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Schedules

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1. The Site

1.1 2-lane/2-lane with paved Shoulder shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

1.3 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 8.2.1 of this Agreement.

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

1.5 The status of the environment clearances obtained or awaited is given in Annex - IV.

Annexure - I

(Schedule-A)

Site

Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-I. All the chainages/location referred to in Annex-I to Schedule A shall be existing chainages.

1. Site

The Site of the Two-Lane with paved shoulder Project Highway comprises the section of National Highway-07 (Old NH-58) from Lameri to Karanprayag at Km 368.000 to km. 399.000 (Excluding Km. 379.100 to Km 380.275) in the State of Uttarakhand. The land, carriageway and structures comprises the Site are described below.

2. Land

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

Sl. No.	Existing Chainage (km)		ROW (m)
	From	To	
1	368+000	369+000	6 to 8
2	369+000	370+000	6 to 9
3	370+000	371+000	6 to 8
4	371+000	372+000	6 to 8
5	372+000	373+000	6 to 8
6	373+000	374+000	6 to 8
7	374+000	375+000	6 to 8
8	375+000	376+000	6 to 10
9	376+000	377+000	6 to 10
10	377+000	378+000	6 to 10
11	378+000	379+000	6 to 8
12	379+000	380+000	6 to 8

Sl. No.	Existing Chainage (km)		ROW (m)
	From	To	
13	380+000	381+000	6 to 8
14	381+000	382+000	6 to 8
15	382+000	383+000	6 to 8
16	383+000	384+000	6 to 12
17	384+000	385+000	6 to 12
18	385+000	386+000	6 to 12
19	386+000	387+000	6 to 12
20	387+000	388+000	6 to 12
21	388+000	389+000	6 to 12
22	389+000	390+000	6 to 12
23	390+000	391+000	6 to 12
24	391+000	392+000	6 to 12
25	392+000	393+000	6 to 12
26	393+000	394+000	6 to 12
27	394+000	395+000	6 to 12
28	395+000	396+000	6 to 12
29	396+000	397+000	6 to 12
30	397+000	398+000	6 to 12
31	398+000	399+000	6 to 12

3. Carriageway

The present carriageway of the Project Highway is of. Single Lane/Intermediate lane/two lane. The type of the existing pavement is flexible as per following details;

Existing Chainage (km)		Width (m)
From	To	
368+000	368+050	4.50
368+050	368+100	5.20
368+100	368+150	4.30
368+150	368+200	4.50
368+200	368+250	4.30
368+250	368+300	3.80
368+300	368+350	3.80
368+350	368+400	4.80
368+400	368+450	4.70
368+450	368+500	4.40
368+500	368+550	4.90
368+550	368+600	4.90
368+600	368+650	4.60
368+650	368+700	3.70
368+700	368+750	3.90
368+750	368+800	4.40
368+800	368+850	4.20
368+850	368+900	4.90
368+900	368+950	4.60
368+950	369+000	4.70
369+000	369+050	5.40
369+050	369+100	5.40
369+100	369+150	5.00
369+150	369+200	8.00
369+200	369+250	4.00
369+250	369+300	4.40
369+300	369+350	5.30
369+350	369+400	6.30
369+400	369+450	4.20
369+450	369+500	4.30
369+500	369+550	4.00
369+550	369+600	4.30
369+600	369+650	4.70
369+650	369+700	5.00
369+700	369+750	7.00
369+750	369+800	7.00
369+800	369+850	7.00
369+850	369+900	5.00
369+900	370+000	6.00
370+000	370+050	4.90
370+050	370+100	3.50
370+100	370+150	5.00
370+150	370+200	5.70
370+200	370+250	4.00
370+250	370+300	5.50

Existing Chainage (km)		Width (m)
370+300	370+350	5.00
370+350	370+400	5.00
370+400	370+450	4.80
370+450	370+500	5.00
370+500	370+550	5.10
370+550	370+600	4.40
370+600	370+650	4.80
370+650	370+700	5.50
370+700	370+750	4.70
370+750	370+800	5.50
370+800	370+850	5.10
370+850	370+900	4.50
370+900	370+950	4.40
370+950	371+000	4.60
371+000	371+050	5.00
371+050	371+100	5.50
371+100	371+150	4.50
371+150	371+200	5.00
371+200	371+250	5.00
371+250	371+300	6.80
371+300	371+350	6.80
371+350	371+400	5.00
371+400	371+450	5.00
371+450	371+500	5.20
371+500	371+550	4.80
371+550	371+600	5.00
371+600	371+650	4.90
371+650	371+700	5.20
371+700	371+750	6.00
371+750	371+800	4.50
371+800	371+850	5.10
371+850	371+900	5.00
371+900	371+950	6.00
372+000	372+050	7.00
372+050	372+100	7.20
372+100	372+150	4.90
372+150	372+200	5.00
372+200	372+250	5.30
372+250	372+300	8.00
372+300	372+350	5.50
372+350	372+400	5.60
372+400	372+450	6.80
372+450	372+500	8.20
372+500	372+550	5.00
372+550	372+600	5.20
372+600	372+650	6.20

Existing Chainage (km)		Width (m)
372+650	372+700	5.00
372+700	372+750	5.80
372+750	372+800	4.50
372+800	372+850	5.40
372+850	372+900	5.00
372+900	372+950	4.80
373+000	373+050	5.20
373+050	373+100	4.00
373+100	373+150	5.00
373+150	373+200	5.20
373+200	373+250	4.90
373+250	373+300	5.00
373+300	373+350	4.90
373+350	373+400	4.90
373+400	373+450	4.70
373+450	373+500	4.50
373+500	373+550	4.80
373+550	373+600	4.70
373+600	373+650	6.40
373+650	373+700	5.50
373+700	373+750	4.60
373+750	373+800	4.90
373+800	373+850	5.00
373+850	373+900	5.00
373+900	373+950	6.90
373+950	374+000	6.50
374+000	374+050	9.00
374+050	374+100	9.00
374+100	374+150	9.00
374+150	374+200	9.00
374+200	374+250	9.00
374+250	374+300	9.00
374+300	374+350	9.00
374+350	374+400	9.00
374+400	374+450	9.00
374+450	374+500	9.00
374+500	374+550	9.00
374+550	374+600	9.00
374+600	374+650	9.00
374+650	374+700	9.00
374+700	374+750	9.00
374+750	374+800	9.00

Existing Chainage (km)		Width (m)
374+800	374+850	9.00
374+850	374+900	9.00
374+900	374+950	9.00
374+950	375+000	9.00
375+000	375+050	9.00
375+050	375+100	9.00
375+100	375+150	9.00
375+150	375+200	9.00
375+200	375+250	9.00
375+250	375+300	9.00
375+300	375+350	9.00
375+350	375+400	9.00
375+400	375+450	9.00
375+450	375+500	9.00
375+500	375+550	9.00
375+550	375+600	9.00
375+600	375+650	9.00
375+650	375+700	9.00
375+700	375+750	9.00
375+750	375+800	9.00
375+800	375+850	9.00
376+000	376+050	9.00
376+050	376+100	9.00
376+100	376+150	9.00
376+150	376+200	9.00
376+200	376+250	9.00
376+250	376+300	9.00
376+300	376+350	9.00
376+350	376+400	9.00
376+400	376+450	9.00
376+450	376+500	9.00
376+500	376+550	9.00
376+550	376+600	9.00
376+600	376+650	9.00
376+650	376+700	9.00

Existing Chainage (km)		Width (m)
376+700	376+750	9.00
376+750	376+800	9.00
376+800	376+850	9.00
377+000	377+050	9.00
377+050	377+100	9.00
377+100	377+150	9.00
377+150	377+200	9.00
377+200	377+250	9.00
377+250	377+300	9.00
377+300	377+350	9.00
377+350	377+400	9.00
377+400	377+450	9.00
377+450	377+500	9.00
377+500	377+550	9.00
377+550	377+600	9.00
377+600	377+650	9.00
377+650	377+700	9.00
377+700	377+750	9.00
377+750	377+800	9.00
377+800	377+850	9.00
377+850	377+900	9.00
377+900	377+950	9.00
378+000	378+050	9.00
378+050	378+100	9.00
378+100	378+150	9.00
378+150	378+200	9.00
378+200	378+250	9.00
378+250	378+300	9.00
378+300	378+350	9.00
378+350	378+400	9.00
378+400	378+450	9.00
378+450	378+500	9.00
378+500	378+550	9.00
378+550	378+600	9.00
378+600	378+650	9.00

Existing Chainage (km)		Width (m)
378+650	378+700	9.00
378+700	378+750	9.00
378+750	378+800	9.00
378+800	378+850	9.00
378+850	378+900	9.00
378+900	378+385	9.00
379+000	379+050	9.00
379+050	379+100	9.00
379+100	379+150	9.00
379+150	379+200	9.00
379+200	379+250	9.00
379+250	379+300	9.00
379+300	379+350	9.00
379+350	379+400	9.00
379+400	379+450	9.00
379+450	379+500	9.00
379+500	379+550	9.00
379+550	379+600	9.00
379+600	379+650	9.00
379+650	379+700	9.00
379+700	379+750	9.00
379+750	379+800	9.00
379+800	379+850	9.00
379+850	379+900	9.00
379+900	379+950	9.00
379+950	380+000	9.00
380+000	380+050	9.00
380+050	380+100	9.00
380+100	380+150	9.00
380+150	380+200	9.00
380+200	380+250	9.00
380+250	380+300	9.00
380+300	380+350	9.00
380+350	380+400	9.00
380+400	380+450	9.00

Existing Chainage (km)		Width (m)
380+450	380+500	9.00
380+500	380+550	9.00
380+550	380+600	9.00
380+600	380+650	9.00
380+650	380+700	9.00
380+700	380+750	9.00
380+750	380+800	9.00
380+800	380+850	9.00
380+850	380+900	9.00
380+900	380+950	9.00
381+000	381+050	9.00
381+050	381+100	9.00
381+100	381+150	9.00
381+150	381+200	9.00
381+200	381+250	9.00
381+250	381+300	9.00
381+300	381+350	9.00
381+350	381+400	9.00
381+400	381+450	9.00
381+450	381+500	9.00
381+500	381+550	9.00
381+550	381+600	9.00
381+600	381+650	9.00
381+650	381+700	9.00
381+700	381+750	9.00
381+750	381+800	9.00
381+800	381+850	9.00
381+850	381+900	9.00
381+900	381+925	9.00
382+000	382+050	9.00
382+050	382+100	9.00
382+100	382+150	9.00
382+150	382+200	9.00
382+200	382+250	9.00
382+250	382+300	9.00

Existing Chainage (km)		Width (m)
382+300	382+350	9.00
382+350	382+400	9.00
382+400	382+450	9.00
382+450	382+500	9.00
382+500	382+550	9.00
382+550	382+600	9.00
382+600	382+650	9.00
382+650	382+700	9.00
382+700	382+750	9.00
382+750	382+800	9.00
382+800	382+850	9.00
382+850	382+900	9.00
382+900	382+950	9.00
382+950	383+000	9.00
383+000	383+050	9.00
383+050	383+100	7.00
383+100	383+150	7.00
383+150	383+200	7.00
383+200	383+250	7.00
383+250	383+300	7.00
383+300	383+350	7.00
383+350	383+400	7.00
383+400	383+450	7.00
383+450	383+500	7.00
383+500	383+550	7.00
383+550	383+600	7.00
383+600	383+650	7.00
383+650	383+700	7.00
383+700	383+750	7.00
383+750	383+800	7.00
383+800	383+850	7.00
383+850	383+900	7.00
383+900	383+950	7.00
383+950	384+000	7.00
384+000	384+050	7.00
384+050	384+100	7.00
384+100	384+150	7.00
384+150	384+200	7.00
384+200	384+250	7.00
384+250	384+300	7.00
384+300	384+350	7.00
384+350	384+400	7.00
384+400	384+450	7.00
384+450	384+500	7.00
384+500	384+550	7.00
384+550	384+600	7.00

Existing Chainage (km)		Width (m)
384+600	384+650	7.00
384+650	384+700	7.00
384+700	384+750	7.00
384+750	384+800	7.00
384+800	384+850	7.00
384+850	384+900	7.00
384+900	384+950	7.00
384+950	385+000	7.00
385+000	385+050	7.00
385+050	385+100	7.00
385+100	385+150	7.00
385+150	385+200	7.00
385+200	385+250	7.00
385+250	385+300	7.00
385+300	385+350	7.00
385+350	385+400	7.00
385+400	385+450	7.00
385+450	385+500	7.00
385+500	385+550	7.00
385+550	385+600	7.00
385+600	385+650	7.00
385+650	385+700	7.00
385+700	385+750	7.00
385+750	385+800	7.00
385+800	385+850	7.00
385+850	385+900	7.00
385+900	385+950	7.00
385+950	386+000	7.00
386+000	386+050	7.00
386+050	386+100	7.00
386+100	386+150	7.00
386+150	386+200	7.00
386+200	386+250	7.00
386+250	386+300	7.00
386+300	386+350	7.00
386+350	386+400	7.00
386+400	386+450	7.00
386+450	386+500	7.00
386+500	386+550	7.00
386+550	386+600	7.00
386+600	386+650	7.00
386+650	386+700	7.00
386+700	386+750	7.00
386+750	386+800	7.00
386+800	386+850	7.00
386+850	386+900	7.00
386+900	386+950	7.00
386+950	387+000	7.00
387+000	387+050	7.00
387+050	387+100	7.00
387+100	387+150	7.00
387+150	387+200	7.00
387+200	387+250	7.00

Existing Chainage (km)		Width (m)
387+250	387+300	7.00
387+300	387+350	7.00
387+350	387+400	7.00
387+400	387+450	7.00
387+450	387+500	7.00
387+500	387+550	7.00
387+550	387+600	7.00
387+600	387+650	7.00
387+650	387+700	7.00
387+700	387+750	7.00
387+750	387+800	7.00
387+800	387+850	7.00
387+850	387+900	7.00
387+900	387+950	7.00
387+950	388+000	7.00
388+000	388+050	7.00
388+050	388+100	7.00
388+100	388+150	7.00
388+150	388+200	7.00
388+200	388+250	7.00
388+250	388+300	7.00
388+300	388+350	7.00
388+350	388+400	7.00
388+400	388+450	7.00
388+450	388+500	7.00
388+500	388+550	7.00
388+550	388+600	7.00
388+600	388+650	7.00
388+650	388+700	7.00
388+700	388+750	7.00
388+750	388+800	7.00
388+800	388+850	7.00
388+850	388+900	7.00
388+900	388+950	7.00
388+950	389+000	7.00
389+000	389+050	7.00
389+050	389+100	7.00
389+100	389+150	6.60
389+150	389+200	6.50
389+200	389+250	7.80
389+250	389+300	7.50
389+300	389+350	9.00
389+350	389+400	8.80
389+400	389+450	10.20
389+450	389+500	10.60
389+500	389+550	10.60
389+550	389+600	6.50
389+600	389+650	7.00
389+650	389+700	7.00
389+700	389+750	7.20
389+750	389+800	7.50

Existing Chainage (km)		Width (m)
389+800	389+850	8.00
389+850	389+900	8.20
389+900	389+950	7.90
390+000	390+050	9.80
390+050	390+100	9.20
390+100	390+150	8.80
390+150	390+200	7.40
390+200	390+250	7.30
390+250	390+300	7.50
390+300	390+350	7.40
390+350	390+400	7.90
390+400	390+450	7.80
390+450	390+500	7.90
390+500	390+550	8.00
390+550	390+600	7.30
390+600	390+650	7.10
390+650	390+700	7.50
390+700	390+750	7.40
390+750	390+800	7.20
390+800	390+850	7.50
390+850	390+900	7.00
390+900	390+950	7.20
391+000	391+050	7.30
391+050	391+100	7.40
391+100	391+150	7.40
391+150	391+200	7.20
391+200	391+250	7.30
391+250	391+300	5.30
391+300	391+350	5.20
391+350	391+400	7.00
391+400	391+450	7.00
391+450	391+500	7.70
391+500	391+550	7.30
391+550	391+600	7.50
391+600	391+650	6.30
391+650	391+700	7.00
391+700	391+750	7.00
391+750	391+800	7.50
391+800	391+850	7.00
391+850	391+900	7.40
391+900	391+950	7.50
392+000	392+050	4.50
392+050	392+100	6.00
392+100	392+150	7.00
392+150	392+200	6.80
392+200	392+250	7.00

Existing Chainage (km)		Width (m)
392+250	392+300	7.20
392+300	392+350	7.50
392+350	392+400	6.40
392+400	392+450	6.50
392+450	392+500	5.00
392+500	392+550	5.00
392+550	392+600	5.00
392+600	392+650	5.50
392+650	392+700	5.00
392+700	392+750	7.00
392+750	392+800	7.20
392+800	392+850	6.30
392+850	392+900	8.00
392+900	392+950	8.00
393+000	393+050	7.00
393+050	393+100	6.50
393+100	393+150	5.60
393+150	393+200	7.00
393+200	393+250	7.00
393+250	393+300	7.00
393+300	393+350	6.00
393+350	393+400	7.20
393+400	393+450	6.00
393+450	393+500	6.00
393+500	393+550	7.00
393+550	393+600	5.00
393+600	393+650	7.00
393+650	393+700	7.20
393+700	393+750	7.00
393+750	393+800	7.30
393+800	393+850	7.50
393+850	393+900	7.00
393+900	393+950	7.00
394+000	394+050	6.00
394+050	394+100	7.00
394+100	394+150	7.20
394+150	394+200	7.00
394+200	394+250	6.90
394+250	394+300	7.80
394+300	394+350	7.60
394+350	394+400	8.80
394+400	394+450	8.80
394+450	394+500	7.20
394+500	394+550	7.10
394+550	394+600	7.20
394+600	394+650	7.30

Existing Chainage (km)		Width (m)
394+650	394+700	7.20
394+700	394+750	7.10
394+750	394+800	7.20
394+800	394+850	7.30
394+850	394+900	7.10
394+900	394+925	7.00
395+000	395+050	7.20
395+050	395+100	7.00
395+100	395+150	7.50
395+150	395+200	7.20
395+200	395+250	7.30
395+250	395+300	7.50
395+300	395+350	7.40
395+350	395+400	7.40
395+400	395+450	7.50
395+450	395+500	7.50
395+500	395+550	7.80
395+550	395+600	7.60
395+600	395+650	6.60
395+650	395+700	7.00
395+700	395+750	6.00
395+750	395+800	7.30
395+800	395+850	7.00
395+850	395+900	7.10
395+900	395+950	6.00
395+950	396+000	6.10
396+000	396+050	7.00
396+050	396+100	7.00
396+100	396+150	7.00
396+150	396+200	7.00
396+200	396+250	6.50
396+250	396+300	7.00
396+300	396+350	7.00
396+350	396+400	7.00
396+400	396+450	7.00
396+450	396+500	7.30
396+500	396+550	7.50
396+550	396+600	7.00
396+600	396+650	7.20
396+650	396+700	7.00
396+700	396+750	7.00
396+750	396+800	7.00
396+800	396+850	7.00
396+850	396+900	7.00
396+900	396+950	7.00
396+950	397+000	7.00

Existing Chainage (km)		Width (m)
397+000	397+050	7.00
397+050	397+100	7.00
397+100	397+150	7.00
397+150	397+200	7.20
397+200	397+250	7.00
397+250	397+300	7.20
397+300	397+350	7.30
397+350	397+400	7.30
397+400	397+450	7.50
397+450	397+500	7.40
397+500	397+550	7.00
397+550	397+600	7.30
397+600	397+650	7.30
397+650	397+700	7.40
397+700	397+750	7.20
397+750	397+800	7.00
397+800	397+850	7.00
397+850	397+900	7.00
397+900	397+950	7.00
397+950	398+000	7.00
398+000	398+050	6.20
398+050	398+100	7.00
398+100	398+150	7.00
398+150	398+200	7.20
398+200	398+250	7.30
398+250	398+300	7.30
398+300	398+350	7.30
398+350	398+400	7.50
398+400	398+450	7.30
398+450	398+500	7.30
398+500	398+550	7.30
398+550	398+600	7.30
398+600	398+650	7.30
398+650	398+700	7.20
398+700	398+750	7.20
398+750	398+800	7.20
398+800	398+850	7.20
398+850	398+900	8.00
398+900	399+000	8.00

4. Major Bridges

The Site includes the following Major Bridges:

S. No.	Existing Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-Structure	Super-Structure		
1	398+815	open	RCC	Steel Truss	1 x 90.0	7.5

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

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

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor Bridges

The Site includes the following minor bridges

S. No.	Existing Chainage (km)	Type of Structure			No. of Spans with span length (c/c of exp gap)	Total Width (m)
		Foundation	Sub-Structure	Super-Structure		
1	369+867	Open	RCC	PSC Girder	1 X 35.0	7.5
2	372+517	Open	RCC	RCC Girder	1 X 25.0	7.5
3	376+023	Open	RCC	PSC Girder	1 X 45.0	7.5
4	380+498	Open	RCC	PSC Girder	1 X 36.0	8.5
5	388+423	Open	RCC	PSC Girder	1 X 45.0	7.5
6	392+622	Open	RCC	PSC Girder	1 X 45.0	7.5

8. Railway level crossings

The Site includes the following level crossing:

S. No.	Existing Chainage (km)	Remarks
NIL		

9. Underpasses (Vehicular, Non Vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

Sl. No.	Structure No.	Type of Culvert	Span / Opening with Span Length (m)
1	368+105	Scooper	1.2
2	368+375	Scooper	0.4
3	368+515	Scooper	1.2
4	368+615	Scooper	1.1
5	368+883	Scooper	1.8
6	369+240	Scooper	0.6
7	369+990	Scooper	2.2
8	370+240	Scooper	1.2
9	370+420	Scooper	1.6
10	370+775	Scooper	2.3
11	370+860	Scooper	1.6
12	370+910	Scooper	1
13	370+995	Scooper	0.8
14	371+410	Slab	3
15	371+480	Scooper	3
16	371+925	Scooper	0.6
17	372+385	Scooper	1.5
18	372+775	Box	0.6
19	372+975	Scooper	1.5
20	373+520	Stone	1.1
21	373+690	Stone	0.9
22	373+825	Scooper	0.4
23	373+925	Scooper	0.4
24	373+975	Scooper	0.4
25	374+500	Scooper	1
26	374+975	Stone	0.6
27	375+160	Scooper	1.7
28	375+900	Scooper	1
29	376+225	Scooper	1.1
30	376+500	Scooper	0.6
31	377+175	Stone	0.9
32	377+850	Stone	0.9
33	378+400	Stone	1.5

Sl. No.	Structure No.	Type of Culvert	Span / Opening with Span Length (m)
34	378+475	Arch	4.6
35	378+950	Arch	1.3
36	380+080	Scooper	0.6
37	380+680	Scooper	0.9
38	380+980	Scooper	0.6
40	382+470	Scooper	0.9
41	382+750	Scooper	1.5
42	383+100	Scooper	1.4
43	383+230	Pipe	1.4
44	383+300	Scooper	1.4
45	384+845	Scooper	1.3
46	384+850	Scooper	4.2
47	385+275	Scooper	1.3
48	385+375	Scooper	0.6
49	385+680	Scooper	1.5
50	385+850	Slab	2.9
51	386+050	Slab	0.6
52	386+560	Slab	2.2
53	386+740	Slab	2.8
54	387+150	Slab	3.2
55	387+370	Slab	2.3
56	388+365	Scooper	0.6
57	389+715	Scooper	1.5
58	389+785	Scooper	1.1
59	390+000	Scooper	0.9
60	390+050	Scooper	0.6
61	390+220	Scooper	0.6
62	390+325	Scooper	0.6
63	390+630	Slab	0.6
64	390+800	Scooper	0.5
65	390+900	Box	0.6
66	391+000	Scooper	1.3
67	391+100	Scooper	0.6
68	391+350	Scooper	3.6
69	391+550	Slab	0.6
70	391+775	Slab	0.6
71	391+900	Slab	0.6
72	392+300	Slab	1.3
73	392+400	Slab	2.5
74	392+550	Scooper	1.7
75	392+800	Slab	1.2
76	393+150	Slab	1.4
77	393+350	Slab	0.9
78	393+500	Slab	1.9
79	393+825	Scooper	1
80	394+050	Slab	0.9
81	394+130	Slab	1
82	394+275	Slab	0.9
83	394+450	Slab	1
84	394+525	Slab	1.5

Sl. No.	Structure No.	Type of Culvert	Span / Opening with Span Length (m)
85	394+600	Slab	2.8
86	394+800	Scooper	1.1
87	395+050	Slab	2.3
88	395+150	Slab	1.3
89	395+250	Slab	1
90	395+450	Slab	1.7
91	395+600	Slab	5.3
92	395+800	Slab	2
93	396+000	Slab	1.8
94	396+450	Slab	1
95	396+600	Slab	1.7
96	396+825	Slab	1.9
97	397+100	Slab	5.5
98	397+110	Scooper	2.4
99	397+200	Slab	1.3
100	397+300	Slab	1
101	397+350	Slab	0.6
102	397+570	Scooper	1.3
103	397+800	Slab	1.1
104	397+910	Slab	2.2
105	398+110	Scooper	0.6
106	398+590	Slab	0.1

11. Bus bays/Bus Shelters

The details of bus shelters 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. Road side 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	Existing Chainage (km)	At Grade	Grade Separated	Category of Cross Road+			
				NH	SH	MDR	Others
1	397+950	At grade		✓			

+ NH= National Highway, SH= State Highway, MDR= Major District Road.

