesting. Payment shall be made on prorate basis on the completion of at least two nos. Junctions/Rainwater Harvesting
2. Rainwater harvesting	1.057%	
(v) Roadside plantation	1.480%	Unit of measurement is linear length.
(vi) protection works other than approaches to the bridges, elevated sections, and ROBs/RUBs (Retaining wall/Toe wall)	1.903%	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(vii) Slope Protection (Hill Side) i.e. Breast wall	4.794%	
(viii) Thrie beam Crash barrier at valley side/curve location etc.	23.935%	
(ix) General Environmental items as per Schedule-C	1.014%	Payment shall be made on pro rata basis every quarterly.
(x) Safety and traffic management including maintenance of the existing road during construction	7.281%	

2. Procedure for payment for Maintenance

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

2.2 Payment for Maintenance shall be made in quarterly instalments in accordance with the

provisions of Clause 19.7.

Schedule - I

(See Clause 10.2 (iv))

Drawings

1. Drawings

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

2. Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

1. The Project drawings, as defined in Clause 1.1, Definitions, Article 1, Definitions and Interpretation, Part-I: Preliminary, of the Contract Agreement shall consist:

   (a) Working Drawings of all the components/elements of the Project as determined by Authority Engineer/Authority, and

   (b) As-built drawings for the Project components/elements as determined by AE/Authority. As-built drawings shall be duly certified by Authority Engineer.

2. A minimum list of the drawings of the various components/elements of the Project and project facilities required to be submitted by the Contractor is given below:

A. BRIDGE

General Arrangement Drawing
Detailed Drawings of Structures/Bridges

B. ROAD (PLAN & PROFILE)

Plan & Profile
Cross Sections
Drawings of horizontal alignment, vertical profile and cross sections
Drawings of cross drainage works
Drawings of traffic diversion plans and traffic control measures
Drawings of road drainage measures
Drawings of typical details slope protection measures
Drawings of landscaping and horticulture
Drawings of street lighting

C. STANDARD DRAWINGS

Detail of Mandatory Regulatory Signs
Detail of Mandatory Regulatory Signs & Compulsory Direction Control and Other Signs
Detail of Informatoy Signs
Detail of Cautionary Signs-TS
Detail of cautionary warning signs
Detail of cautionary warning signs
Details of route marking (chevron marking)
Details of road marking
Details of directional signs
Details Toe drain
Details of pitching, filter material, chute drain and energy dissipation basin-std
Details of double head metal beam crash barrier
Details for 200meter 1 km & km post
Detail for boundary stone & guard post
Drain retaining wall & kerb
Gabion wall

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. Project CompletionSchedule

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

2. ProjectMilestone-I

(i) Project Milestone-I shall occur on the date falling on the **190th**(OneHundred and Ninety) day from the Appointed Date (the "**Project Milestone-I**").

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

3. ProjectMilestone-II

(i) Project Milestone-II shall occur on the date falling on the **327th**(Three Hundred and Twenty-Seven) day from the Appointed Date (the "Project Milestone- II").

(ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty-five per cent) of the Contract Price and should have started construction of all bridges.

4. Project Milestone-III

(i) Project Milestone-III shall occur on the date falling on the **460th** (Four Hundred & Sixty) day from the Appointed Date (the "Project Milestone- III").

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price and should have started construction of all project facilities.

5. Scheduled Completion Date

(i) The Scheduled Completion Date shall occur on the **545th** (Five Hundred and Forty-Five) day from the Appointed Date.

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

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

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

2. Tests

A. Road and Bridge

(i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].

(ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.

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

(iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5,but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

B. Other Tests

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

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

5. The Authority Engineer will carry out tests with following equipment at his own cost in the presence of contractor's representative.

S.N.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface of defects pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer(FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit(MBU)	At least twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the state basis rainy season)

The first testing with the help of NSV shall be conducted at the time of issue of Completion Certificate.

Schedule - L

(See Clause 12.2)

Completion Certificate

1 I, …….. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated.....(the "**Agreement**"), for Strengthening & up gradation to intermediate lane from km 0+000 to km 42+820 of length 42.820km on Baramulla-Gulmarg section of National Highway No. 701A in Union Territory of Jammu & Kashmir (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through.....(Name of Contractor),hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

Date for which was the ……. day of …….20…..

SIGNED, SEALED ANDDELIVERED

For and on behalf of the Authority's Engineer by:

(Signature)

(Name) (Designation)(Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

(i) Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth inSchedule-E.

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

(iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph2.