15. Minor junctions

The details of the minor junctions are as follows:

SI. No.	Existing Chainage (km)	Type	
		Junction	Cross Road
1	369+450	Y	Village Road
2	375+200	Y	Village Road
3	383+700	Y	Village Road
4	388+400	Y	Village Road
5	390+050	Y	Village Road
6	390+900	Y	Village Road
7	391+250	Y	Village Road
8	391+600	Y	Village Road
9	398+000	y	Village Road
10	398+500	T	Village Road

16. Bypasses

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

S. No	Name of bypass (Town)	Existing Chainage (Km)		Length (Km)
		From	To	
NIL				

17. Other Structures : Following are the details of existing causeways:

S. No	Existing Chainage (km)	Structure Type	Openings / Spans X Length	Width (m)
NIL				

18. Existing Chainages corresponding to Design Chainage

The relationship between the “Existing Chainage” and the “Design Chainage” as per field surveys is given below in Table-

S No	Existing Chainage(KM)		Design Chainage (km)	
	Start	End	Start	End
1	368+000	369+000	368+000	369+060
2	369+000	370+000	369+060	370+060
3	370+000	371+000	370+060	371+050
4	371+000	372+000	371+050	372+070
5	372+000	373+000	372+070	373+050
6	373+000	374+000	373+050	374+060
7	374+000	375+000	374+060	375+070
8	375+000	376+000	375+070	376+050
9	376+000	377+000	376+050	377+070
10	377+000	378+000	377+070	378+070
11	378+000	379+000	378+070	379+045
12	379+000	380+000	379+045	380+065
13	380+000	381+000	380+065	381+075
14	381+000	382+000	381+075	382+065
15	382+000	383+000	382+065	383+100
16	383+000	384+000	383+100	384+115
17	384+000	385+000	384+115	385+100
18	385+000	386+000	385+100	386+150
19	386+000	387+000	386+150	387+150
20	387+000	388+000	387+150	388+120
21	388+000	389+000	388+120	389+000
22	389+000	390+000	389+000	390+010
23	390+000	391+000	390+010	391+025
24	391+000	392+000	391+025	392+050
25	392+000	393+000	392+050	393+000
26	393+000	394+000	393+000	394+000

S No	Existing Chainage(KM)		Design Chainage (km)	
	Start	End	Start	End
27	394+000	395+000	394+000	395+000
28	395+000	396+000	395+000	395+950
29	396+000	397+000	395+950	396+920
30	397+000	398+000	396+920	397+875
31	398+000	399+000	397+875	398+300

Annex - II

(Schedule-A)

Dates for providing Right of Way

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

S.no	Existing Chainage (km)		Design Chainage (km)		Length (m)	PROW	Date of providing ROW*
	From	To	From	To			
(i)	**Full Right of Way (Full Width)**						
	368+000	369+875	368+000	369+910	1910	18	90% land will be available at the time of appointed date and balance 10% land after 150 (one hundred and fifty) days from Appointed Date.
	369+875	370+650	369+910	370+655	745	15	
	370+650	371+750	370+655	371+535	880	18	
	371+750	372+350	371+535	372+320	785	15	
	372+350	374+000	372+320	373+955	1635	18	
	374+000	374+400	373+955	374+315	360	15	
	374+400	374+900	374+315	374+800	485	18	
	374+900	375+250	374+800	375+150	350	15	
	375+250	380+250	375+150	380+065	4915	18	
	380+250	382+500	380+065	382+310	2245	15	
	382+500	385+250	382+310	385+105	2795	18	
	385+250	385+750	385+105	385+590	485	15	
	385+750	388+475	385+590	388+210	2620	18	
	388+475	392+125	388+210	391+805	3595	12	
	392+125	399+000	391+805	398+300	6495	12	

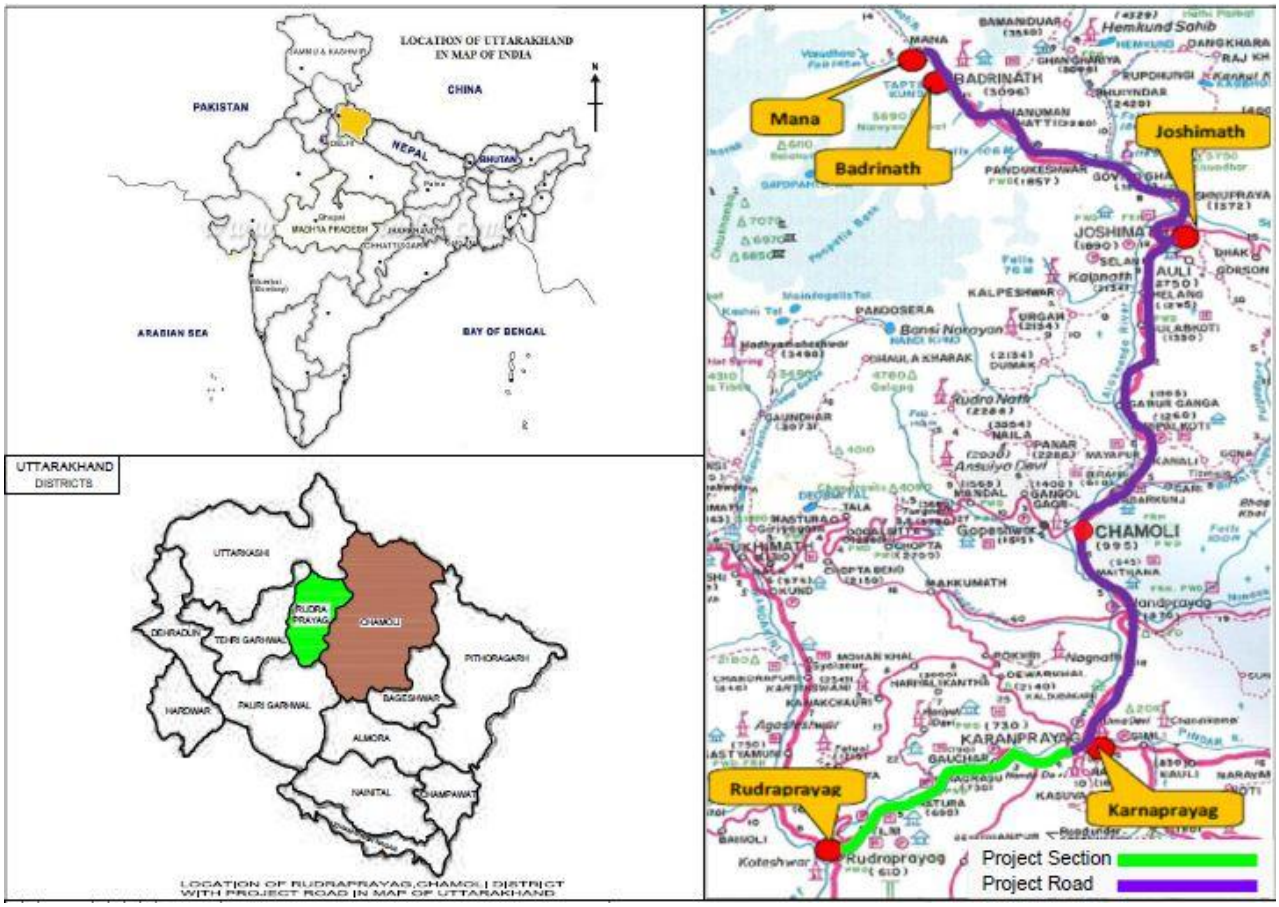
* The dates specified herein shall in no case be beyond 150 (one hundred and fifty) days after the appointed date.

Annex-III

(Schedule-A)

Alignment Plans

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



The alignment plan of the Project Highway is available on E-Portal.

Annex - IV

(Schedule-A)

Environment Clearances

Not Applicable for this section.

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 Upgradation

Rehabilitation and Upgradation shall include Two-Laning with paved shoulder 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 Two-Laning

1. WIDENING OF THE EXISTING HIGHWAY

1.1 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 hilly/steep terrain to the extent land is available.

1.2 WIDTH OF CARRIAGEWAY

Two-Laning [with] paved shoulders shall be undertaken. The paved carriageway shall be [10 (Ten) m] wide in (Type-I to Type-IV-B) and 9 m wide in (Type-V to Type-V-D) accordance with the typical cross sections drawings in the Manual.

Provided that in the built-up areas [The typical cross section approved by ministry for Chardham Project]: the width of the carriageway shall be as specified in the following table:

S.N	Location	Design chainage (km)		Length (m)	Width of Carriageway (m)	Ref. Typical cross section
		From	To			
1	Tilani	370+025	370+650	625	9	TYPE-V,V-A,V-B,V-C,V-D
2	Sumerpur	371+525	372+950	1425	9	TYPE-V,V-A,V-B,V-C,V-D
3	Ratura	373+750	374+750	1000	9	TYPE-V,V-A,V-B,V-C,V-D
4	Shivanandi	378+125	378+300	175	9	TYPE-V,V-A,V-B,V-C,V-D
5	Gholtir	380+075	382+600	2525	9	TYPE-V,V-A,V-B,V-C,V-D
6	Nagrasu	382+600	383+625	1025	9	TYPE-V,V-A,V-B,V-C,V-D
7	Gouchar	387+950	390+950	3000	9	TYPE-V,V-A,V-B,V-C,V-D
8	Karnprayag	397+325	398+275	950	9	TYPE-V,V-A,V-B,V-C,V-D

1.2.2 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.1 above.

2. GEOMETRIC DESIGN AND GENERAL FEATURES

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with section 2 as per IRC: SP: 73-2015 and IRC: SP: 48-1998.

2.2 Design Speed

The design speed 20-40 km as per IRC: SP: 73-2015 and IRC: SP: 48-1998 for Mountainous/Steep terrain shall be adopted.

2.3 Improvement of the existing road geometry

[Refer to paragraph 2.1(vi) of the Manual IRC: SP 73:2015 and provide details]

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided:

Deficient Curves:-

S. No.	Design (km)		Design Radius	Existing Radius (m)	Grade In	Grade Out	Remarks
	From	To					
1	372+447	372+479	20	6	3.6%	0.0%	Bridge Approach, vertical hill, huge cutting involve
2	372+513	372+538	20	15	0.0%	-2.8%	
3	373+925	373+969	20	20	4.0%	4.0%	Hair Pin Bend
4	374+021	374+063	20	15	4.0%	5.4%	
5	380+420	380+460	20	20	0.0%	4.7%	Hair Pin Bend within Habitation
6	381+053	381+115	20	14	4%	4%	Hair Pin Bend
7	381+276	381+319	20	18	4.0%	4.0%	
8	388+383	388+429	20	14	4.0%	4.0%	Hair Pin Bend
9	398+122	398+130	20	20	2.3%	-1.0%	Approach of retained bridge in habitation of Karanparyag
10	398+275	398+282	20	20	-1.0%	5.6%	

2.4 Right of Way

The Site of the Project Highway comprises the land as described in Annexure-II of Schedule-A.

2.5 Type of Shoulders

a) In built up section, footpaths/fully paved shoulders shall be provided in the following stretches:

S. No	Design Chainage (km)		Length (m)	Fully Paved shoulder / Footpath	Reference to Cross Section
	From	To			
1	370+025	370+650	625	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D

S. No	Design Chainage (km)		Length (m)	Fully Paved shoulder / Footpath	Reference to Cross Section
2	371+525	372+950	1425	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D
3	373+750	374+750	1000	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D
4	378+125	378+300	175	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D
5	380+075	382+600	2525	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D
6	382+600	383+625	1025	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D
7	387+950	390+950	3000	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D
8	397+325	398+275	950	Footpath cum drainage	TYPE-V,V-A,V-B,V-C,V-D

(b) In open country, [paved shoulders of 1.5 m width shall be provided and balance 1.0m width shall be covered with 150 mm thick compacted layer of granular / hard material].

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.9.8 and 5.9.9 of the Manual IRC: SP 73:2015.

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/ crash barriers shall be as per paragraph 2.10 of the Manual.

2.6.2 Lateral clearance: The width of the opening at the underpasses shall be as follows:

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

2.7 Lateral and vertical clearances at overpasses

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

2.7.2 Lateral clearance: The width of the opening at the overpasses shall be as follows:

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

2.8 Service roads

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

S. No	Design Chainage (Km)	RHS/LHS	Length of the Service Road (m)
NIL			

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.14 of the Manual. The requisite particulars are given below:

S. No.	Design Chainage (Km)	Length (m)	Number and length of spans	Approach gradient	Remarks, if any
NIL					

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

S. No.	Design Chainage (Km)	Type of structure Length (m)	Cross road at		
			Existing level	Raised Level	Lowered Level
NIL					

2.10 Cattle and pedestrian under pass / over pass

Cattle and pedestrian underpass shall be constructed as follows:

S. No.	Design Chainage (Km)	Type of Crossing
NIL		

2.11 Typical cross-sections of the Project Highway

The typical cross section has been developed as Type-I to Type-V-D (Total 20) as included in Appendix-I, Annex-I of this Schedule-B of this Schedule confirming to the Manual

3. INTERSECTIONS AND GRADE SEPARATORS

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

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

(a) At-grade intersections

S. No.	Location of Intersection	Type of Intersection	Leading to
NIL			

(b) Grade separated intersection with/without ramps

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

4. ROAD EMBANKMENT AND CUT SECTION

4.1 Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the Manual IRC: SP 73:2015 and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

4.2 Raising of the existing road

The existing road shall be raised at the required locations as per proposed plan and profile including the following sections:

S. No	Design Chainage (Km)		Length (Km)	Extent of raising (Top of finished road level)
	From	To		
As per profile attached in Annexure-III of Schedule A				

5. PAVEMENT DESIGN

5.1 Pavement design shall be carried out in accordance with IRC: 37-2012.

5.2 Type of pavement

The project highway is proposed to provide flexible pavement in built-up section. The composition of proposed pavement and their corresponding minimum thickness is given in the table below confirming with IRC: 37-2012 of the manual:

S No	Pavement composition	Min. Thickness (mm)
1	Bituminous Concrete	40
2	Treated RAP/BSM	100
3	CT Sub Base	200
	Total	**340**

5.3 Design Requirements

As per typical cross section attached in Annex-I of this Schedule-B.

5.3.1 Design Period and strategy

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

5.3.2 Design Traffic

The pavement has been designed for design traffic of 20 million standard axles as per IRC: 37-2012.

5.4 Reconstruction of stretches

Reconstruction of stretches for matching the proposed plan & profile shall be taken up as per actual requirements.

Sl. No.	Design Chainage (Km)		Remarks
	From	To	
1	368+000	398+300	Reconstruction and Widening

6. ROADSIDE DRAINAGE

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per IRC: SP: 48-1998.

Sl. No.	Design Chainage (km)		Length (m)	Side	Lined
	Start	End			
1	368+000	370+025	2025	Both Side	U Shaped Drain
2	370+025	370+650	625	One Side	(KC) Kerb and Channel Drain
3	370+650	371+525	875	Both Side	U Shaped Drain
4	371+525	372+950	1425	One Side	(KC) Kerb and Channel Drain
5	372+950	373+750	800	Both Side	U Shaped Drain
6	373+750	374+750	1000	One Side	(KC) Kerb and Channel Drain
7	374+750	378+125	3375	Both Side	U Shaped Drain
8	378+125	378+300	175	One Side	(KC) Kerb and Channel Drain
9	378+300	380+075	1775	Both Side	U Shaped Drain
10	380+075	382+600	2525	One Side	(KC) Kerb and Channel Drain
11	382+600	383+625	1025	One Side	(KC) Kerb and Channel Drain
12	383+625	387+950	4325	Both Side	U Shaped Drain
13	387+950	390+950	3000	One Side	(KC) Kerb and Channel Drain
14	390+950	397+325	6375	Both Side	U Shaped Drain
15	397+325	398+275	950	One Side	(KC) Kerb and Channel Drain
16	398+275	398+300	25	Both Side	U Shaped Drain

7. DESIGN OF STRUCTURES

7.1 General

7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with the standards codes specifications and manual guidelines shall conform to the cross-sectional features and other details specified therein.

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

Sl. No.	Bridge at km	Width of carriageway and cross section features@
As per GAD		

7.1.3 The following structures shall be provided with footpaths:

S. No.	Design Chainage (Km)	Remarks
NIL		

7.1.4 All bridges shall be high-level bridges.
[Refer to paragraph 7.1 (iii) of the Manual IRC: SP: 73-2015 and state if there is any exception]

7.1.5 The following structures shall be designed to carry utility services specified in table below.

S. No.	Design Chainage (Km)	Utility service to be carried	Remarks
1	As per list attached in 7.3.1 and 7.3.2	Water pipeline, OFC Cable, Electric Cable, etc.	This may vary as per site condition and location identified with Authority engineer during execution.

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

7.2 Culverts

7.2.1 The Culverts overall width shall be equal to the roadway width of the approaches.

7.2.2 ***Reconstruction of existing culverts***:

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

S. No.	Design Chainage (km)	Culvert No.(As per Inventory)	Proposal	Span Arrangement (m)	Proposed type of Culvert
1	368+100	369/1	Reconstruction	4	Box
2	368+500	369/3	Reconstruction	6	Box
3	368+600	369/4	Reconstruction	4	Box
4	368+855	369/5	Reconstruction	6	Box
5	369+290	370/1	Reconstruction	4	Box
6	370+015	370/2	Reconstruction	4	Box
7	370+270	371/1	Reconstruction	4	Box
8	370+440	371/2	Reconstruction	4	Box
9	370+785	371/3	Reconstruction	4	Box
10	370+860	371/4	Reconstruction	4	Box
11	370+910	371/5	Reconstruction	4	Box
12	370+995	371/6	Reconstruction	4	Box
13	371+390	372/1	Reconstruction	4	Box
14	371+440	372/2	Reconstruction	4	Box
15	371+910	372/3	Reconstruction	4	Box
16	372+350	373/1	Reconstruction	4	Box
17	372+730	373/2	Reconstruction	4	Box
18	372+920	373/3	Reconstruction	4	Box
19	373+470	374/1	Reconstruction	4	Box
20	373+650	374/2	Reconstruction	4	Box
21	373+780	374/3	Reconstruction	2	Box
22	373+880	374/4	Reconstruction	2	Box
23	373+940	374/5	Reconstruction	4	Box
24	374+415	375/1	Reconstruction	6	Box
25	374+880	375/2	Reconstruction	4	Box
26	375+065	376/1	Reconstruction	4	Box
27	375+805	376/2	Reconstruction	2	Box
28	376+065	377/1	Reconstruction	2	Box
29	376+325	377/2	Reconstruction	4	Box
30	377+065	378/1	Reconstruction	2	Box
31	377+730	378/2	Reconstruction	2	Box
32	378+230	379/1	Reconstruction	2	Box
33	378+795	379/3	Reconstruction	6	Box
34	379+840	381/1	Reconstruction	6	Box
35	380+425	381/2	Reconstruction	4	Box
36	380+815	381/3	Reconstruction	4	Box
37	382+275	383/1	Reconstruction	4	Box
38	382+570	383/2	Reconstruction	6	Box
39	382+960	384/1	Reconstruction	6	Box
40	383+075	384/2	Reconstruction	4	Box
41	383+160	384/3	Reconstruction	4	Box
42	385+145	386/1	Reconstruction	2	Box
43	385+220	386/2	Reconstruction	4	Box
44	385+520	386/3	Reconstruction	6	Box

S. No.	Design Chainage (km)	Culvert No.(As per Inventory)	Proposal	Span Arrangement (m)	Proposed type of Culvert
45	385+670	386/4	Reconstruction	4	Box
46	385+840	387/1	Reconstruction	4	Box
47	386+355	387/2	Reconstruction	2	Box
48	386+545	387/3	Reconstruction	2	Box
49	386+865	388/1	Reconstruction	6	Box
50	387+085	388/2	Reconstruction	4	Box
51	388+085	389/1	Reconstruction	4	Box
52	389+290	390/1	Reconstruction	4	Box
53	389+360	390/2	Reconstruction	2	Box
54	389+570	390/3	Reconstruction	2	Box
55	389+660	391/1	Reconstruction	2	Box
56	389+840	391/2	Reconstruction	2	Box
57	389+960	391/3	Reconstruction	2	Box
58	390+245	391/4	Reconstruction	2	Box
59	390+435	391/5	Reconstruction	2	Box
60	390+535	391/6	Reconstruction	2	Box
61	390+640	391/7	Reconstruction	2	Box
62	390+720	392/1	Reconstruction	2	Box
63	391+000	392/2	Reconstruction	4	Box
64	391+200	392/3	Reconstruction	4	Box
65	391+410	392/4	Reconstruction	4	Box
66	391+535	392/5	Reconstruction	4	Box
67	391+920	393/1	Reconstruction	4	Box
68	392+045	393/2	Reconstruction	4	Box
69	392+175	393/3	Reconstruction	4	Box
70	392+395	393/4	Reconstruction	4	Box
71	392+710	394/1	Reconstruction	4	Box
72	392+910	394/2	Reconstruction	4	Box
73	393+065	394/3	Reconstruction	4	Box
74	393+360	394/4	Reconstruction	4	Box
75	393+485	394/5	Reconstruction	4	Box
76	393+575	394/6	Reconstruction	4	Box
77	393+710	395/1	Reconstruction	4	Box
78	393+895	395/2	Reconstruction	4	Box
79	393+965	395/3	Reconstruction	4	Box
80	394+040	395/4	Reconstruction	4	Box
81	394+230	395/5	Reconstruction	4	Box
82	394+480	395/6	Reconstruction	4	Box
83	394+725	396/1	Reconstruction	4	Box
84	394+800	396/2	Reconstruction	4	Box
85	395+005	396/3	Reconstruction	4	Box
86	395+140	396/4	Reconstruction	4	Box
87	395+255	396/5	Reconstruction	6	Box
88	395+465	396/6	Reconstruction	4	Box
89	395+890	397/1	Reconstruction	4	Box
90	396+040	397/2	Reconstruction	4	Box
91	396+265	397/3	Reconstruction	4	Box
92	396+595	398/3	Reconstruction	4	Box
93	396+685	398/4	Reconstruction	4	Box

S. No.	Design Chainage (km)	Culvert No.(As per Inventory)	Proposal	Span Arrangement (m)	Proposed type of Culvert
94	396+735	398/5	Reconstruction	4	Box
95	396+965	398/6	Reconstruction	4	Box
96	397+190	398/7	Reconstruction	4	Box
97	397+290	398/8	Reconstruction	4	Box
98	397+490	399/1	Reconstruction	4	Box
99	397+975	399/2	Reconstruction	4	Box

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

7.2.3 ***Widening of Existing Culverts***

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in section 7 of the Manual. Repairs and strengthening of existing structures where required shall be carried out.

Sl. No.	Location of Culvert	Type, span, height and width of existing culvert (m)	Repairs to be carried out [specify]
Nil			

7.2.4 Additional new culverts shall be constructed as per particulars given in the table below:

S. No.	Design Chainage (km)	Span Arrangement (m)	Width (m)	Proposed type of Culvert
1	369+100	2	12	Box
2	370+700	6	12	Box
3	371+200	2	12	Box
4	371+550	2	12	Box
5	372+075	4	12	Box
6	372+650	2	12	Box
7	372+810	6	12	Box
8	373+000	2	12	Box
9	373+245	6	12	Box
10	374+010	2	12	Box
11	374+085	2	12	Box
12	375+175	2	12	Box
13	375+425	4	12	Box
14	375+675	4	12	Box
15	376+505	4	12	Box
16	376+650	2	12	Box

S. No.	Design Chainage (km)	Span Arrangement (m)	Width (m)	Proposed type of Culvert
17	376+900	2	12	Box
18	377+450	2	12	Box
19	377+590	2	12	Box
20	377+900	2	12	Box
21	378+065	6	12	Box
22	378+615	6	12	Box
23	378+975	2	12	Box
24	379+185	6	12	Box
25	379+465	6	12	Box
26	379+650	2	12	Box
27	380+965	4	12	Box
28	381+200	4	12	Box
29	381+385	4	12	Box
30	382+500	6	12	Box
31	383+675	2	12	Box
32	383+925	2	12	Box
33	384+175	4	12	Box
34	384+350	2	12	Box
35	384+515	6	12	Box
36	385+000	4	12	Box
37	386+095	4	12	Box
38	386+450	2	12	Box
39	387+340	2	12	Box
40	387+595	2	12	Box
41	387+850	2	12	Box
42	388+270	4	12	Box
43	388+350	4	12	Box
44	388+460	4	12	Box
45	388+550	4	12	Box
46	388+990	4	12	Box
47	391+725	2	12	Box
48	392+535	2	12	Box
49	393+235	4	12	Box
50	395+420	4	12	Box
51	395+665	4	12	Box

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

S. No.	Design Chainage (Km)	Type of repair required
NIL		

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

7.3 Bridges

7.3.1 Existing bridges to be re-constructed/widened:

(i) The Existing bridges at the following locations shall be reconstructed:

Sl. No.	Bridge Location (km)	Span	Remarks
NIL			

(ii) The following narrow bridges shall be widened:

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

@ Attach cross-section

7.3.2 *Additional new bridges*

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

S. No.	Design Chainage (km)	Proposed span	Type of Bridge
1	368+385	1 x 30	PSC
2	378+320	1 X 10	Solid Slab
3	384+720	1 x 50	Steel composite
4	385+310	1 x 10	Solid Slab
5	385+595	1 x 20	RCC T
6	386+310	1 x 20	RCC T
7	396+440	1 x 10	Solid Slab

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

S. No.	Design Chainage (Km)	Total length (m)	Remarks
NIL			

7.3.4 Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows

S. No.	Design Chainage (Km)	Existing span arrangement (m)	Remarks
NIL			

7.3.5 Drainage system for bridge deck

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

7.3.6 Structures in marine environment

The Project Alignment does not lie in Marine Alignment.

7.4 Rail-road bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified as per standard specifications and manuals.

7.4.2 **Road over-bridges**

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

7.4.3 **Road under-bridges**

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

S. No	Design Chainage (Km)	Number and length of span (m)
NIL		

7.5 Grade separated structures

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2.9 and 3 of this Annex-I.

7.6 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

S. No.	Design Chainage (Km)	Nature and extent of repairs /strengthening to be carried out
Nil		

B. ROB / RUB

S. No.	Design Chainage (Km)	Nature and extent of repairs /strengthening to be carried out
NIL		

C. Overpasses/Underpasses and other structures

S. No.	Design Chainage (Km)	Nature and extent of repairs /strengthening to be carried out
NIL		

7.7 List of Major Bridges and Structures

The following is the list of the Major Bridges and Structures:

S. No.	Type of Structure	Design Chainage (Km)	Remark
NIL			

7.8 W-Metal Beam Crash Barrier

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
1	368+000	368+025	TYPE-II-B	25
2	368+025	368+050	TYPE-II-B	25
3	368+050	368+075	TYPE-II	25
4	368+075	368+100	TYPE-IV	14
5	368+100	368+125	TYPE-IV	25
6	368+125	368+150	TYPE-II	25
7	368+150	368+175	TYPE-II	25
8	368+175	368+200	TYPE-II	25
9	368+200	368+225	TYPE-II	25
10	368+225	368+250	TYPE-II	25
11	368+250	368+275	TYPE-II	25
12	368+275	368+300	TYPE-II	25
13	368+300	368+325	TYPE-II	25
14	368+325	368+350	TYPE-II	25
15	368+375	368+400	TYPE-IV-A	0
16	368+400	368+425	TYPE-IV	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
17	368+425	368+450	TYPE-II	25
18	368+450	368+475	TYPE-II	25
19	368+475	368+500	TYPE-II	12
20	368+500	368+525	TYPE-II	25
21	368+525	368+550	TYPE-II	25
22	368+550	368+575	TYPE-II-B	25
23	368+575	368+600	TYPE-II	14
24	368+600	368+625	TYPE-II	25
25	368+625	368+650	TYPE-II	25
26	368+650	368+675	TYPE-II	25
27	368+675	368+700	TYPE-II	25
28	368+700	368+725	TYPE-II	25
29	368+725	368+750	TYPE-II	25
30	368+750	368+775	TYPE-II-B	25
31	368+775	368+800	TYPE-II-B	25
32	368+800	368+825	TYPE-II	25
33	368+825	368+850	TYPE-I	25
34	368+850	368+875	TYPE-I	12
35	368+875	368+900	TYPE-I-A	25
36	368+900	368+925	TYPE-I-A	25
37	368+925	368+950	TYPE-I-A	25
38	368+950	368+975	TYPE-I-A	25
39	368+975	369+000	TYPE-I	25
40	369+000	369+025	TYPE-I	25
41	369+025	369+050	TYPE-I	25
42	369+050	369+075	TYPE-I-A	25
43	369+075	369+100	TYPE-I-A	16
44	369+100	369+125	TYPE-I	25
45	369+125	369+150	TYPE-I	25
46	369+150	369+175	TYPE-I	25
47	369+175	369+200	TYPE-I	25
48	369+200	369+225	TYPE-I	25
49	369+225	369+250	TYPE-I	25
50	369+250	369+275	TYPE-I	25
51	369+275	369+300	TYPE-I	14
52	369+300	369+325	TYPE-II	25
53	369+325	369+350	TYPE-II	25
54	369+350	369+375	TYPE-II	25
55	369+375	369+400	TYPE-II	25
56	369+400	369+425	TYPE-II	25
57	369+425	369+450	TYPE-II	25
58	369+450	369+475	TYPE-II-A	25
59	369+475	369+500	TYPE-II	25
60	369+500	369+525	TYPE-II	25
61	369+525	369+550	TYPE-II-B	25
62	369+550	369+575	TYPE-II-B	25
63	369+575	369+600	TYPE-II	25
64	369+600	369+625	TYPE-II	25
65	369+625	369+650	TYPE-II	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
66	369+650	369+675	TYPE-II	25
67	369+675	369+700	TYPE-II	25
68	369+700	369+725	TYPE-II	25
69	369+725	369+750	TYPE-II	25
70	369+750	369+775	TYPE-I	25
71	369+775	369+800	TYPE-I	25
72	369+800	369+825	TYPE-I	25
73	369+825	369+850	TYPE-I	25
74	369+850	369+875	TYPE-I	25
75	369+900	369+925	TYPE-I	0
76	369+925	369+950	TYPE-III	25
77	369+950	369+975	TYPE-III	25
78	369+975	370+000	TYPE-III	25
79	370+000	370+025	TYPE-III	14
80	370+650	370+675	TYPE-I	25
81	370+675	370+700	TYPE-III-B	12
82	370+700	370+725	TYPE-III-B	25
83	370+725	370+750	TYPE-III	25
84	370+750	370+775	TYPE-I	25
85	370+775	370+800	TYPE-I	14
86	370+800	370+825	TYPE-I	25
87	370+825	370+850	TYPE-I	25
88	370+850	370+875	TYPE-I	14
89	370+875	370+900	TYPE-I	25
90	370+900	370+925	TYPE-I	14
91	370+925	370+950	TYPE-I	25
92	370+950	370+975	TYPE-I	25
93	370+975	371+000	TYPE-I	14
94	371+000	371+025	TYPE-I	25
95	371+025	371+050	TYPE-I	25
96	371+050	371+075	TYPE-I	25
97	371+075	371+100	TYPE-I	25
98	371+100	371+125	TYPE-I	25
99	371+125	371+150	TYPE-I	25
100	371+150	371+175	TYPE-II	25
101	371+175	371+200	TYPE-I	16
102	371+200	371+225	TYPE-I	25
103	371+225	371+250	TYPE-I	25
104	371+250	371+275	TYPE-I	25
105	371+275	371+300	TYPE-I	25
106	371+300	371+325	TYPE-I	25
107	371+325	371+350	TYPE-I	25
108	371+350	371+375	TYPE-I	25
109	371+375	371+400	TYPE-I-A	14
110	371+400	371+425	TYPE-I-A	25
111	371+425	371+450	TYPE-I-A	14
112	371+450	371+475	TYPE-I	25
113	371+475	371+500	TYPE-I	25
114	371+500	371+525	TYPE-I	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
115	372+950	372+975	TYPE-I-A	25
116	372+975	373+000	TYPE-I-A	16
117	373+000	373+025	TYPE-I-A	25
118	373+025	373+050	TYPE-I-A	25
119	373+050	373+075	TYPE-I-A	25
120	373+075	373+100	TYPE-II	25
121	373+100	373+125	TYPE-II	25
122	373+125	373+150	TYPE-II	25
123	373+150	373+175	TYPE-II	25
124	373+175	373+200	TYPE-II	25
125	373+200	373+225	TYPE-II-B	25
126	373+225	373+250	TYPE-II-B	12
127	373+250	373+275	TYPE-II-B	25
128	373+275	373+300	TYPE-II	25
129	373+300	373+325	TYPE-II	25
130	373+325	373+350	TYPE-II	25
131	373+350	373+375	TYPE-II	25
132	373+375	373+400	TYPE-II	25
133	373+400	373+425	TYPE-II	25
134	373+425	373+450	TYPE-II	25
135	373+450	373+475	TYPE-II-B	14
136	373+475	373+500	TYPE-II-B	25
137	373+500	373+525	TYPE-II	25
138	373+525	373+550	TYPE-II	25
139	373+550	373+575	TYPE-II	25
140	373+575	373+600	TYPE-II	25
141	373+600	373+625	TYPE-II	25
142	373+625	373+650	TYPE-II	14
143	373+650	373+675	TYPE-II-B	25
144	373+675	373+700	TYPE-II-B	25
145	373+700	373+725	TYPE-II-A	25
146	373+725	373+750	TYPE-II-A	25
147	374+250	374+275	TYPE-I	25
148	374+275	374+300	TYPE-I	25
149	374+300	374+325	TYPE-I	25
150	374+325	374+350	TYPE-I	25
151	374+350	374+375	TYPE-I	25
152	374+375	374+400	TYPE-I	25
153	374+400	374+425	TYPE-I	12
154	374+425	374+450	TYPE-I	25
155	374+450	374+475	TYPE-I	25
156	374+475	374+500	TYPE-I	25
157	374+500	374+525	TYPE-I	25
158	374+525	374+550	TYPE-I	25
159	374+550	374+575	TYPE-I	25
160	374+575	374+600	TYPE-I	25
161	374+600	374+625	TYPE-I	25
162	374+750	374+775	TYPE-I	25
163	374+775	374+800	TYPE-I	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
164	374+800	374+825	TYPE-I	25
165	374+825	374+850	TYPE-I	25
166	374+850	374+875	TYPE-I	25
167	374+875	374+900	TYPE-I	14
168	374+900	374+925	TYPE-I	25
169	374+925	374+950	TYPE-I	25
170	374+950	374+975	TYPE-I	25
171	374+975	375+000	TYPE-I	25
172	375+000	375+025	TYPE-I	25
173	375+025	375+050	TYPE-I	25
174	375+050	375+075	TYPE-I	14
175	375+075	375+100	TYPE-II	25
176	375+100	375+125	TYPE-II	25
177	375+125	375+150	TYPE-II-B	25
178	375+150	375+175	TYPE-II-B	16
179	375+175	375+200	TYPE-II-B	25
180	375+200	375+225	TYPE-II	25
181	375+225	375+250	TYPE-II	25
182	375+250	375+275	TYPE-II	25
183	375+275	375+300	TYPE-II	25
184	375+300	375+325	TYPE-II	25
185	375+325	375+350	TYPE-II	25
186	375+350	375+375	TYPE-II	25
187	375+375	375+400	TYPE-II	25
188	375+400	375+425	TYPE-II	14
189	375+425	375+450	TYPE-II	25
190	375+450	375+475	TYPE-II	25
191	375+475	375+500	TYPE-II-B	25
192	375+500	375+525	TYPE-II-B	25
193	375+525	375+550	TYPE-II	25
194	375+550	375+575	TYPE-II-B	25
195	375+575	375+600	TYPE-II-B	25
196	375+600	375+625	TYPE-II	25
197	375+625	375+650	TYPE-II	25
198	375+650	375+675	TYPE-II	14
199	375+675	375+700	TYPE-II	25
200	375+700	375+725	TYPE-II	25
201	375+725	375+750	TYPE-II	25
202	375+750	375+775	TYPE-II	25
203	375+775	375+800	TYPE-II-B	25
204	375+800	375+825	TYPE-IV	16
205	375+825	375+850	TYPE-IV	25
206	375+850	375+875	TYPE-II	25
207	375+900	375+925	TYPE-I	0
208	375+925	375+950	TYPE-III	0
209	375+950	375+975	TYPE-III	25
210	375+975	376+000	TYPE-III	25
211	376+000	376+025	TYPE-III	25
212	376+025	376+050	TYPE-I	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
213	376+050	376+075	TYPE-I	14
214	376+075	376+100	TYPE-I	25
215	376+100	376+125	TYPE-I	25
216	376+125	376+150	TYPE-I	25
217	376+150	376+175	TYPE-I	25
218	376+175	376+200	TYPE-I	25
219	376+200	376+225	TYPE-I	25
220	376+225	376+250	TYPE-III	25
221	376+250	376+275	TYPE-III	25
222	376+275	376+300	TYPE-I	25
223	376+300	376+325	TYPE-I	14
224	376+325	376+350	TYPE-I	25
225	376+350	376+375	TYPE-I	25
226	376+375	376+400	TYPE-I	25
227	376+400	376+425	TYPE-II-B	25
228	376+425	376+450	TYPE-II-B	25
229	376+450	376+475	TYPE-II	25
230	376+475	376+500	TYPE-II	25
231	376+500	376+525	TYPE-I	14
232	376+525	376+550	TYPE-I-A	25
233	376+550	376+575	TYPE-I-A	25
234	376+575	376+600	TYPE-I-A	25
235	376+600	376+625	TYPE-I-A	25
236	376+625	376+650	TYPE-I-A	16
237	376+650	376+675	TYPE-III-A	25
238	376+675	376+700	TYPE-III-A	25
239	376+700	376+725	TYPE-III-A	25
240	376+725	376+750	TYPE-I-A	25
241	376+750	376+775	TYPE-I	25
242	376+775	376+800	TYPE-I	25
243	376+800	376+825	TYPE-I	25
244	376+825	376+850	TYPE-I	25
245	376+850	376+875	TYPE-II	25
246	376+875	376+900	TYPE-II	16
247	376+900	376+925	TYPE-I	25
248	376+925	376+950	TYPE-I	25
249	376+950	376+975	TYPE-I	16
250	376+975	377+000	TYPE-I	25
251	377+000	377+025	TYPE-I	25
252	377+025	377+050	TYPE-I	25
253	377+050	377+075	TYPE-I	25
254	377+075	377+100	TYPE-I	25
255	377+100	377+125	TYPE-I	25
256	377+125	377+150	TYPE-I	25
257	377+150	377+175	TYPE-I	25
258	377+175	377+200	TYPE-III-B	25
259	377+200	377+225	TYPE-III-B	25
260	377+225	377+250	TYPE-III	25
261	377+250	377+275	TYPE-III	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
262	377+275	377+300	TYPE-III	25
263	377+300	377+325	TYPE-III	25
264	377+325	377+350	TYPE-I	25
265	377+350	377+375	TYPE-I	25
266	377+375	377+400	TYPE-I	25
267	377+400	377+425	TYPE-I	25
268	377+425	377+450	TYPE-I	16
269	377+450	377+475	TYPE-I	25
270	377+475	377+500	TYPE-I	25
271	377+500	377+525	TYPE-I	25
272	377+525	377+550	TYPE-I	25
273	377+550	377+575	TYPE-I	25
274	377+575	377+600	TYPE-I	16
275	377+600	377+625	TYPE-I	25
276	377+625	377+650	TYPE-I	25
277	377+650	377+675	TYPE-I	25
278	377+675	377+700	TYPE-I	25
279	377+700	377+725	TYPE-I	25
280	377+725	377+750	TYPE-II	12
281	377+750	377+775	TYPE-II	25
282	377+775	377+800	TYPE-IV	25
283	377+800	377+825	TYPE-IV	25
284	377+825	377+850	TYPE-II	25
285	377+850	377+875	TYPE-II	25
286	377+875	377+900	TYPE-II	16
287	377+900	377+925	TYPE-II	25
288	377+925	377+950	TYPE-II	25
289	377+950	377+975	TYPE-II	25
290	377+975	378+000	TYPE-II	25
291	378+000	378+025	TYPE-II	25
292	378+025	378+050	TYPE-II	25
293	378+050	378+075	TYPE-II	12
294	378+075	378+100	TYPE-II	25
295	378+100	378+125	TYPE-II	25
296	378+325	378+350	TYPE-I	25
297	378+350	378+375	TYPE-I	25
298	378+375	378+400	TYPE-I	25
299	378+400	378+425	TYPE-I	25
300	378+425	378+450	TYPE-I	25
301	378+450	378+475	TYPE-I	25
302	378+475	378+500	TYPE-I	25
303	378+500	378+525	TYPE-I	25
304	378+525	378+550	TYPE-I	25
305	378+550	378+575	TYPE-III	25
306	378+575	378+600	TYPE-III	25
307	378+600	378+625	TYPE-III	12
308	378+625	378+650	TYPE-I	25
309	378+650	378+675	TYPE-I	25
310	378+675	378+700	TYPE-I	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
311	378+700	378+725	TYPE-I	25
312	378+725	378+750	TYPE-I	25
313	378+750	378+775	TYPE-III	25
314	378+775	378+800	TYPE-III	12
315	378+800	378+825	TYPE-I	25
316	378+825	378+850	TYPE-I	25
317	378+850	378+875	TYPE-I	25
318	378+875	378+900	TYPE-I	25
319	383+625	383+650	TYPE-I-A	25
320	383+650	383+675	TYPE-II	16
321	383+675	383+700	TYPE-II	25
322	383+700	383+725	TYPE-II	25
323	383+725	383+750	TYPE-II-A	25
324	383+750	383+775	TYPE-II-A	25
325	383+775	383+800	TYPE-II-A	25
326	383+800	383+825	TYPE-II-B	25
327	383+825	383+850	TYPE-II-B	25
328	383+850	383+875	TYPE-II	25
329	383+875	383+900	TYPE-II	25
330	383+900	383+925	TYPE-II	16
331	383+925	383+950	TYPE-II	25
332	383+950	383+975	TYPE-II	25
333	383+975	384+000	TYPE-II	25
334	384+000	384+025	TYPE-II	25
335	384+025	384+050	TYPE-II	25
336	384+050	384+075	TYPE-II	25
337	384+075	384+100	TYPE-II	25
338	384+100	384+125	TYPE-II-B	25
339	384+125	384+150	TYPE-II	25
340	384+150	384+175	TYPE-II	14
341	384+175	384+200	TYPE-II-B	25
342	384+200	384+225	TYPE-II-B	25
343	384+225	384+250	TYPE-II-B	25
344	384+250	384+275	TYPE-II-B	25
345	384+275	384+300	TYPE-II	25
346	384+300	384+325	TYPE-II	25
347	384+325	384+350	TYPE-II	16
348	384+350	384+375	TYPE-II	25
349	384+375	384+400	TYPE-II	25
350	384+400	384+425	TYPE-II	25
351	384+425	384+450	TYPE-II	25
352	384+450	384+475	TYPE-II	25
353	384+475	384+500	TYPE-II-B	25
354	384+500	384+525	TYPE-II-B	12
355	384+525	384+550	TYPE-II-B	25
356	384+550	384+575	TYPE-II	25
357	384+575	384+600	TYPE-II-B	25
358	384+600	384+625	TYPE-II-B	25
359	384+625	384+650	TYPE-II-B	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
360	384+650	384+675	TYPE-II	25
361	384+700	384+725	TYPE-IV	0
362	384+725	384+750	TYPE-I	0
363	384+750	384+775	TYPE-I	25
364	384+775	384+800	TYPE-I	25
365	384+800	384+825	TYPE-I-A	25
366	384+825	384+850	TYPE-I-A	25
367	384+850	384+875	TYPE-I-A	25
368	384+875	384+900	TYPE-I	25
369	384+900	384+925	TYPE-I	25
370	384+925	384+950	TYPE-I	25
371	384+950	384+975	TYPE-I	25
372	384+975	385+000	TYPE-I	14
373	385+000	385+025	TYPE-I	25
374	385+025	385+050	TYPE-I	25
375	385+050	385+075	TYPE-I	25
376	385+075	385+100	TYPE-I	25
377	385+100	385+125	TYPE-I	25
378	385+125	385+150	TYPE-I	14
379	385+150	385+175	TYPE-III	25
380	385+175	385+200	TYPE-III-C	25
381	385+200	385+225	TYPE-III-C	12
382	385+225	385+250	TYPE-I	25
383	385+250	385+275	TYPE-III	25
384	385+275	385+300	TYPE-III-C	25
385	385+325	385+350	TYPE-I	25
386	385+350	385+375	TYPE-I	25
387	385+375	385+400	TYPE-I	25
388	385+400	385+425	TYPE-I	25
389	385+425	385+450	TYPE-I	25
390	385+450	385+475	TYPE-I	25
391	385+475	385+500	TYPE-I	25
392	385+500	385+525	TYPE-I-A	12
393	385+525	385+550	TYPE-III-A	25
394	385+550	385+575	TYPE-III-A	25
395	385+600	385+625	TYPE-I	0
396	385+625	385+650	TYPE-I-C	25
397	385+700	385+725	TYPE-I-A	25
398	385+725	385+750	TYPE-I-A	25
399	385+750	385+775	TYPE-I-A	25
400	385+775	385+800	TYPE-I-A	25
401	385+800	385+825	TYPE-I	25
402	385+825	385+850	TYPE-I	14
403	385+850	385+875	TYPE-I	25
404	385+875	385+900	TYPE-I	25
405	385+900	385+925	TYPE-I	25
406	385+925	385+950	TYPE-I	25
407	385+950	385+975	TYPE-I-B	25
408	385+975	386+000	TYPE-I-B	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
409	386+000	386+025	TYPE-I-B	25
410	386+050	386+075	TYPE-I-A	25
411	386+075	386+100	TYPE-I-A	14
412	386+100	386+125	TYPE-I-A	25
413	386+125	386+150	TYPE-I-A	25
414	386+150	386+175	TYPE-I-A	25
415	386+175	386+200	TYPE-I-A	25
416	386+200	386+225	TYPE-I-A	25
417	386+225	386+250	TYPE-I	25
418	386+250	386+275	TYPE-I	25
419	386+275	386+300	TYPE-I	25
420	386+325	386+350	TYPE-I	0
421	386+350	386+375	TYPE-I	14
422	386+375	386+400	TYPE-I	25
423	386+400	386+425	TYPE-I	25
424	386+425	386+450	TYPE-I	16
425	386+450	386+475	TYPE-I-B	25
426	386+475	386+500	TYPE-I-A	25
427	386+500	386+525	TYPE-I-A	25
428	386+525	386+550	TYPE-I	12
429	386+550	386+575	TYPE-I	25
430	386+575	386+600	TYPE-I-A	25
431	386+600	386+625	TYPE-I-A	25
432	386+625	386+650	TYPE-I-A	25
433	386+650	386+675	TYPE-II	25
434	386+675	386+700	TYPE-II	25
435	386+700	386+725	TYPE-II	25
436	386+725	386+750	TYPE-II	25
437	386+750	386+775	TYPE-II	25
438	386+775	386+800	TYPE-II	25
439	386+800	386+825	TYPE-II	25
440	386+825	386+850	TYPE-II	25
441	386+850	386+875	TYPE-II	14
442	386+875	386+900	TYPE-II	25
443	386+900	386+925	TYPE-II	25
444	386+925	386+950	TYPE-II	25
445	386+950	386+975	TYPE-II	25
446	386+975	387+000	TYPE-II	25
447	387+000	387+025	TYPE-II	25
448	387+025	387+050	TYPE-II	25
449	387+050	387+075	TYPE-II	25
450	387+075	387+100	TYPE-II	14
451	387+100	387+125	TYPE-II	25
452	387+125	387+150	TYPE-II	25
453	387+150	387+175	TYPE-II	25
454	387+175	387+200	TYPE-II	25
455	387+200	387+225	TYPE-II	25
456	387+225	387+250	TYPE-II	25
457	387+250	387+275	TYPE-II	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
458	387+275	387+300	TYPE-II	25
459	387+300	387+325	TYPE-II	25
460	387+325	387+350	TYPE-II	16
461	387+350	387+375	TYPE-I	25
462	387+375	387+400	TYPE-I	25
463	387+400	387+425	TYPE-I	25
464	387+425	387+450	TYPE-I	25
465	387+450	387+475	TYPE-I	25
466	387+475	387+500	TYPE-I	16
467	387+500	387+525	TYPE-I	25
468	387+525	387+550	TYPE-I	25
469	387+550	387+575	TYPE-I	25
470	387+575	387+600	TYPE-I	25
471	387+600	387+625	TYPE-I	25
472	387+625	387+650	TYPE-I	25
473	387+650	387+675	TYPE-I	25
474	387+675	387+700	TYPE-I	25
475	387+700	387+725	TYPE-I-A	25
476	387+725	387+750	TYPE-I-A	25
477	387+750	387+775	TYPE-I-A	25
478	387+775	387+800	TYPE-I-A	25
479	387+800	387+825	TYPE-I-A	25
480	387+825	387+850	TYPE-I-A	16
481	387+850	387+875	TYPE-I-A	25
482	387+875	387+900	TYPE-I	25
483	387+900	387+925	TYPE-I	25
484	387+925	387+950	TYPE-I	25
485	390+625	390+650	TYPE-I	16
486	390+650	390+675	TYPE-III	25
487	390+675	390+700	TYPE-III-B	25
488	390+950	390+975	TYPE-II-B	25
489	390+975	391+000	TYPE-II	14
490	391+000	391+025	TYPE-II	25
491	391+025	391+050	TYPE-II	25
492	391+050	391+075	TYPE-II	25
493	391+075	391+100	TYPE-II	25
494	391+100	391+125	TYPE-II	25
495	391+125	391+150	TYPE-II	25
496	391+150	391+175	TYPE-II	25
497	391+175	391+200	TYPE-II-A	14
498	391+200	391+225	TYPE-II	25
499	391+225	391+250	TYPE-II	25
500	391+250	391+275	TYPE-II	25
501	391+275	391+300	TYPE-I-A	25
502	391+300	391+325	TYPE-I-A	25
503	391+325	391+350	TYPE-I-A	25
504	391+350	391+375	TYPE-I-A	25
505	391+375	391+400	TYPE-I-B	25
506	391+400	391+425	TYPE-III-B	14