2. Percentage reductions in lump sum payments on monthly basis

(i) The following percentages shall govern the paymentreduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerb, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th kmstones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

(ii) The amount to be deducted from monthly lump-sum payment for non- compliance of particular item shall be calculated asunder:

Where,

P= Percentage of particular item/Defect/deficiency fordeduction

M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule L1= Non-complying length L = Total length of the road,

R= Reduction (the amount to be deducted for non-compliance for a particular item/Defect/deficiency

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority'sEngineer

(i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority'sEngineer.

(ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of thisSchedule-N.

2. Terms ofReference

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

3. Appointment of Government entity as Authority'sEngineer

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

Annex – I

(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

(i) TheseTermsofReference(the"**TOR**")fortheAuthority'sEngineerarebeingspecified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been enteredintobetweenthe[nameandaddressoftheAuthority](the"**Authority**")and..... (the "**Contractor**")# for Strengthening &upgradation tointermediate lane from km 0+000 to km 42+820 of length 42.820km on Baramulla-Gulmarg section of NationalHighway No. 701A in Union Territory of Jammu & Kashmir on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

- In case the bid of Authority's Engineer is invited simultaneously with the bid of EPC project, then the status of bidding of EPC project only to be indicated

(ii) The TOR shall apply to construction and maintenance of the ProjectHighway.

2. Definitions and interpretation

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

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

(iii) The rules of interpretation stated in Article 1 of the Agreement shall apply, mutatis mutandis, to thisTOR.

3. General

(i) The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good IndustryPractice.

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

(e) any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party.

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

(iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however,

that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

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

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

4. Construction Period

(i) During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

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

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

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

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

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

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

(ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement

and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to GoodIndustry Practice for quality assurance.

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

(xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

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

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

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

(xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

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

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

(xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

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

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

(iii) The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in thisbehalf.

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

(v) The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause14.5.

6. Determination of costs and time

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

(ii) TheAuthority'sEngineershalldeterminetheperiodofTimeExtensionthatisrequired to be determined by it under theAgreement.

(iii) The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause18.5.

7. Payments

(i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2 (iv)(d).

(ii) Authority's Engineer shall-

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

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

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

(iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause19.16.

8. Other duties and functions

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

9. Miscellaneous

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

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

(iii) Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-builtsurveyillustratingthelayoutoftheProjectHighwayandsetbacklines,ifany,ofthe buildingsandstructures forming partof ProjectFacilities;and shall hand themoverto the Authority against receiptthereof.

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

(v) TheAuthority'sEngineershallinformtheAuthorityandtheContractorofanyeventof Contractor's Default within one week of itsoccurrence.

Schedule - O

(See Clauses 19.4 (i), 19.6 (i), and 19.8 (i))

Forms of Payment Statements

1. Stage Payment Statement forWorks

The Stage Payment Statement for Works shall state:

(a) theestimatedamountfortheWorksexecutedinaccordancewithClause19.3

(i) subsequent to the lastclaim;

(b) amounts reflecting adjustments in price for the aforesaidclaim;

(c) the estimated amount of each Change of Scope Order executed subsequent to the lastclaim;

(d) amountsreflectingadjustmentinprice,ifany,for(c)aboveinaccordancewith the provisions of Clause 13.2 (iii)(a);

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

(f) Deductions:

i. Any amount to be deducted in accordance with the provisions of the Agreement excepttaxes;

ii. Any amount towards deduction of taxes;and

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

(g) Net claim: (e) – (f)(iii);

(h) The amounts received by the Contractor upto the lastclaim:

i. For the Works executed (excluding Change of Scopeorders);

ii. For Change of Scope Orders,and

iii. Taxesdeducted

2. Monthly Maintenance PaymentStatement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work notdone;

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

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

(e) amount towards deduction oftaxes

3. Contractor's claim forDamages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during ConstructionPeriod

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

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

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

(ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercialterms.

2. Insurance for Contractor's DefectsLiability

The Contractor shall effect and maintain insurance cover of not less than 15% of the Contract Price for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage toproperty

(i) The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number ofoccurrences.

The insurance cover shall be not less than: Rs. 2,00,00,000/- (Two Crore only)

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

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

(b) damage which is an unavoidable result of the Contractor's obligations to execute theWorks.

4. Insurance to be in jointnames

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

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Qualitytest

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [2,200 (two thousand and two hundred only)] mm for each kilometer.

2. Visual and physicaltest

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include measurement of cracking, rutting, stripping and potholes and shall be as per the requirement of maintenance mentioned in Schedule-E.

Schedule-R

(See Clause 14.10)

Taking Over Certificate

I, …….. (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated …… (the "**Agreement**"), for Strengthening &upgradation to intermediate lane from km 0+000 to km 42+820 of length 42.820km on Baramulla-Gulmarg section of NationalHighway No. 701A in Union Territory of Jammu & Kashmir (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through(NameofContractor),herebycertifythattheTestsoncompletionofMaintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED ANDDELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

****** End of the Document *******