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
507	391+425	391+450	TYPE-III-A	25
508	391+450	391+475	TYPE-III-A	25
509	391+475	391+500	TYPE-III-A	25
510	391+500	391+525	TYPE-I	25
511	391+525	391+550	TYPE-I-A	14
512	391+550	391+575	TYPE-I-A	25
513	391+575	391+600	TYPE-I-A	25
514	391+600	391+625	TYPE-I-A	25
515	391+625	391+650	TYPE-I-B	25
516	391+650	391+675	TYPE-I-B	25
517	391+675	391+700	TYPE-I	25
518	391+700	391+725	TYPE-I	16
519	391+725	391+750	TYPE-III	25
520	391+750	391+775	TYPE-III	25
521	391+775	391+800	TYPE-III	25
522	391+800	391+825	TYPE-III-A	25
523	391+825	391+850	TYPE-I-A	25
524	391+850	391+875	TYPE-I	25
525	391+875	391+900	TYPE-I	25
526	391+900	391+925	TYPE-II	14
527	391+925	391+950	TYPE-II	25
528	391+950	391+975	TYPE-II	25
529	391+975	392+000	TYPE-II	25
530	392+000	392+025	TYPE-II	25
531	392+025	392+050	TYPE-II	14
532	392+050	392+075	TYPE-II	25
533	392+075	392+100	TYPE-IV	25
534	392+100	392+125	TYPE-IV	25
535	392+125	392+150	TYPE-IV	25
536	392+150	392+175	TYPE-IV	14
537	392+200	392+225	TYPE-I	0
538	392+225	392+250	TYPE-I	0
539	392+250	392+275	TYPE-I-A	25
540	392+275	392+300	TYPE-I-A	25
541	392+300	392+325	TYPE-I-A	25
542	392+325	392+350	TYPE-I-A	25
543	392+350	392+375	TYPE-I-A	25
544	392+375	392+400	TYPE-I-A	14
545	392+400	392+425	TYPE-I-A	25
546	392+425	392+450	TYPE-I-A	25
547	392+450	392+475	TYPE-I-A	25
548	392+475	392+500	TYPE-I-A	25
549	392+500	392+525	TYPE-II	25
550	392+525	392+550	TYPE-II	16
551	392+550	392+575	TYPE-I	25
552	392+575	392+600	TYPE-I	25
553	392+600	392+625	TYPE-I	25
554	392+625	392+650	TYPE-I	25
555	392+650	392+675	TYPE-I	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
556	392+675	392+700	TYPE-I-A	25
557	392+700	392+725	TYPE-I-A	14
558	392+725	392+750	TYPE-I-A	25
559	392+750	392+775	TYPE-I-A	25
560	392+775	392+800	TYPE-I-A	25
561	392+800	392+825	TYPE-I-A	25
562	392+825	392+850	TYPE-I-A	25
563	392+850	392+875	TYPE-I-A	25
564	392+875	392+900	TYPE-I-A	25
565	392+900	392+925	TYPE-I-A	14
566	392+925	392+950	TYPE-I-A	25
567	392+950	392+975	TYPE-I-A	25
568	392+975	393+000	TYPE-I-A	25
569	393+000	393+025	TYPE-I-A	25
570	393+025	393+050	TYPE-I-A	25
571	393+050	393+075	TYPE-II-B	14
572	393+075	393+100	TYPE-II-B	25
573	393+100	393+125	TYPE-II-B	25
574	393+125	393+150	TYPE-II-A	25
575	393+150	393+175	TYPE-II-A	25
576	393+175	393+200	TYPE-II	25
577	393+200	393+225	TYPE-II	25
578	393+225	393+250	TYPE-II	14
579	393+250	393+275	TYPE-II	25
580	393+275	393+300	TYPE-II	25
581	393+300	393+325	TYPE-II	25
582	393+325	393+350	TYPE-II	25
583	393+350	393+375	TYPE-II	14
584	393+375	393+400	TYPE-II	25
585	393+400	393+425	TYPE-II	25
586	393+425	393+450	TYPE-II	25
587	393+450	393+475	TYPE-II	25
588	393+475	393+500	TYPE-II	14
589	393+500	393+525	TYPE-II	25
590	393+525	393+550	TYPE-II	25
591	393+550	393+575	TYPE-II	14
592	393+575	393+600	TYPE-II	25
593	393+600	393+625	TYPE-II	25
594	393+625	393+650	TYPE-II	25
595	393+650	393+675	TYPE-II	25
596	393+675	393+700	TYPE-II	25
597	393+700	393+725	TYPE-II	14
598	393+725	393+750	TYPE-II	25
599	393+750	393+775	TYPE-II	25
600	393+775	393+800	TYPE-II	25
601	393+800	393+825	TYPE-II	25
602	393+825	393+850	TYPE-II	25
603	393+850	393+875	TYPE-II	25
604	393+875	393+900	TYPE-II	14

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
605	393+900	393+925	TYPE-II	25
606	393+925	393+950	TYPE-II	25
607	393+950	393+975	TYPE-II	14
608	393+975	394+000	TYPE-II	25
609	394+000	394+025	TYPE-II	25
610	394+025	394+050	TYPE-II	14
611	394+050	394+075	TYPE-II	25
612	394+075	394+100	TYPE-II	25
613	394+100	394+125	TYPE-II	25
614	394+125	394+150	TYPE-II	25
615	394+150	394+175	TYPE-II	25
616	394+175	394+200	TYPE-II	25
617	394+200	394+225	TYPE-II	25
618	394+225	394+250	TYPE-II	14
619	394+250	394+275	TYPE-II	25
620	394+275	394+300	TYPE-II	25
621	394+300	394+325	TYPE-II	25
622	394+325	394+350	TYPE-II	25
623	394+350	394+375	TYPE-II	25
624	394+375	394+400	TYPE-II	25
625	394+400	394+425	TYPE-II	25
626	394+425	394+450	TYPE-II	25
627	394+450	394+475	TYPE-II	25
628	394+475	394+500	TYPE-II	14
629	394+500	394+525	TYPE-II	25
630	394+525	394+550	TYPE-II	25
631	394+550	394+575	TYPE-II	25
632	394+575	394+600	TYPE-II	25
633	394+600	394+625	TYPE-II	25
634	394+625	394+650	TYPE-II	25
635	394+650	394+675	TYPE-II	25
636	394+675	394+700	TYPE-II-A	25
637	394+700	394+725	TYPE-II-A	14
638	394+725	394+750	TYPE-II-A	25
639	394+750	394+775	TYPE-II-A	25
640	394+775	394+800	TYPE-II-A	14
641	394+800	394+825	TYPE-II-A	25
642	394+825	394+850	TYPE-II-A	25
643	394+850	394+875	TYPE-II-A	25
644	394+875	394+900	TYPE-II-A	25
645	394+900	394+925	TYPE-II-A	14
646	394+925	394+950	TYPE-II-A	25
647	394+950	394+975	TYPE-II-A	25
648	394+975	395+000	TYPE-II-A	25
649	395+000	395+025	TYPE-II	25
650	395+025	395+050	TYPE-II	25
651	395+050	395+075	TYPE-II	25
652	395+075	395+100	TYPE-IV	25
653	395+100	395+125	TYPE-III-B	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
654	395+125	395+150	TYPE-I-C	14
655	395+150	395+175	TYPE-I-B	25
656	395+175	395+200	TYPE-I-A	25
657	395+200	395+225	TYPE-I-A	25
658	395+225	395+250	TYPE-I-A	25
659	395+250	395+275	TYPE-I-A	12
660	395+275	395+300	TYPE-I-A	25
661	395+300	395+325	TYPE-I-A	25
662	395+325	395+350	TYPE-I-B	25
663	395+350	395+375	TYPE-I-A	25
664	395+375	395+400	TYPE-I-A	25
665	395+400	395+425	TYPE-I-A	14
666	395+425	395+450	TYPE-I-A	25
667	395+450	395+475	TYPE-I-A	14
668	395+475	395+500	TYPE-I-A	25
669	395+500	395+525	TYPE-I-A	25
670	395+525	395+550	TYPE-I-A	25
671	395+550	395+575	TYPE-I-A	25
672	395+575	395+600	TYPE-II	25
673	395+600	395+625	TYPE-IV	25
674	395+625	395+650	TYPE-IV	25
675	395+650	395+675	TYPE-IV-B	14
676	395+675	395+700	TYPE-IV-B	25
677	395+700	395+725	TYPE-IV	25
678	395+725	395+750	TYPE-IV	25
679	395+750	395+775	TYPE-II-A	25
680	395+775	395+800	TYPE-II-A	25
681	395+800	395+825	TYPE-II-A	25
682	395+825	395+850	TYPE-II-A	25
683	395+850	395+875	TYPE-II-A	25
684	395+875	395+900	TYPE-II	14
685	395+900	395+925	TYPE-II	25
686	395+925	395+950	TYPE-II	25
687	395+950	395+975	TYPE-II	25
688	395+975	396+000	TYPE-IV	25
689	396+000	396+025	TYPE-IV	25
690	396+025	396+050	TYPE-II	14
691	396+050	396+075	TYPE-II	25
692	396+075	396+100	TYPE-II	25
693	396+100	396+125	TYPE-II	25
694	396+125	396+150	TYPE-II	25
695	396+150	396+175	TYPE-II	25
696	396+175	396+200	TYPE-II	25
697	396+200	396+225	TYPE-II	25
698	396+225	396+250	TYPE-II	25
699	396+250	396+275	TYPE-II	14
700	396+275	396+300	TYPE-II	25
701	396+300	396+325	TYPE-II	25
702	396+325	396+350	TYPE-II	25

S. No.	Design Chainage (m)		TCS Type	Length (m)
	From	To		
703	396+350	396+375	TYPE-II	25
704	396+375	396+400	TYPE-II	25
705	396+400	396+425	TYPE-IV	25
706	396+450	396+475	TYPE-IV-A	25
707	396+475	396+500	TYPE-II	25
708	396+500	396+525	TYPE-II	25
709	396+525	396+550	TYPE-II	25
710	396+550	396+575	TYPE-II	25
711	396+575	396+600	TYPE-II	14
712	396+600	396+625	TYPE-II	25
713	396+625	396+650	TYPE-II	25
714	396+650	396+675	TYPE-II	25
715	396+675	396+700	TYPE-II	14
716	396+700	396+725	TYPE-II	25
717	396+725	396+750	TYPE-II	14
718	396+750	396+775	TYPE-I	25
719	396+775	396+800	TYPE-I	25
720	396+800	396+825	TYPE-I	25
721	396+825	396+850	TYPE-I	25
722	396+850	396+875	TYPE-I	25
723	396+875	396+900	TYPE-II	25
724	396+900	396+925	TYPE-II	25
725	396+925	396+950	TYPE-II	25
726	396+950	396+975	TYPE-II	14
727	396+975	397+000	TYPE-II	25
728	397+000	397+025	TYPE-II	25
729	397+025	397+050	TYPE-II	25
730	397+050	397+075	TYPE-II	25
731	397+075	397+100	TYPE-II	25
732	397+100	397+125	TYPE-II	25
733	397+125	397+150	TYPE-II	25
734	397+150	397+175	TYPE-II	25
735	397+175	397+200	TYPE-II	14
736	397+200	397+225	TYPE-II	25
737	397+225	397+250	TYPE-II	25
738	397+250	397+275	TYPE-II	25
739	397+275	397+300	TYPE-II	14
740	397+300	397+325	TYPE-II	25
741	398+275	398+300	TYPE-II	25

7.9 Protection Work

Breast Wall have been proposed along the roadway edge on the hilly side of the section of project road where cutting is required or cutting is more than available ROW. In hilly sections, breast Wall of RCC/RE shall be provided.

Breast wall and Retaining wall shall be provided in accordance with the Manual of Specifications and Standards as referred in Schedule-D.

Retaining wall shall be proposed to be installed in sections of the project road having filling embankment. RCC retaining wall shall be proposed for filling upto 4m and for filling requiring more than 4m of heights RE wall shall be proposed.

(a) Retaining Wall:

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
1	368+000	368+025	TYPE-II-B	2	23
2	368+025	368+050	TYPE-II-B	3	25
3	368+350	368+375	New Bridge	3	10
4	368+375	368+400	TYPE-IV-A	3	10
5	368+550	368+575	TYPE-II-B	4	24
6	368+750	368+775	TYPE-II-B	3	25
7	368+775	368+800	TYPE-II-B	3	25
8	368+825	368+850	TYPE-I	3	25
9	368+850	368+875	TYPE-I	3	12
10	368+975	369+000	TYPE-I	3	25
11	369+000	369+025	TYPE-I	3	23
12	369+225	369+250	TYPE-I	2	23
13	369+525	369+550	TYPE-II-B	3	21
14	369+550	369+575	TYPE-II-B	3	25
15	370+050	370+075	TYPE-V-B	2	23
16	370+075	370+100	TYPE-V-B	2	23
17	370+100	370+125	TYPE-V-B	2	23
18	370+125	370+150	TYPE-V-B	2	23
19	370+150	370+175	TYPE-V-B	3	25
20	370+175	370+200	TYPE-V-B	2	23
21	370+275	370+300	TYPE-V-B	4	25
22	370+675	370+700	TYPE-III-B	4	12
23	370+700	370+725	TYPE-III-B	4	25
24	370+750	370+775	TYPE-I	3	25
25	370+775	370+800	TYPE-I	4	14
26	370+850	370+875	TYPE-I	2	23
27	371+175	371+200	TYPE-I	3	16
28	371+200	371+225	TYPE-I	3	25
29	371+225	371+250	TYPE-I	3	25
30	371+250	371+275	TYPE-I	3	25
31	372+750	372+775	TYPE-V-B	2	23
32	372+775	372+800	TYPE-V-B	2	23
33	372+800	372+825	TYPE-V-B	2	23
34	373+200	373+225	TYPE-II-B	3	21
35	373+225	373+250	TYPE-II-B	4	12
36	373+250	373+275	TYPE-II-B	3	23

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
37	373+450	373+475	TYPE-II-B	2	23
38	373+475	373+500	TYPE-II-B	2	23
39	373+650	373+675	TYPE-II-B	3	25
40	373+675	373+700	TYPE-II-B	3	25
41	373+750	373+775	TYPE-V-C	2	23
42	373+775	373+800	TYPE-V-B	2	23
43	373+975	374+000	TYPE-V-B	2	23
44	374+000	374+025	TYPE-V-B	3	21
45	374+375	374+400	TYPE-I	3	25
46	374+400	374+425	TYPE-I	3	12
47	374+800	374+825	TYPE-I	2	23
48	375+025	375+050	TYPE-I	2	23
49	375+125	375+150	TYPE-II-B	2	23
50	375+150	375+175	TYPE-II-B	2	23
51	375+175	375+200	TYPE-II-B	2	25
52	375+475	375+500	TYPE-II-B	2	25
53	375+500	375+525	TYPE-II-B	2	25
54	375+550	375+575	TYPE-II-B	2	23
55	375+575	375+600	TYPE-II-B	2	23
56	375+775	375+800	TYPE-II-B	3	25
57	376+200	376+225	TYPE-I	2	23
58	376+400	376+425	TYPE-II-B	2	23
59	376+425	376+450	TYPE-II-B	2	23
60	377+175	377+200	TYPE-III-B	2	23
61	377+200	377+225	TYPE-III-B	2	23
62	380+750	380+775	TYPE-V-B	2	23
63	380+775	380+800	TYPE-V-B	4	25
64	383+800	383+825	TYPE-II-B	2	23
65	383+825	383+850	TYPE-II-B	2	23
66	384+100	384+125	TYPE-II-B	2	23
67	384+175	384+200	TYPE-II-B	3	25
68	384+200	384+225	TYPE-II-B	3	25
69	384+225	384+250	TYPE-II-B	3	25
70	384+250	384+275	TYPE-II-B	2	23
71	384+475	384+500	TYPE-II-B	3	25
72	384+500	384+525	TYPE-II-B	4	12
73	384+525	384+550	TYPE-II-B	4	25
74	384+575	384+600	TYPE-II-B	4	25
75	384+600	384+625	TYPE-II-B	4	25
76	384+625	384+650	TYPE-II-B	4	25
77	384+750	384+775	TYPE-I	2	23
78	384+775	384+800	TYPE-I	4	25
79	384+950	384+975	TYPE-I	2	23
80	384+975	385+000	TYPE-I	2	23

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
81	385+125	385+150	TYPE-I	4	14
82	385+400	385+425	TYPE-I	2	23
83	385+425	385+450	TYPE-I	2	23
84	385+475	385+500	TYPE-I	3	25
85	385+575	385+600	New Bridge	2	15
86	385+600	385+625	TYPE-I	2	15
87	385+625	385+650	TYPE-I-C	2	25
88	385+800	385+825	TYPE-I	2	25
89	385+825	385+850	TYPE-I	2	25
90	385+925	385+950	TYPE-I	3	23
91	385+950	385+975	TYPE-I-B	3	23
92	385+975	386+000	TYPE-I-B	2	25
93	386+250	386+275	TYPE-I	2	23
94	386+275	386+300	TYPE-I	2	23
95	386+300	386+325	New Bridge	2	5
96	386+325	386+350	TYPE-I	2	25
97	386+450	386+475	TYPE-I-B	2	25
98	386+525	386+550	TYPE-I	2	25
99	388+025	388+050	TYPE-V-B	3	21
100	388+050	388+075	TYPE-V-B	4	25
101	388+075	388+100	TYPE-V-B	4	14
102	388+600	388+625	TYPE-V-C	2	23
103	388+625	388+650	TYPE-V-C	2	25
104	389+350	389+375	TYPE-V-B	2	25
105	389+375	389+400	TYPE-V-B	2	25
106	389+450	389+475	TYPE-V-B	2	25
107	389+475	389+500	TYPE-V-B	2	25
108	389+700	389+725	TYPE-V-B	2	25
109	389+725	389+750	TYPE-V-B	2	23
110	389+750	389+775	TYPE-V-B	2	23
111	389+775	389+800	TYPE-V-B	2	23
112	389+800	389+825	TYPE-V-B	2	23
113	389+825	389+850	TYPE-V-B	2	23
114	390+150	390+175	TYPE-V-B	2	23
115	390+175	390+200	TYPE-V-B	2	23
116	390+200	390+225	TYPE-V-B	2	23
117	390+225	390+250	TYPE-V-B	2	23
118	390+250	390+275	TYPE-V-B	2	23
119	390+275	390+300	TYPE-V-B	2	23
120	390+300	390+325	TYPE-V-B	2	23
121	390+325	390+350	TYPE-V-B	2	23
122	390+425	390+450	TYPE-V-B	2	23
123	390+450	390+475	TYPE-V-B	2	23
124	390+475	390+500	TYPE-V-B	2	23

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
125	390+500	390+525	TYPE-V-B	2	23
126	390+525	390+550	TYPE-V-B	2	23
127	390+550	390+575	TYPE-V-B	2	23
128	390+575	390+600	TYPE-V-B	2	23
129	390+600	390+625	TYPE-V-B	2	23
130	390+625	390+650	TYPE-I	2	23
131	390+675	390+700	TYPE-III-B	4	25
132	390+700	390+725	TYPE-V-B	4	14
133	390+775	390+800	TYPE-V-B	2	23
134	390+800	390+825	TYPE-V-B	2	25
135	390+825	390+850	TYPE-V-B	2	23
136	390+900	390+925	TYPE-V-B	1	24
137	390+925	390+950	TYPE-V-B	1	24
138	390+950	390+975	TYPE-II-B	1	24
139	391+375	391+400	TYPE-I-B	2	23
140	391+400	391+425	TYPE-III-B	2	23
141	391+500	391+525	TYPE-I	2	23
142	391+625	391+650	TYPE-I-B	2	23
143	391+650	391+675	TYPE-I-B	2	23
144	391+850	391+875	TYPE-I	1	24
145	391+875	391+900	TYPE-I	1	24
146	392+575	392+600	TYPE-I	2	23
147	392+600	392+625	TYPE-I	2	23
148	393+050	393+075	TYPE-II-B	3	14
149	393+075	393+100	TYPE-II-B	3	25
150	393+100	393+125	TYPE-II-B	2	23
151	395+100	395+125	TYPE-III-B	2	23
152	395+125	395+150	TYPE-I-C	3	14
153	395+150	395+175	TYPE-I-B	3	21
154	395+325	395+350	TYPE-I-B	1	24
155	396+425	396+450	New Bridge	4	0
156	396+450	396+475	TYPE-IV-A	4	25
157	397+325	397+350	TYPE-V-B	1	24
158	397+350	397+375	TYPE-V-B	3	25
159	397+375	397+400	TYPE-V-B	2	23
160	397+400	397+425	TYPE-V-B	2	23
161	397+425	397+450	TYPE-V-B	4	25
162	397+450	397+475	TYPE-V-B	4	25
163	397+475	397+500	TYPE-V-B	4	14

(b) Breast Wall

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
1	368+875	368+900	TYPE-I-A	1	25
2	368+900	368+925	TYPE-I-A	1	25
3	368+925	368+950	TYPE-I-A	2	25
4	368+950	368+975	TYPE-I-A	2	25
5	369+050	369+075	TYPE-I-A	2	25
6	369+075	369+100	TYPE-I-A	2	16
7	369+450	369+475	TYPE-II-A	2	25
8	371+375	371+400	TYPE-I-A	2	14
9	371+400	371+425	TYPE-I-A	2	25
10	371+425	371+450	TYPE-I-A	2	14
11	371+575	371+600	TYPE-V-A	2	25
12	371+625	371+650	TYPE-V-A	1	25
13	372+350	372+375	TYPE-V-A	1	25
14	372+375	372+400	TYPE-V-A	1	25
15	372+400	372+425	TYPE-V-A	1	25
16	372+425	372+450	TYPE-V-A	2	25
17	372+550	372+575	TYPE-V-A	2	25
18	372+575	372+600	TYPE-V-A	2	25
19	372+600	372+625	TYPE-V-A	2	25
20	372+625	372+650	TYPE-V-A	2	16
21	372+650	372+675	TYPE-V-A	2	25
22	372+675	372+700	TYPE-V-A	2	25
23	372+700	372+725	TYPE-V-A	2	18
24	372+725	372+750	TYPE-V-A	2	14
25	372+900	372+925	TYPE-V-A	1	21
26	372+925	372+950	TYPE-V-A	1	25
27	372+950	372+975	TYPE-I-A	1	25
28	372+975	373+000	TYPE-I-A	2	16
29	373+000	373+025	TYPE-I-A	2	25
30	373+025	373+050	TYPE-I-A	2	25
31	373+050	373+075	TYPE-I-A	2	25
32	373+700	373+725	TYPE-II-A	2	25
33	373+725	373+750	TYPE-II-A	2	25
34	373+750	373+775	TYPE-V-C	2	25
35	376+525	376+550	TYPE-I-A	2	25
36	376+550	376+575	TYPE-I-A	2	25

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
37	376+575	376+600	TYPE-I-A	2	25
38	376+600	376+625	TYPE-I-A	2	25
39	376+625	376+650	TYPE-I-A	2	16
40	376+650	376+675	TYPE-III-A	2	25
41	376+675	376+700	TYPE-III-A	2	25
42	376+700	376+725	TYPE-III-A	2	25
43	376+725	376+750	TYPE-I-A	2	25
44	380+125	380+150	TYPE-V-A	2	25
45	380+150	380+175	TYPE-V-A	2	25
46	380+175	380+200	TYPE-V-A	2	25
47	380+200	380+225	TYPE-V-A	2	25
48	380+450	380+475	TYPE-V-A	2	25
49	380+475	380+500	TYPE-V-A	2	25
50	380+575	380+600	TYPE-V-A	2	25
51	381+125	381+150	TYPE-V-A	3	25
52	381+150	381+175	TYPE-V-A	3	25
53	381+175	381+200	TYPE-V-A	3	14
54	381+200	381+225	TYPE-V-B	3	25
55	382+425	382+450	TYPE-V-A	1	25
56	382+450	382+475	TYPE-V-A	1	25
57	382+525	382+550	TYPE-V-A	1	25
58	382+550	382+575	TYPE-V-A	1	12
59	382+575	382+600	TYPE-V-A	2	25
60	382+600	382+625	TYPE-V-A	2	25
61	382+625	382+650	TYPE-V-A	2	25
62	382+650	382+675	TYPE-V-A	2	25
63	382+675	382+700	TYPE-V-A	2	25
64	382+925	382+950	TYPE-V-A	2	25
65	383+150	383+175	TYPE-V-A	3	14
66	383+175	383+200	TYPE-V-A	3	25
67	383+200	383+225	TYPE-V-A	3	25
68	383+225	383+250	TYPE-V-A	3	25
69	383+250	383+275	TYPE-V-A	2	25
70	383+325	383+350	TYPE-V-A	2	25
71	383+350	383+375	TYPE-V-A	1	25
72	383+375	383+400	TYPE-V-A	1	25
73	383+450	383+475	TYPE-V-A	1	25
74	383+475	383+500	TYPE-V-A	1	25
75	383+500	383+525	TYPE-V-A	1	25
76	383+600	383+625	TYPE-V-A	1	25
77	383+625	383+650	TYPE-I-A	2	25
78	383+725	383+750	TYPE-II-A	2	25
79	383+750	383+775	TYPE-II-A	2	25

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
80	383+775	383+800	TYPE-II-A	2	25
81	384+800	384+825	TYPE-I-A	2	25
82	384+825	384+850	TYPE-I-A	2	25
83	384+850	384+875	TYPE-I-A	2	25
84	385+500	385+525	TYPE-I-A	2	12
85	385+525	385+550	TYPE-III-A	2	25
86	385+550	385+575	TYPE-III-A	2	25
87	385+625	385+650	TYPE-I-C	2	25
88	385+650	385+675	TYPE-I-A	2	14
89	385+675	385+700	TYPE-I-A	2	25
90	385+700	385+725	TYPE-I-A	2	25
91	385+725	385+750	TYPE-I-A	3	25
92	385+750	385+775	TYPE-I-A	3	25
93	385+775	385+800	TYPE-I-A	3	25
94	385+950	385+975	TYPE-I-B	2	25
95	385+975	386+000	TYPE-I-B	2	25
96	386+000	386+025	TYPE-I-A	2	25
97	386+025	386+050	TYPE-I-A	2	25
98	386+050	386+075	TYPE-I-A	2	25
99	386+075	386+100	TYPE-I-A	2	14
100	386+100	386+125	TYPE-I-A	2	25
101	386+125	386+150	TYPE-I-A	2	25
102	386+150	386+175	TYPE-I-A	2	25
103	386+175	386+200	TYPE-I-A	2	25
104	386+200	386+225	TYPE-I-A	2	25
105	386+450	386+475	TYPE-I-B	2	25
106	386+475	386+500	TYPE-I-A	2	25
107	386+500	386+525	TYPE-I-A	2	25
108	386+575	386+600	TYPE-I-A	2	25
109	386+600	386+625	TYPE-I-A	2	25
110	386+625	386+650	TYPE-I-A	2	25
111	387+700	387+725	TYPE-I-A	2	25
112	387+725	387+750	TYPE-I-A	2	25
113	387+750	387+775	TYPE-I-A	2	25
114	387+775	387+800	TYPE-I-A	2	25
115	387+800	387+825	TYPE-I-A	2	25
116	387+825	387+850	TYPE-I-A	2	16
117	387+850	387+875	TYPE-I-A	2	25
118	387+950	387+975	TYPE-V-A	3	25
119	388+175	388+200	TYPE-V-B	3	25
120	388+200	388+225	TYPE-V-B	3	25
121	388+225	388+250	TYPE-V-B	3	25
122	388+250	388+275	TYPE-V-A	2	14

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
123	388+275	388+300	TYPE-V-A	2	25
124	388+300	388+325	TYPE-V-A	1	25
125	388+325	388+350	TYPE-V-A	1	14
126	388+350	388+375	TYPE-V-A	1	25
127	388+425	388+450	TYPE-V-A	1	25
128	388+450	388+475	TYPE-V-A	2	14
129	388+475	388+500	TYPE-V-A	2	25
130	388+500	388+525	TYPE-V-A	2	25
131	388+525	388+550	TYPE-V-A	2	14
132	388+550	388+575	TYPE-V-A	2	25
133	388+575	388+600	TYPE-V-B	2	25
134	388+600	388+625	TYPE-V-C	2	25
135	388+625	388+650	TYPE-V-C	2	25
136	390+375	390+400	TYPE-V-A	2	25
137	390+400	390+425	TYPE-V-A	2	25
138	390+850	390+875	TYPE-V-A	2	25
139	391+175	391+200	TYPE-II-A	2	14
140	391+275	391+300	TYPE-I-A	1	25
141	391+300	391+325	TYPE-I-A	1	25
142	391+325	391+350	TYPE-I-A	1	25
143	391+350	391+375	TYPE-I-A	1	25
144	391+375	391+400	TYPE-I-B	2	25
145	391+425	391+450	TYPE-III-A	2	25
146	391+450	391+475	TYPE-III-A	2	25
147	391+475	391+500	TYPE-III-A	2	25
148	391+525	391+550	TYPE-I-A	2	14
149	391+550	391+575	TYPE-I-A	2	25
150	391+575	391+600	TYPE-I-A	2	25
151	391+600	391+625	TYPE-I-A	2	25
152	391+625	391+650	TYPE-I-B	2	25
153	391+650	391+675	TYPE-I-B	2	25
154	391+800	391+825	TYPE-III-A	1	25
155	391+825	391+850	TYPE-I-A	1	25
156	392+250	392+275	TYPE-I-A	1	25
157	392+275	392+300	TYPE-I-A	1	25
158	392+300	392+325	TYPE-I-A	2	25
159	392+325	392+350	TYPE-I-A	2	25
160	392+350	392+375	TYPE-I-A	2	25
161	392+375	392+400	TYPE-I-A	4	14
162	392+400	392+425	TYPE-I-A	4	25
163	392+425	392+450	TYPE-I-A	4	25
164	392+450	392+475	TYPE-I-A	4	25
165	392+475	392+500	TYPE-I-A	4	25

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
166	392+675	392+700	TYPE-I-A	2	25
167	392+700	392+725	TYPE-I-A	2	14
168	392+725	392+750	TYPE-I-A	2	25
169	392+750	392+775	TYPE-I-A	2	25
170	392+775	392+800	TYPE-I-A	1	25
171	392+800	392+825	TYPE-I-A	1	25
172	392+825	392+850	TYPE-I-A	1	25
173	392+850	392+875	TYPE-I-A	1	25
174	392+875	392+900	TYPE-I-A	2	25
175	392+900	392+925	TYPE-I-A	2	14
176	392+925	392+950	TYPE-I-A	2	25
177	392+950	392+975	TYPE-I-A	2	25
178	392+975	393+000	TYPE-I-A	2	25
179	393+000	393+025	TYPE-I-A	4	25
180	393+025	393+050	TYPE-I-A	2	25
181	393+125	393+150	TYPE-II-A	2	25
182	393+150	393+175	TYPE-II-A	2	25
183	394+675	394+700	TYPE-II-A	2	25
184	394+700	394+725	TYPE-II-A	2	14
185	394+725	394+750	TYPE-II-A	1	25
186	394+750	394+775	TYPE-II-A	1	25
187	394+775	394+800	TYPE-II-A	1	14
188	394+800	394+825	TYPE-II-A	1	25
189	394+825	394+850	TYPE-II-A	1	25
190	394+850	394+875	TYPE-II-A	1	25
191	394+875	394+900	TYPE-II-A	1	25
192	394+900	394+925	TYPE-II-A	1	14
193	394+925	394+950	TYPE-II-A	1	25
194	394+950	394+975	TYPE-II-A	1	25
195	394+975	395+000	TYPE-II-A	2	25
196	395+125	395+150	TYPE-I-C	2	14
197	395+150	395+175	TYPE-I-B	2	25
198	395+175	395+200	TYPE-I-A	2	25
199	395+200	395+225	TYPE-I-A	2	25
200	395+225	395+250	TYPE-I-A	2	25
201	395+250	395+275	TYPE-I-A	1	12
202	395+275	395+300	TYPE-I-A	1	25
203	395+300	395+325	TYPE-I-A	2	25
204	395+325	395+350	TYPE-I-B	2	25
205	395+350	395+375	TYPE-I-A	2	25
206	395+375	395+400	TYPE-I-A	2	25
207	395+400	395+425	TYPE-I-A	1	14
208	395+425	395+450	TYPE-I-A	1	25

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work(m)
	From	To			
209	395+450	395+475	TYPE-I-A	1	14
210	395+475	395+500	TYPE-I-A	1	25
211	395+500	395+525	TYPE-I-A	2	25
212	395+525	395+550	TYPE-I-A	2	25
213	395+550	395+575	TYPE-I-A	2	25
214	395+750	395+775	TYPE-II-A	2	25
215	395+775	395+800	TYPE-II-A	2	25
216	395+800	395+825	TYPE-II-A	1	25
217	395+825	395+850	TYPE-II-A	2	25
218	395+850	395+875	TYPE-II-A	2	25

(c) Reinforced earth Wall:

S. No.	Design Chainage (km)		TCS Type	Height of Protection work (m)	Length of Protection work (m)
	From	To			
1	376+025	376+050	TYPE-I	8	25
2	376+050	376+075	TYPE-I	8	14
3	376+075	376+100	TYPE-I	8	25
4	376+300	376+325	TYPE-I	8	14
5	376+325	376+350	TYPE-I	8	25
6	378+175	378+200	TYPE-V-D	8	25
7	378+200	378+225	TYPE-V-D	8	25
8	381+225	381+250	TYPE-V-D	6	25
9	381+250	381+275	TYPE-V-D	6	25
10	385+175	385+200	TYPE-III-C	10	25
11	385+200	385+225	TYPE-III-C	10	12
12	385+225	385+250	TYPE-I	8	25
13	385+275	385+300	TYPE-III-C	10	25
14	385+325	385+350	TYPE-I	8	25
15	385+350	385+375	TYPE-I	8	25
16	395650	395675	TYPE-IV-B	6	14
17	395675	395700	TYPE-IV-B	6	25

Note:

- The contractor shall be responsible for accurate assessment of the actual requirement as per site situation and prepare design for slope protection and stabilization as per specification and standards stipulated in schedule-D and submit the same to the Authority's Engineer/Authority for review through the Proof Consultant and implement it accordingly thereafter

- Any increase in quantity over and above the tentative quantity as mentioned in above table or through change in specifications will not be considered as change of scope.

Therefore, Contractor shall make through investigation at site and assess the requirement of slope protection and slide prone zone and other safety feature at his own before submission of bid.

- For executing any of the above type of slope protection works, the contractor should have the experience of having executed, in last 5 (five) financial years from the date of signing of Agreement, at least 40% quantity of that type of slope protection works and provide requisite certificates/documents to verify the same to the Authority/ Authority engineer.

- If the Contractor does not have requisite experience for any/some of the above type of slope protection works, then he has to engage specialized firm(s) as sub-contractor(s) who has/have successfully completed in last 5(five) financial years atleast 40% quantity of such works. The contractor shall submit the credentials and the qualifying experience of the specialized sub-contractor(s) for approval of Authority before the commencement of such slope protection works.

7.9 The unused/un-disposed excavated material can be dumped along the road by using crate wall to create extra width for passing place/ parking place. Contractor has to ensure that no debris should spill beyond ROW handed over to contractor. In case of any violation the whole responsibility will be the contractor. For excess excavated material over and above the fill requirement the contractor will ensure safe disposal as per the law in extent.

8. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORK.

8.1 Traffic control devices and road safety works shall be provided in accordance with Section 9 of the IRC: SP: 73-2015 and IRC: SP: 48-1998.

8.2 Specifications of the reflective sheeting shall be as per the Manual of Specifications (IRC: SP: 73-2015) & (IRC: SP: 48-1998).

9. ROAD SIDE FURNITURE

9.1 Road side furniture shall be provided in accordance with the provisions of Section 9 and 12 of the Manual and as well given in Schedule-C.

9.2 Overhead traffic signs: location and size

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

10. COMPULSORY AFFORESTATION

Nil

11. 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		

12. SPECIAL REQUIREMENTS FOR HILL ROAD

In accordance with the section 13 of the manual (IRC: SP 73:2015 & IRC: SP 48:1998) and recommended practices for the treatment of embankment and road side slopes erosion control and relevant IRC.

13. CHANGE OF SCOPE

The length of Structures, bridges and slope protection works whatsoever in terms of retaining wall, breast wall and reinforced earth wall or under special requirement of hill slope specified herein above shall be treated as an approximate assessment. The actual lengths and height as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the specification and standards. Any variations in the lengths and specifications given in the schedule–B shall not constitute a change of Scope.

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Appendix-I

Annex-I

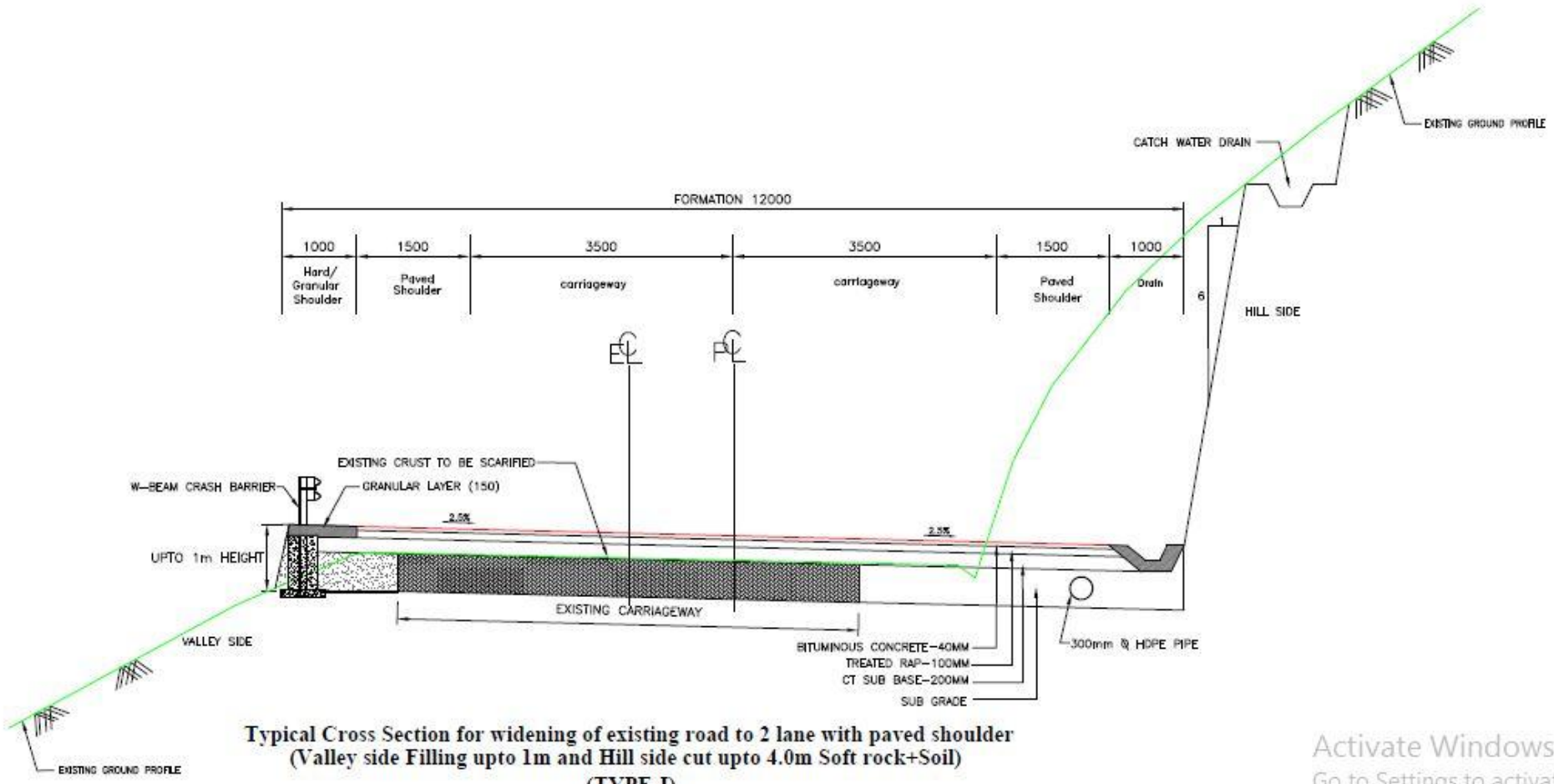
(Schedule B)

TYPICAL CROSS-SECTIONS

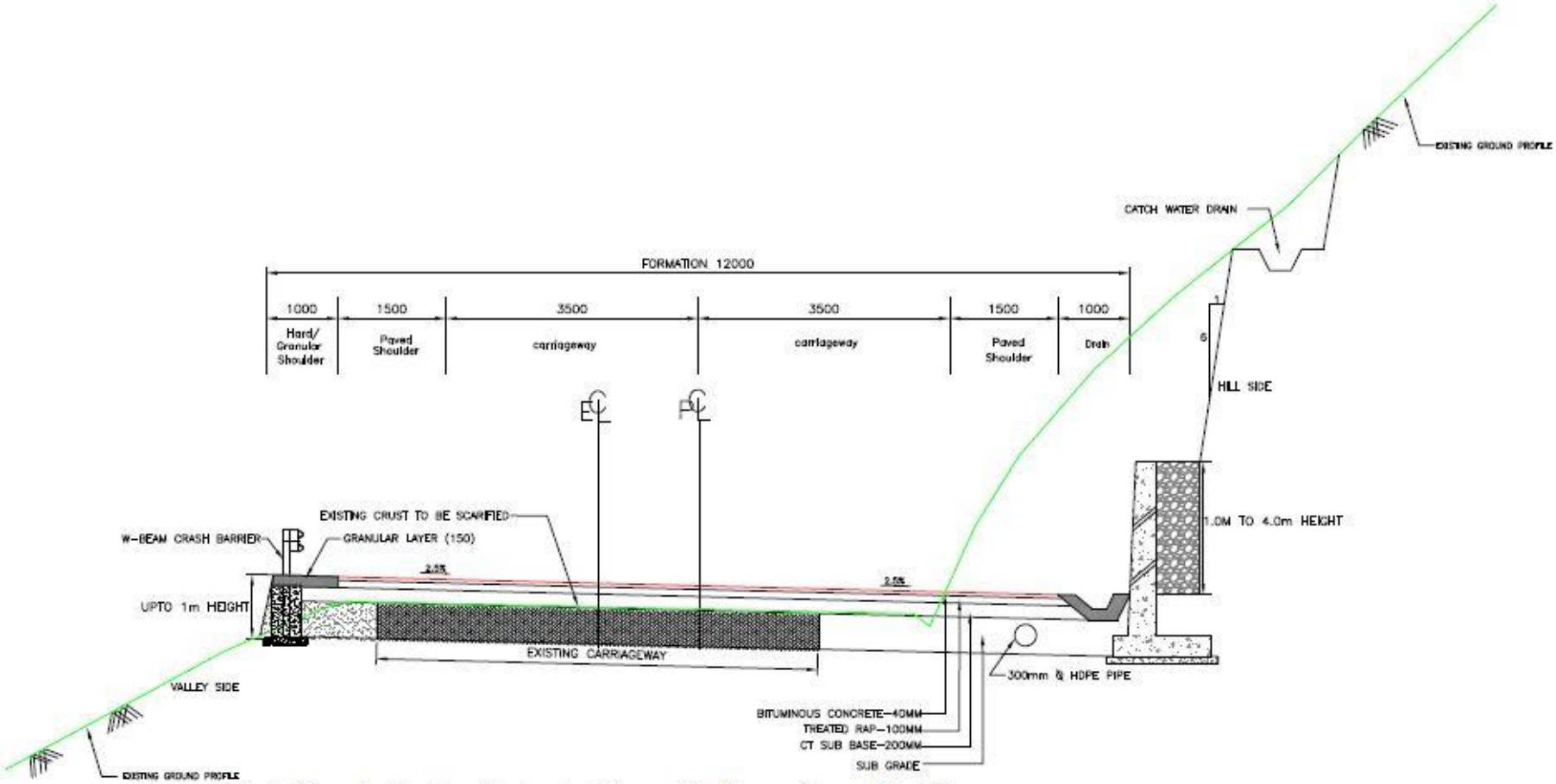
Summary of Typical Cross Sections*

S No	Type	Description
1	I	Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side cut upto 4.0m (Soft rock+Soil)
2	IA	Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side upto 4.0m (Soft rock+Soil)
3	IB	Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 4 m and Hill side upto 4.0m protection (Soft rock+Soil)
4	IC	Typical Cross Section for 2 lane with paved shoulder in fill section Both Side upto 4.0m protection (Soft rock+Soil)
5	ID	Typical Cross Section for 2 lane with paved shoulder in fill section (Both Side upto 4.0m protection Soft rock+Soil)
6	II	Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side cut in hard rock
7	IIA	Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side upto 4m protection hard rock
8	IIB	Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side upto 4m protection and hill side cut in hard rock
9	III	Typical Cross Section for realignment and bypass (Valley side filling upto 1m and hill side cut upto 4m (Soft rock+ Soil)
10	IIIA	Typical Cross Section for realignment and bypass (Valley side filling upto 1m and hill side upto 4m protection (Soft rock+ Soil)
11	IIIB	Typical Cross Section for realignment and bypass (Valley side filling upto 4m and hill side upto 4m cutting (Soft rock+ Soil)
12	IIIC	Typical Cross Section for realignment and bypass (Valley side filling >4m in soft rock)
13	IV	Typical Cross Section for realignment and bypass Valley side Filling upto 1m and hill side cut hard rock)
14	IVA	Typical Cross Section for realignment and bypass (Valley side filling upto 4m and hill side cut in hard rock)
15	IVB	Typical Cross Section for realignment and bypass (Both sides protection in hard rock)
16	V	Typical Cross Section for 2 lane with paved shoulder & Raised Footpath cum drain in built-up area) (12.0m formation width)
17	VA	Typical Cross Section for 2 lane with paved shoulder & Raised Footpath cum drain in built-up area)

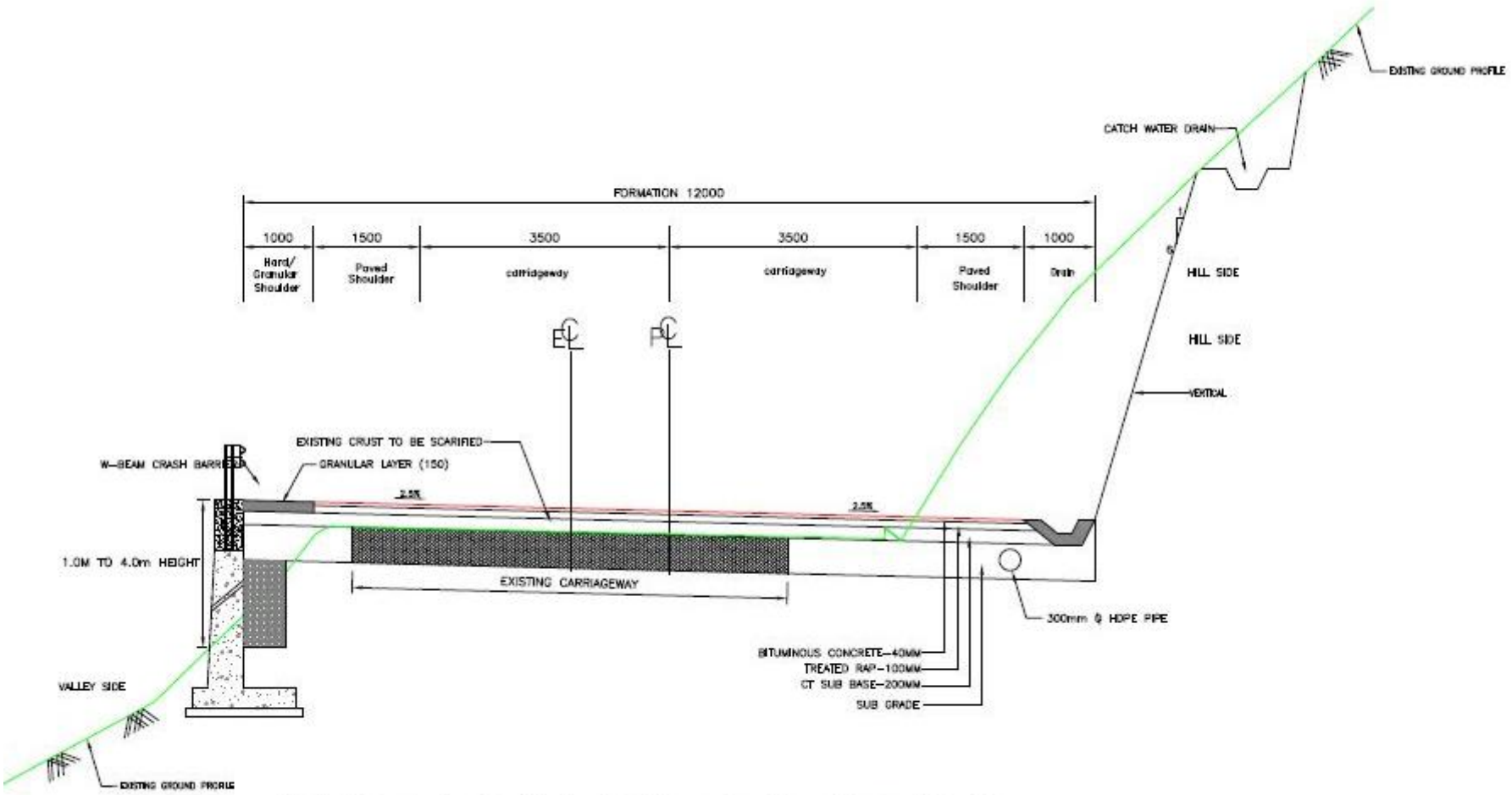
S No	Type	Description
		(hill side upto 4m protection) (12.0m formation width)
18	VB	Typical Cross Section for 2 lane with paved shoulder & Raised Footpath cum drain in built-up area) (vally side upto 4m protection and hill side no protection) (12.0m formation width)
19	VC	Typical Cross Section for 2 lane with paved shoulder & Raised Footpath cum drain in built-up area) (both side protection upto 4m) (12.0m formation width)
20	VD	Typical Cross Section for 2 lane with paved shoulder & Raised Footpath cum drain in built-up area) (vally side protection> 4.0m) (12.0m formation width)



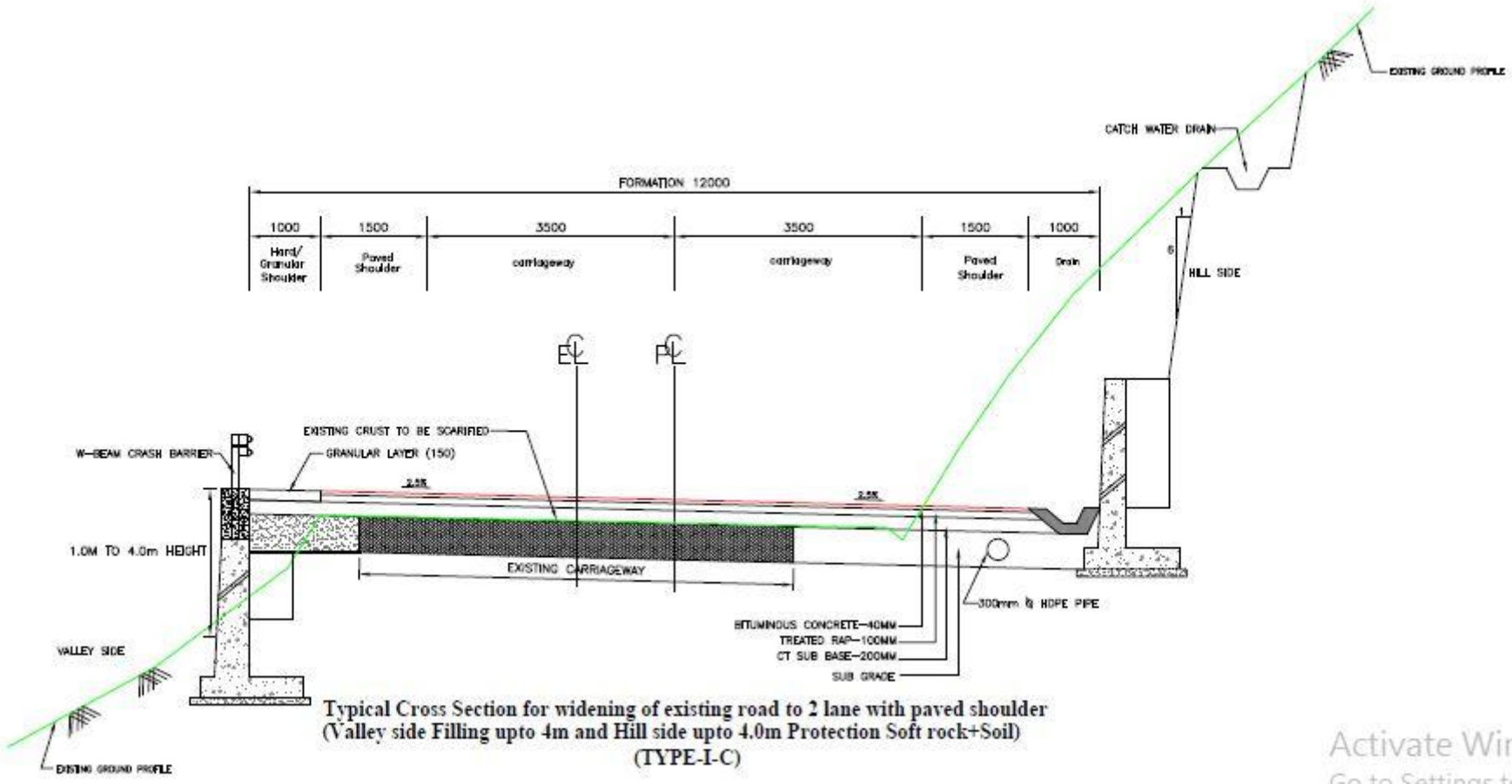
Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side cut upto 4.0m Soft rock+Soil) (TYPE-I)



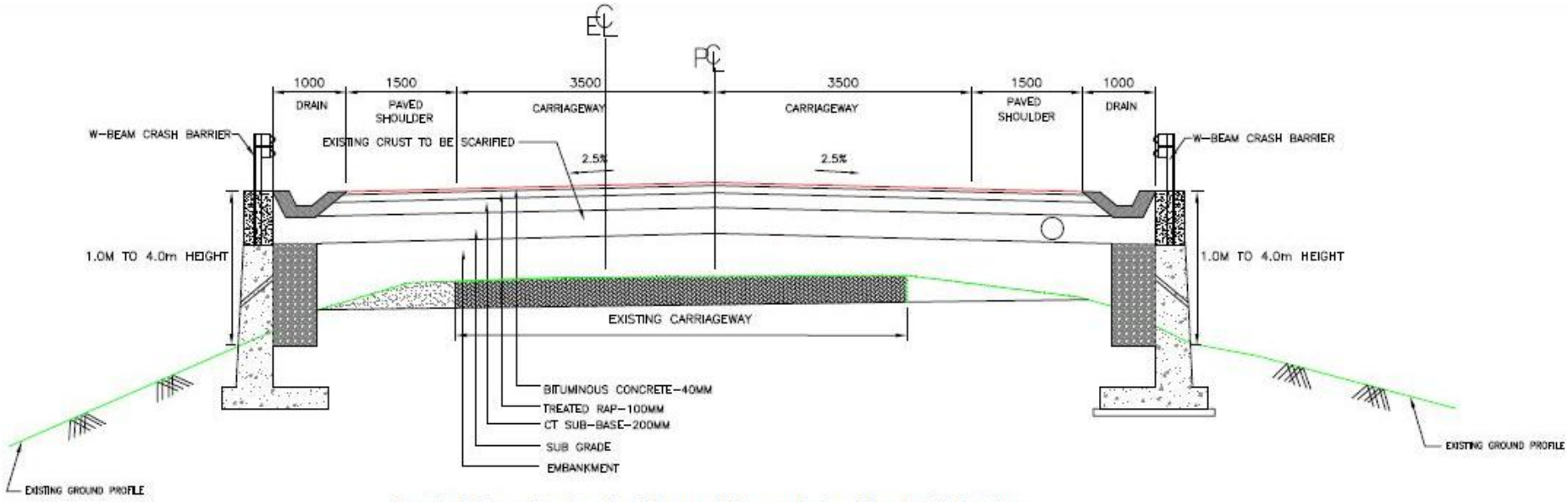
Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side upto 4.0m Protection Soft rock+Soil) (TYPE-I-A)



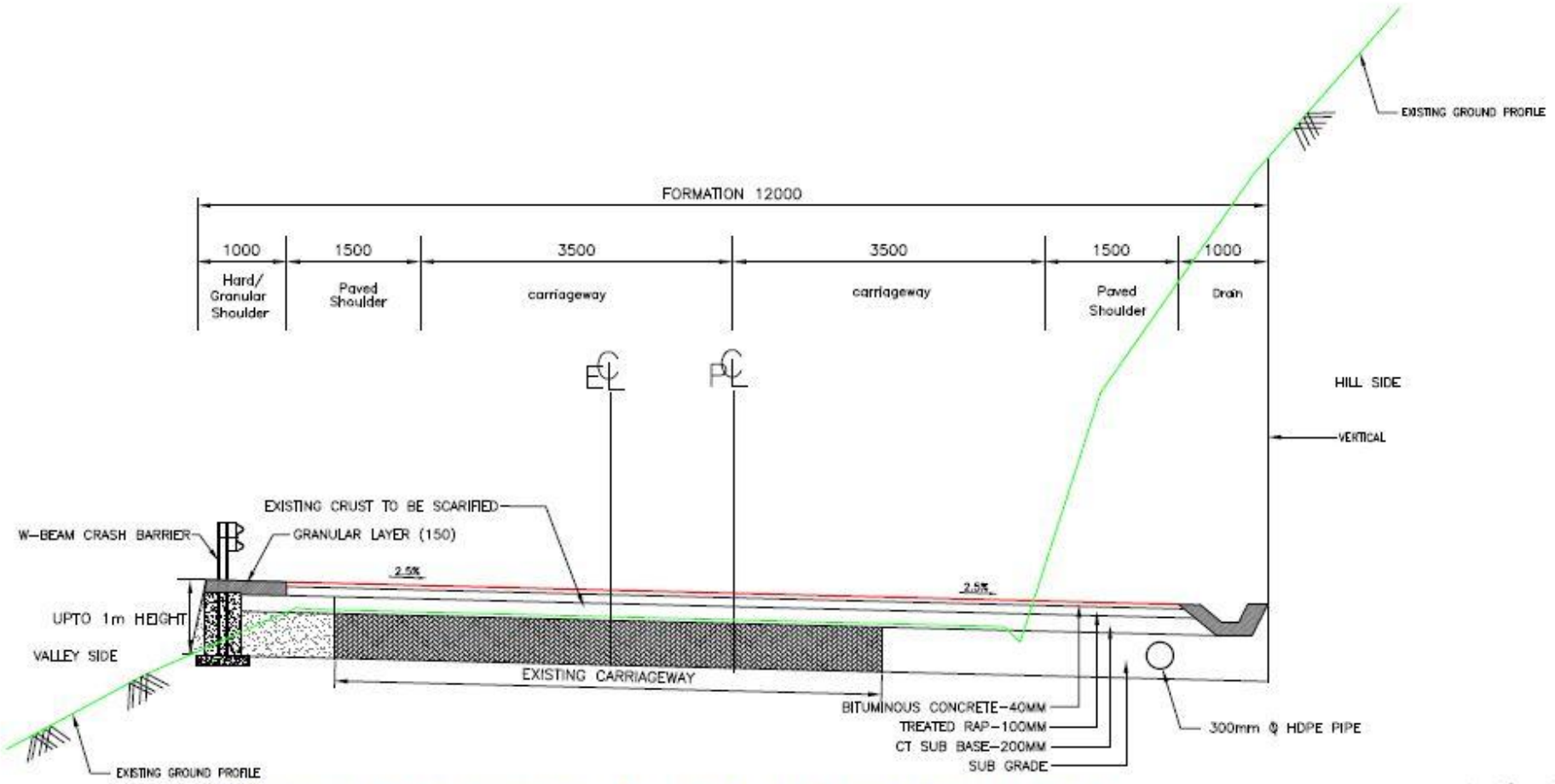
Typical Cross Section for widening of existing road to 2 lane with paved shoulder
(Valley side Filling upto 4m Protection Soft rock+Soil)
(TYPE-I-B)



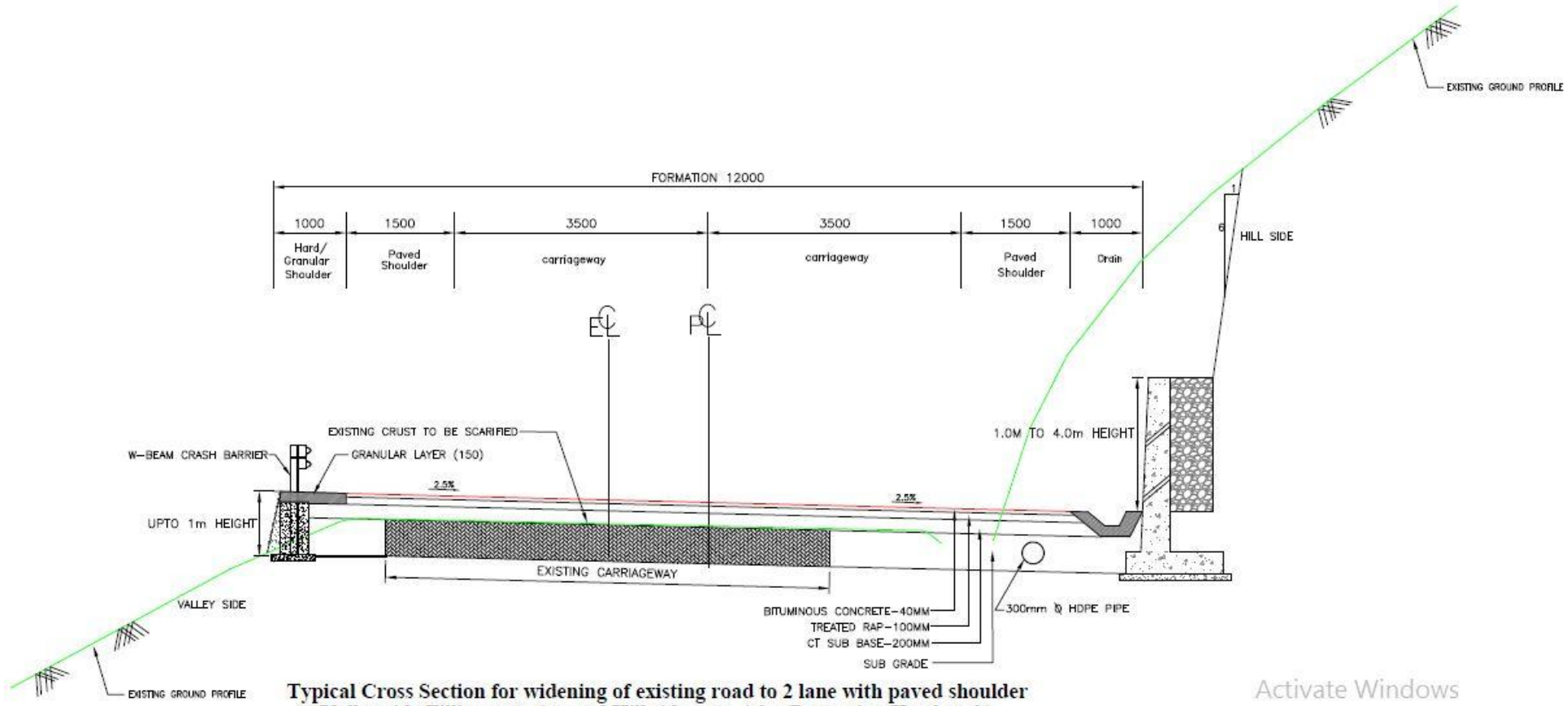
Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 4m and Hill side upto 4.0m Protection Soft rock+Soil) (TYPE-I-C)



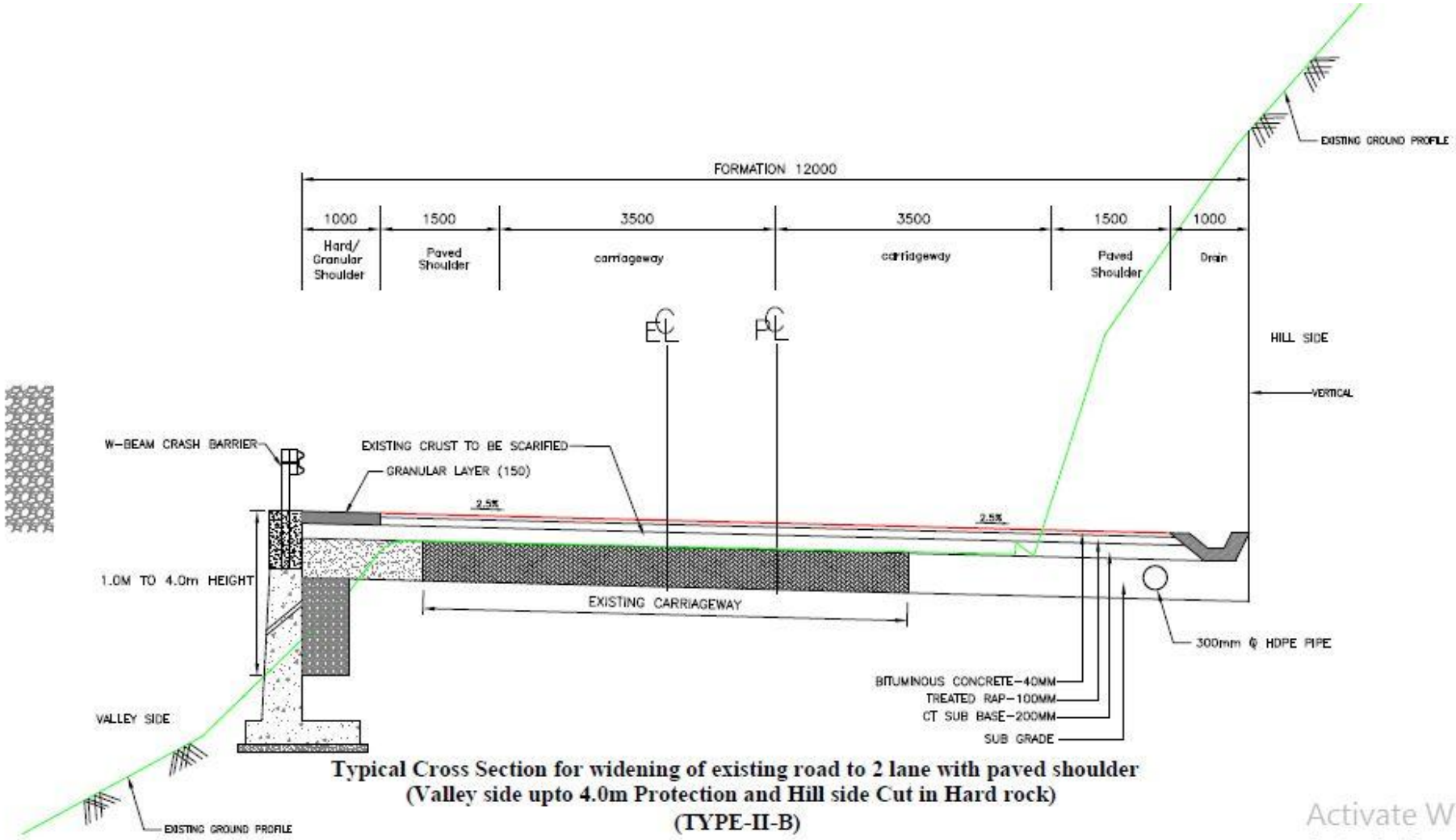
Typical Cross Section for 2 Lane with paved shoulder in fill Section
(Both sides upto 4.0m Protection Soft rock+Soil)
(TYPE-1-D)



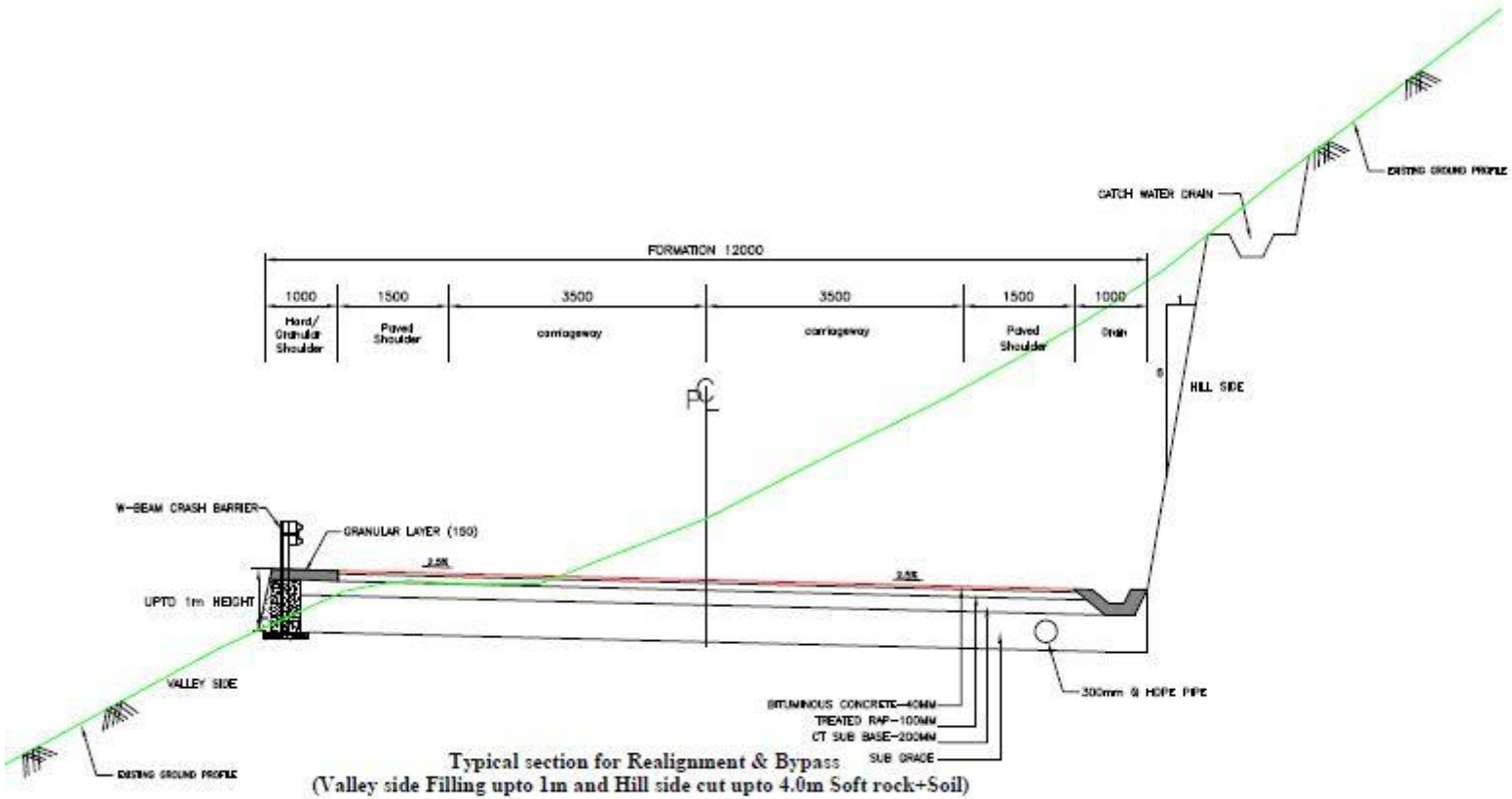
Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side Cut in Hard rock) (TYPE-II)



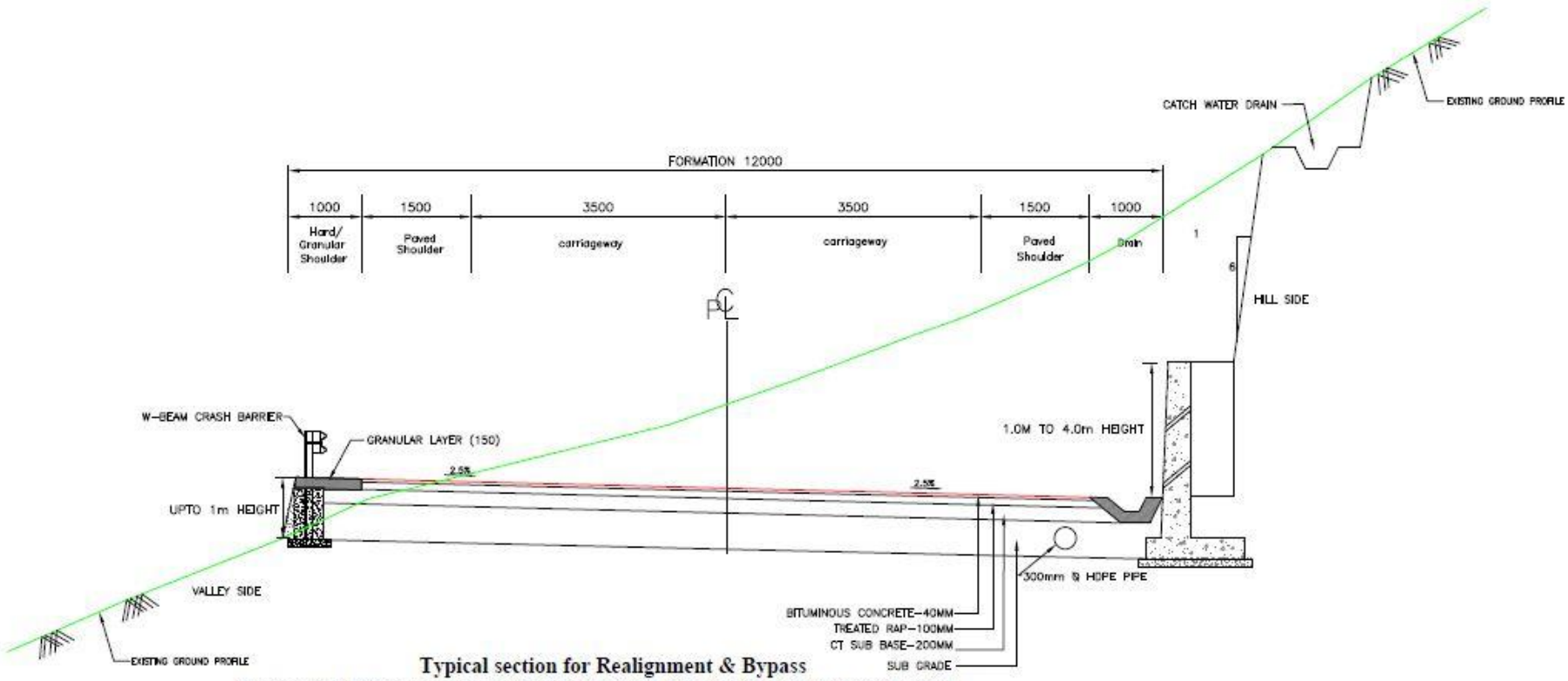
Typical Cross Section for widening of existing road to 2 lane with paved shoulder (Valley side Filling upto 1m and Hill side upto 4.0m Protection Hard rock) (TYPE-II-A)



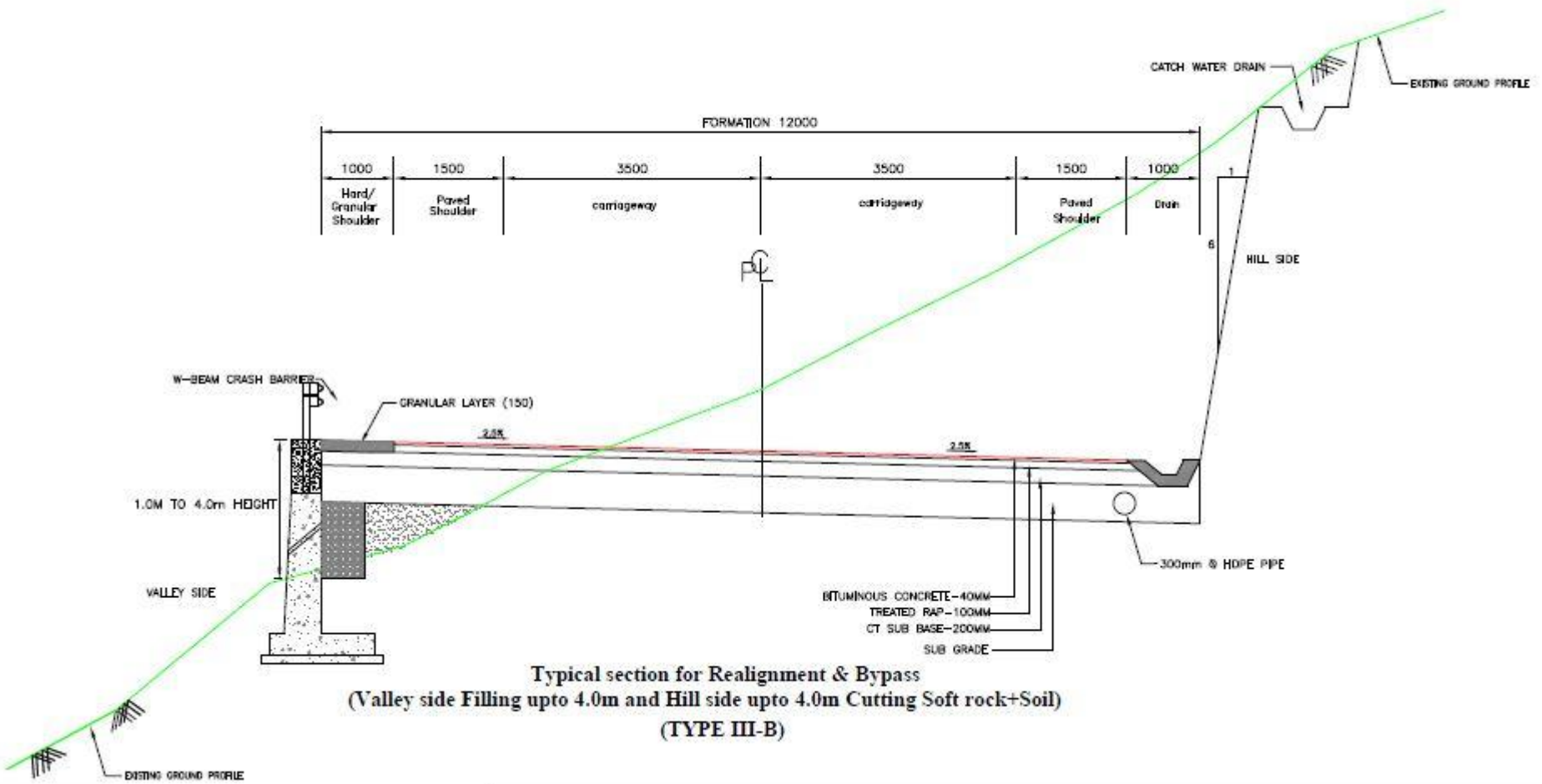
Typical Cross Section for widening of existing road to 2 lane with paved shoulder
(Valley side upto 4.0m Protection and Hill side Cut in Hard rock)
(TYPE-II-B)



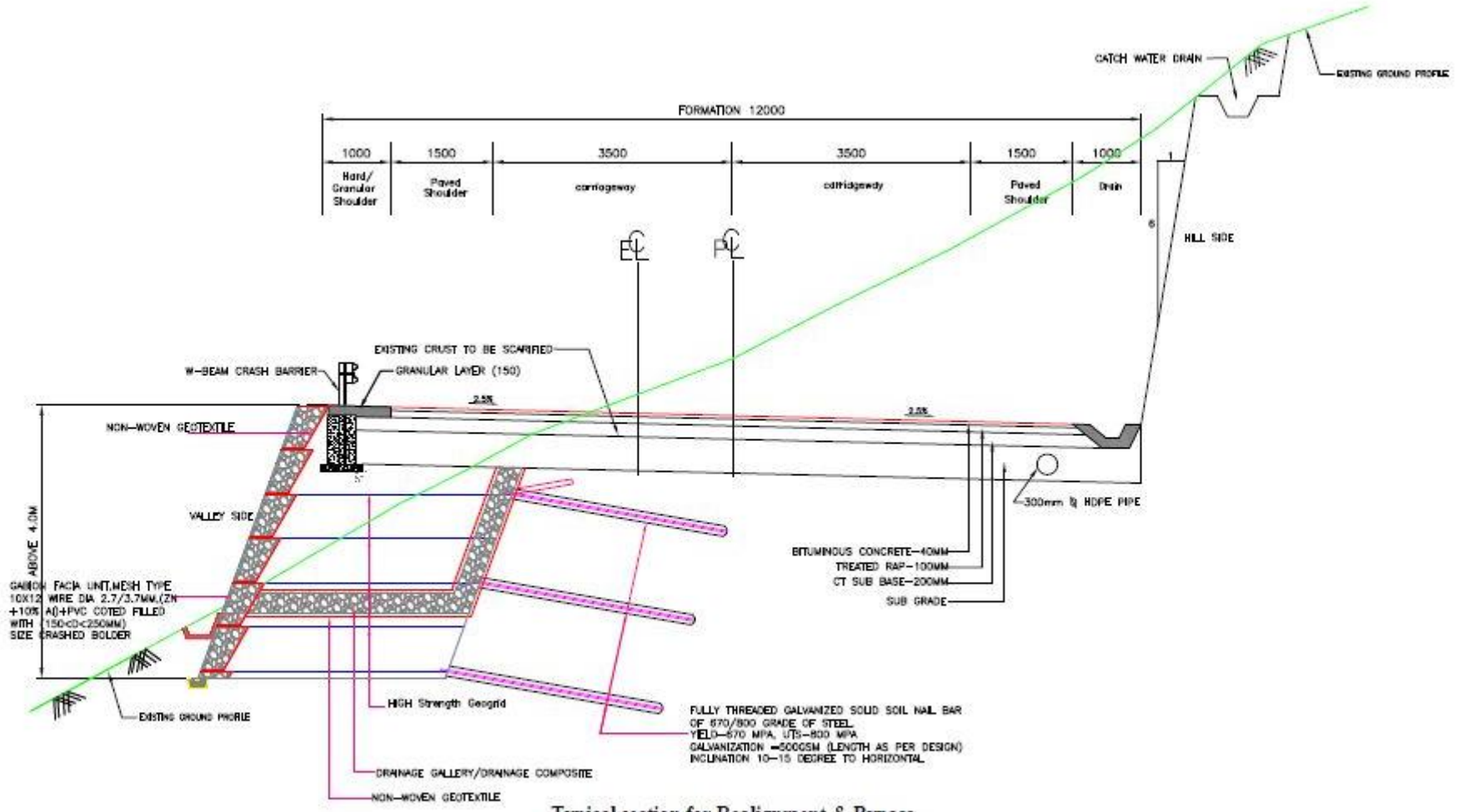
Typical section for Realignment & Bypass
(Valley side Filling upto 1m and Hill side cut upto 4.0m Soft rock+Soil)
(TYPE-III)



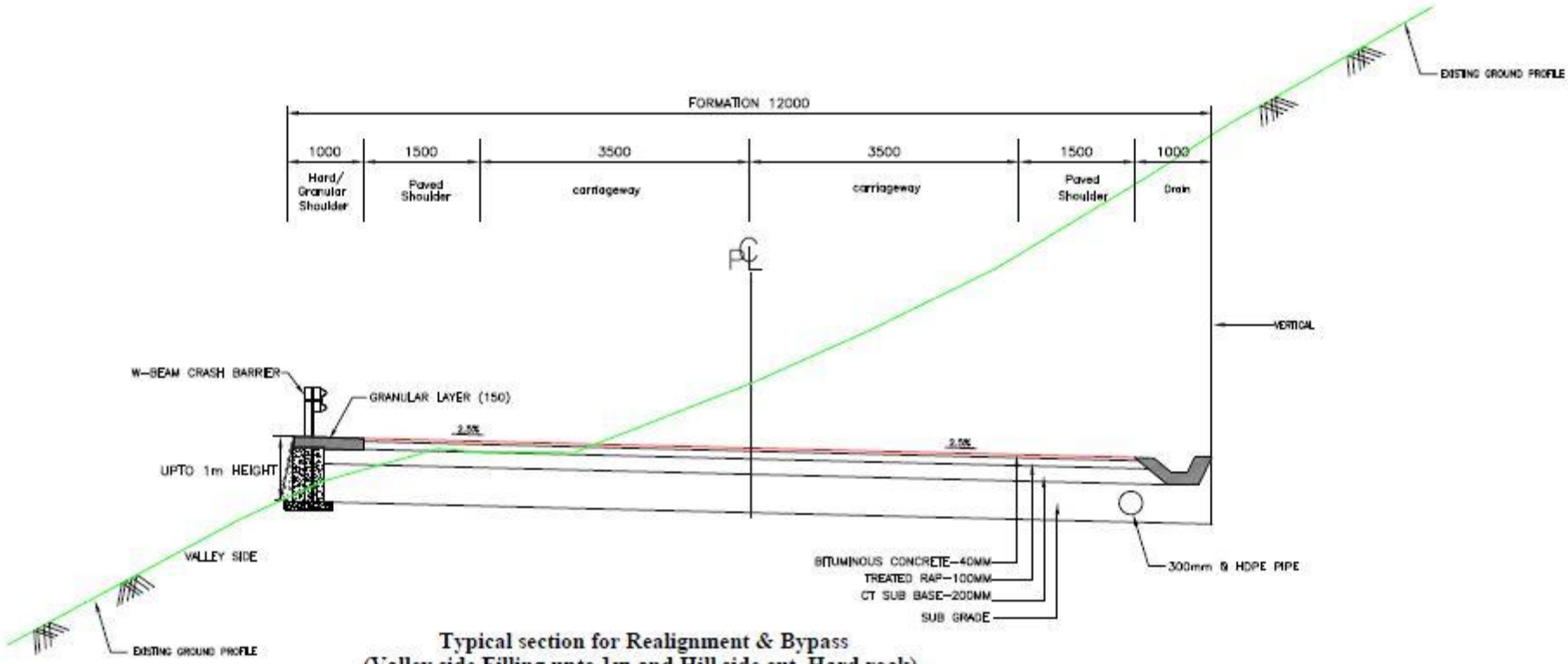
Typical section for Realignment & Bypass
(Valley side Filling upto 1m and Hill side upto 4.0m Protection Soft rock+Soil)
(TYPE-III-A)



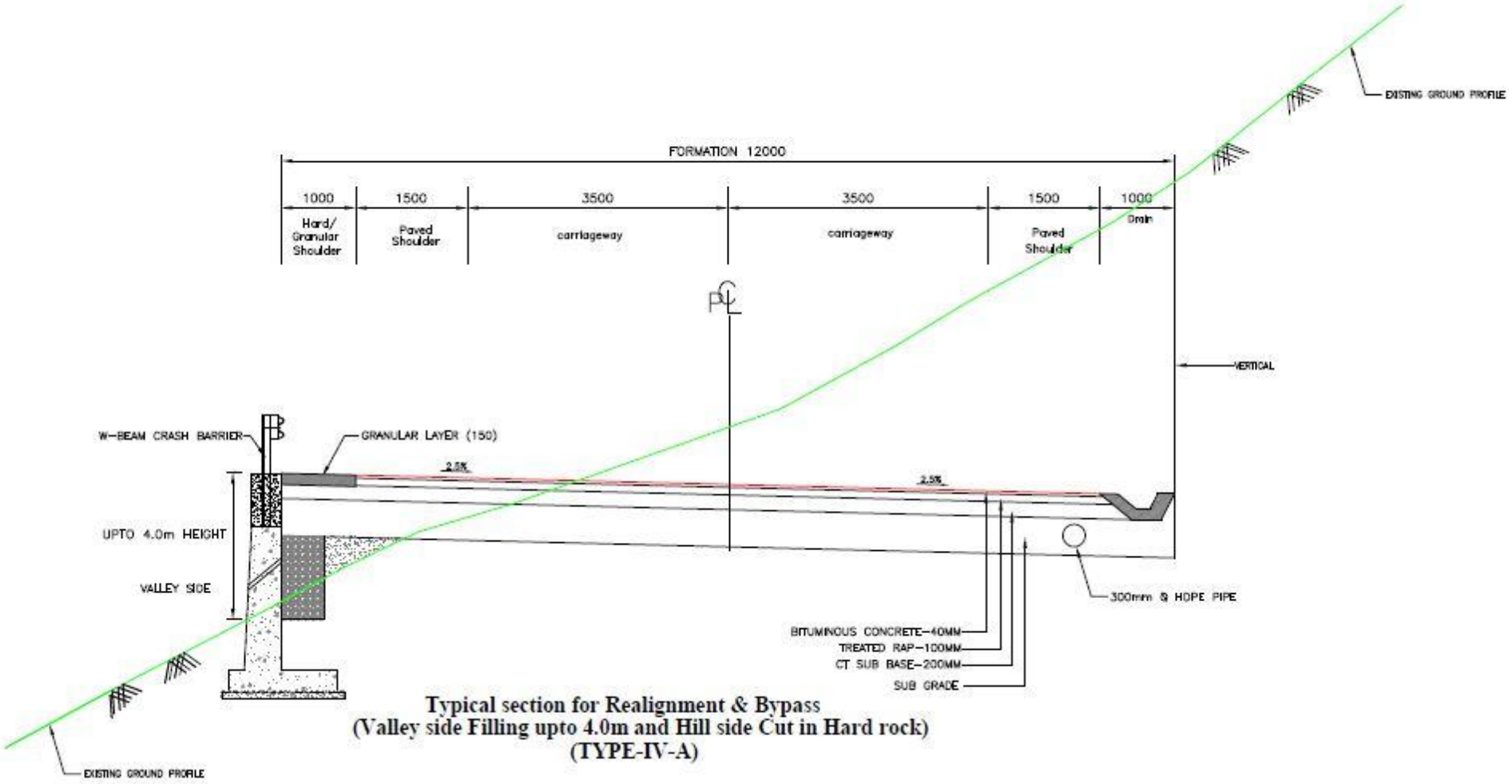
Typical section for Realignment & Bypass
(Valley side Filling upto 4.0m and Hill side upto 4.0m Cutting Soft rock+Soil)
(TYPE III-B)



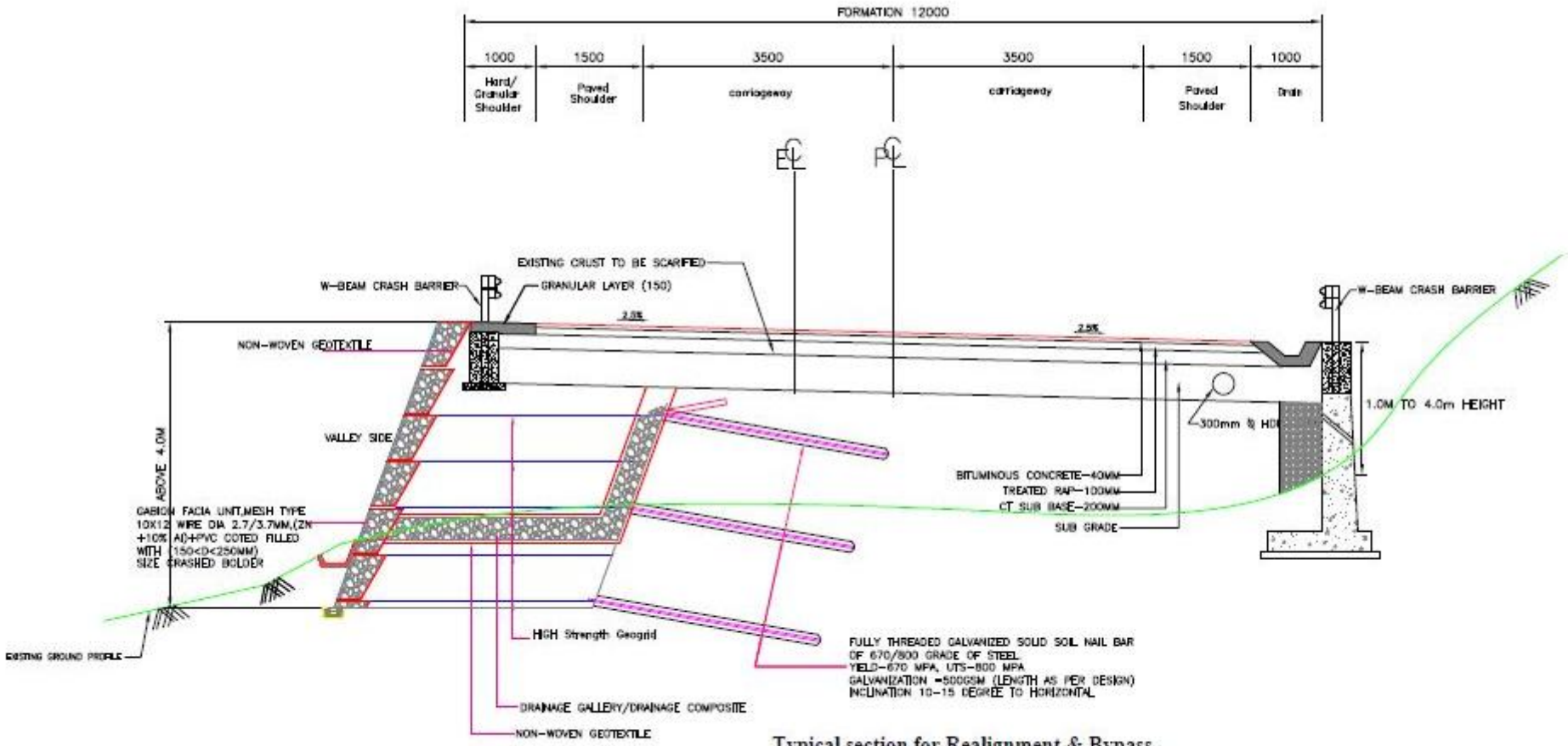
Typical section for Realignment & Bypass
(Valley side Filling >4.0m in soft rock)
(TYPE III-C)



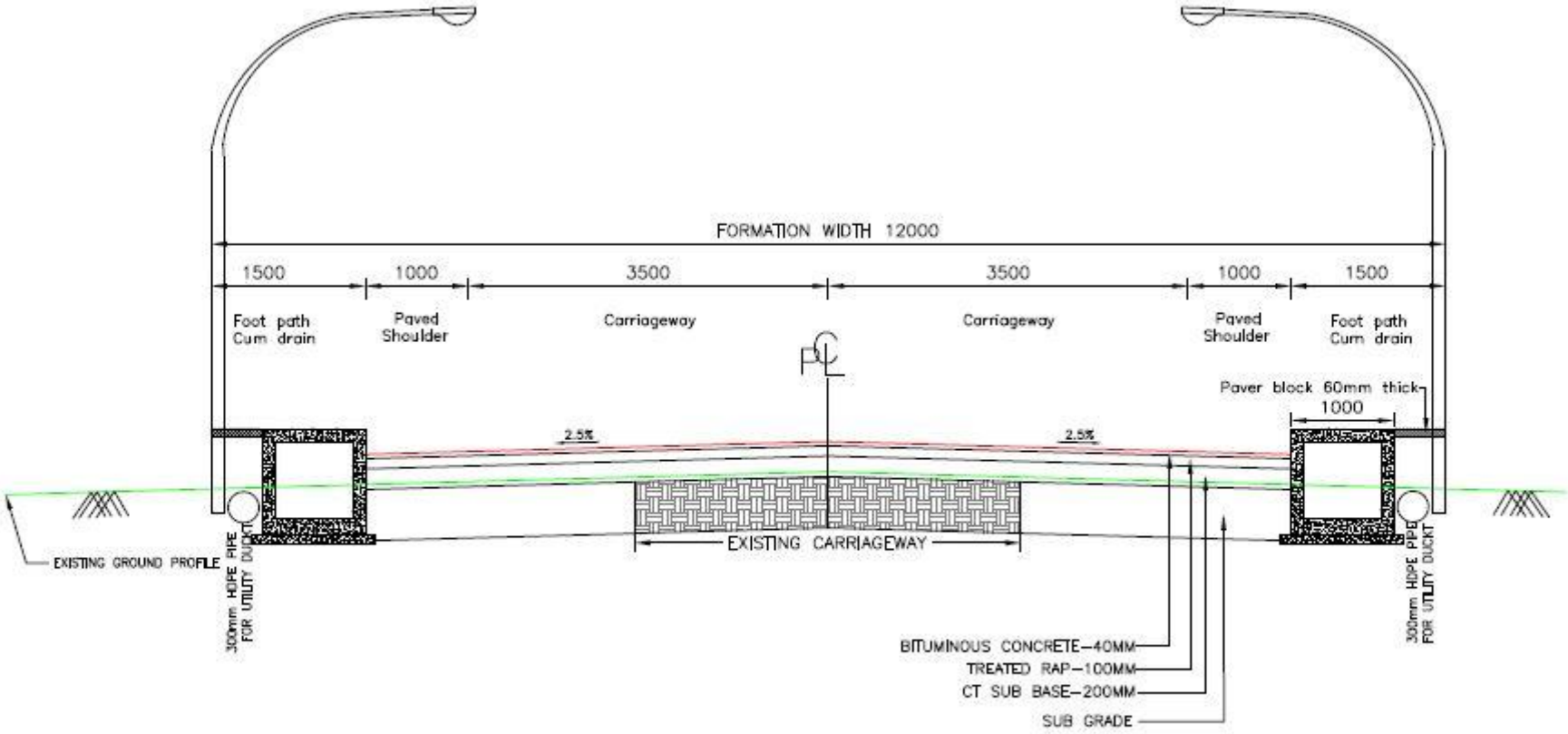
Typical section for Realignment & Bypass
(Valley side Filling upto 1m and Hill side cut Hard rock)
(TYPE-IV)



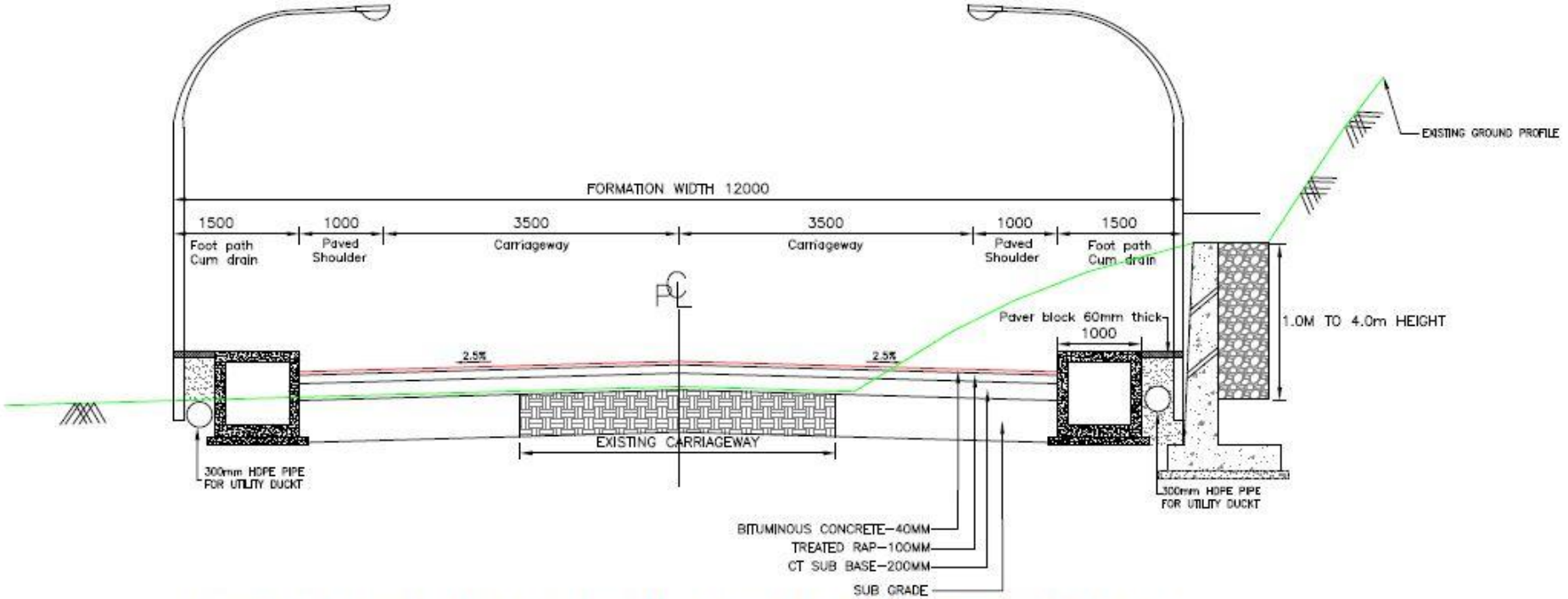
Typical section for Realignment & Bypass
(Valley side Filling upto 4.0m and Hill side Cut in Hard rock)
(TYPE-IV-A)



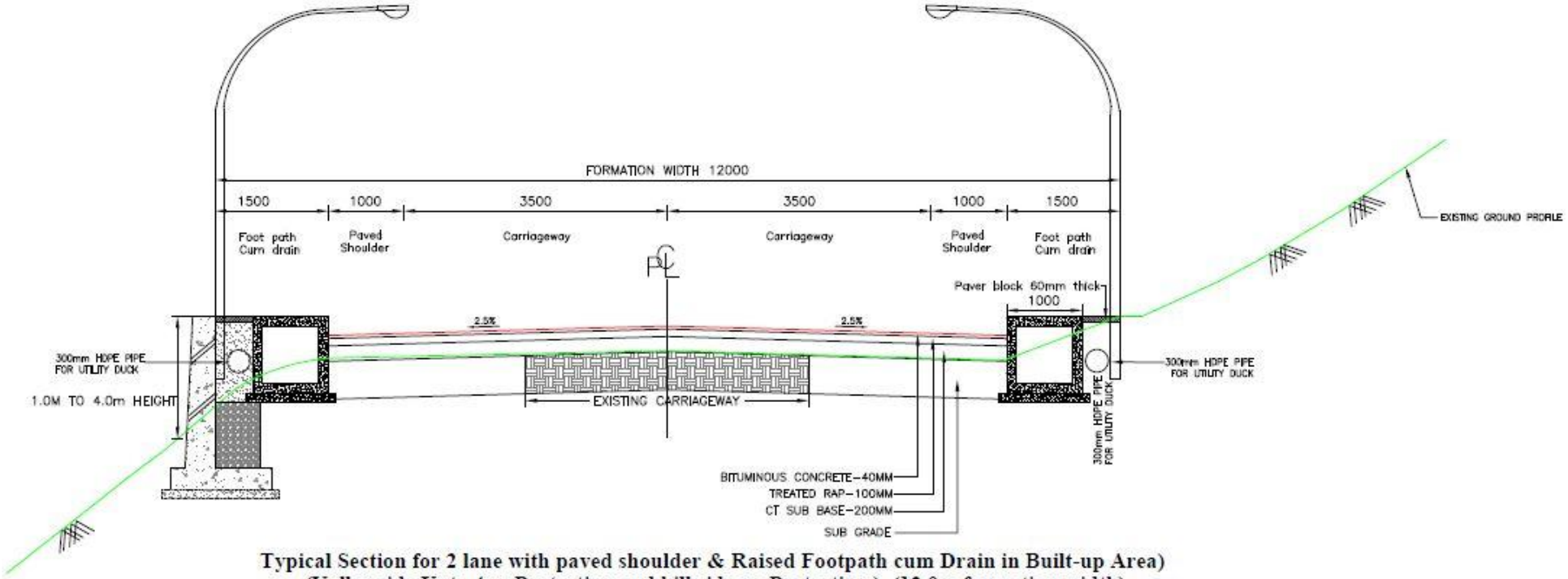
Typical section for Realignment & Bypass
(Both sides protection in Hard rock)
(TYPE-IV-B)



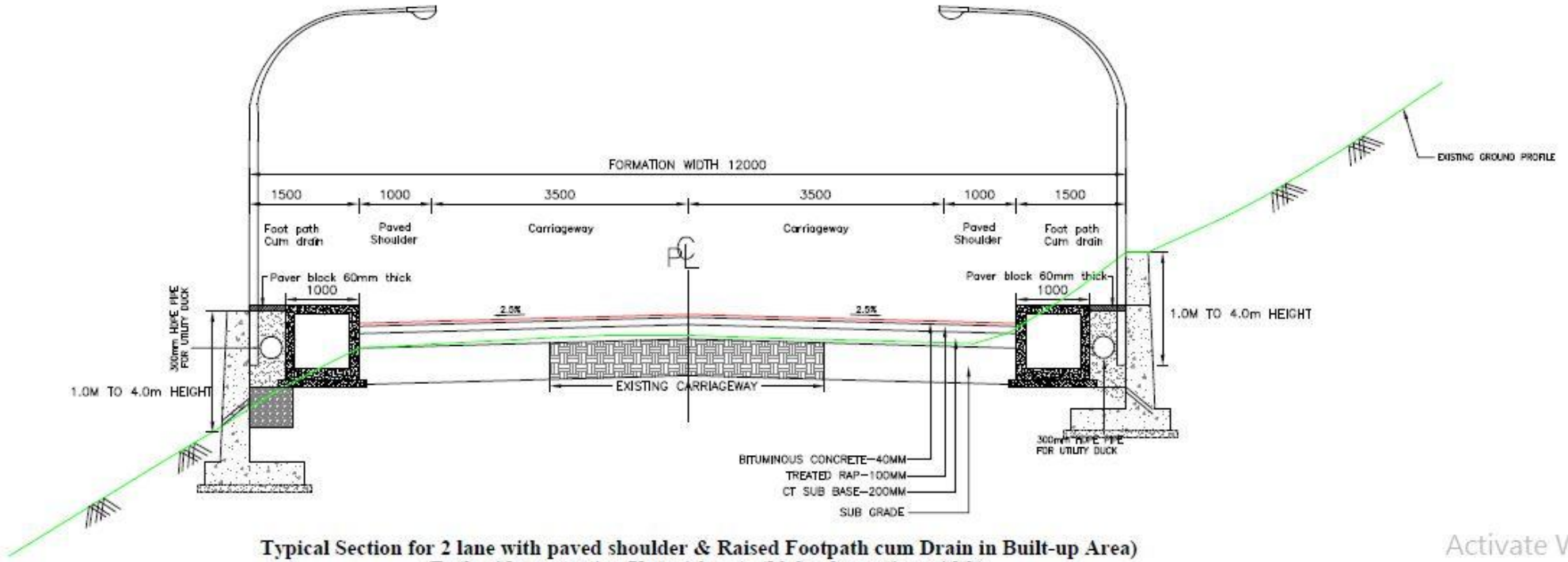
Typical Section for 2 lane with paved shoulder & Raised Footpath cum Drain in Built-up Area)
(12.0m formation width)
(TYPE-V)



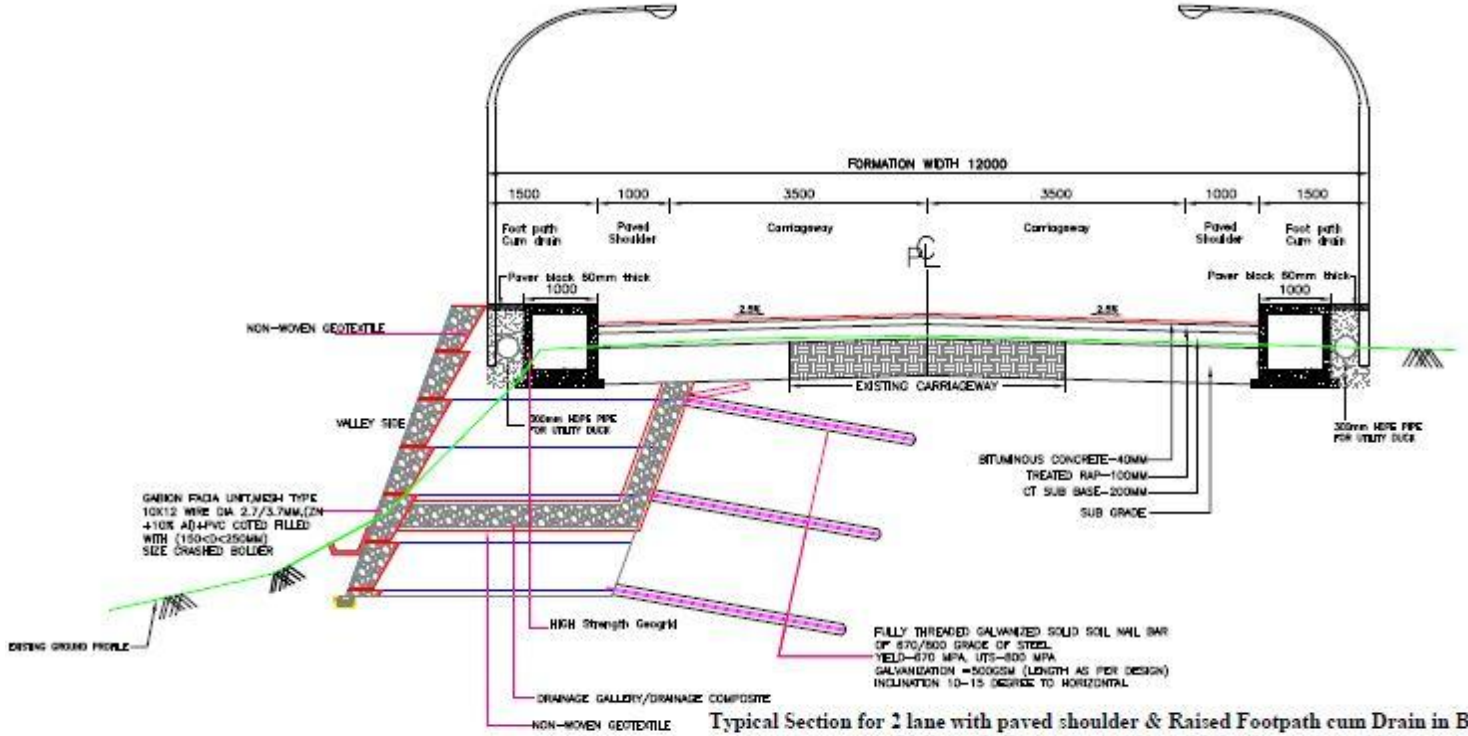
Typical Section for 2 lane with paved shoulder & Raised Footpath cum Drain in Built-up Area)
(Hill side Upto 4 m Protection) (12.0m formation width)
(TYPE-V-A)



Typical Section for 2 lane with paved shoulder & Raised Footpath cum Drain in Built-up Area)
(Valley side Upto 4 m Protection and hill side no Protection) (12.0m formation width)
(TYPE-V-B)



Typical Section for 2 lane with paved shoulder & Raised Footpath cum Drain in Built-up Area)
(Both side protection Upto 4.0 m) (12.0m formation width)
(TYPE-V-C)



Typical Section for 2 lane with paved shoulder & Raised Footpath cum Drain in Built-up Area)
(Valley side Protection >4.0m) (12.0m formation width)
(TYPE-V-D)

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) Roadside furniture;

b) Pedestrian facilities;

c) Bus shelter

d) Bus Bays

e) Truck lay bye

Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

a) Roadside furniture;

The roadside furniture shall include the provision of:

i. **Traffic Signs**:
Traffic signs include roadside signs, overhead signs and kerb-mounted signs along the entire Project Highway as per the manual of specifications.

ii. Pavement Markings:
Pavement markings shall cover road marking as per the manual of specifications.

iii. LED Traffic Blinkers:
LED Traffic Blinkers for the entire project highway at the locations as suggested in Manual.

iv. Delineators
Delineators for the entire Project Highway at the locations as suggested in Manual.

v. **Hectometer / Kilometer stones**
Hectometer/ Kilometer Stones for the entire Project Highway at the locations as suggested in Manual.

vi. Boundary Pillar
Boundary pillar@50m along the alignment of the project road.

b) Pedestrian facilities;

The pedestrian facilities shall be provided as per the Manual.

c) Bus Shelter

The Contractor shall provide additional 14nos. of Bus Shelters along the project highway and the locations are given below. The design of Bus Shelters should be aesthetically pleased with surrounding. The locations of these bus shelters shall be finalized by the Contractor in consultation with Authority's Engineer.

S. No.	Design Chainage (km)	Village	Side
1	369+600	Lameri	Both Side
2	369+850	Tilni	Both Side
3	371+450	Sumerpur	Both Side
4	373+900	Ratura	Both Side
5	376+000	Kalnahodli	Both Side
6	377+400	Sandh	Both Side
7	378+250	Shivanandi	Both Side
8	380+000	Gholteer	Both Side
9	382+350	Nagrasu	Both Side
10	385+000	Kameda	Both Side
11	387+000	Gouchar	Both Side
12	391+700	Dhari nagar	Both Side
13	392+850	Chatvapepal	Both Side
14	398+000	Karanparyag	Both Side

d) Rest Area

The Contractor shall provide 01 nos. of rest area along the project highway.

S. No.	Design Chainage (km)	Village	Side
1	368+850	Lameri	One Side

e) Truck lay bye

The Contractor shall provide 01 nos. of truck lay bye along the project highway.

S. No.	Design Chainage (km)	Village	Side
1	371+075	Tilani	One Side

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:

Manual of Specifications and Standards for Two-Laning of Highways (IRC:SP:73-2015) & Hill road (IRC:SP: 48-1998), referred to herein as the Manual.

{ Note: Specify the relevant Manual, Specifications and Standards}

Annex - I

(Schedule-D)

Specifications and Standards for Construction

1. Specification and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Lanning of Highways (IRC: SP:73-2015), 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 Engineer in charge.

2. Deviations from the Specifications and Standards

2.1. 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.

2.2. 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 forth below:

{ Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements}

SCHEDULE – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

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

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

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

This being not an item rate contract, the procedure for Measurement and Payment for the items of works shall be in accordance with provision of Article 19 of the Agreement. Therefore the Sub Clauses of measurement for payment and rates in above specifications stand deleted.

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

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Nature of Defect or deficiency		Time limit for repair/ rectification
ROADS		
(a)	**Carriageway and paved shoulders**	
(i)	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days
(ii)	Any significant change in roughness value from original value [more than 5%] in a stretch of 1 km (as measured by a Calibrated bump integrator)	120 (one hundred and twenty) days
(iii)	Pot holes	24 hours
(iv)	Any cracks in road surface	15 (fifteen) days
(v)	Any depressions, rutting exceeding 10 mm in road surface	30 (Thirty) days
(vi)	Skidding	7 (seven) days
(vii)	Any other defect/distress on the road	15 (fifteen) days
(viii)	Damage to pavement edges	15 (fifteen) days
(ix)	Removal of debris, dead animals	6 hours
(x)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(b)	**Granular earth shoulders, side slopes, drains and culverts**	
(i)	Edge drop at shoulders exceeding 40 mm	7 (Seven) days

(ii)	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
(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)	De-silting of drains in urban/semi-urban areas	24 hours
(vii)	Railing, parapets, crash barriers	7 (Seven) days (Restore immediately if causing safety hazard)
(viii)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 hours
(ii)	Painting of KM stone, railing, parapets, crash barriers	As and when required/Once every year
(iii)	Danaged/missing roa signs required replacement	7 (Seven) days
(iv)	Damage to road mark ups	7 (Seven) days
(v)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 hours
(ii)	Faults and minor failures	8 hours
(iii)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(e)	**Trees and plantation**	

(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	24 hours
(ii)	Removal of fallen trees from carriageway	4 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
(vi)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(f)	**Other Project Facilities, Rest Area and Approach roads**	
(i)	Damage in pedestrian facilities, truck lay-buys, bus-bays, bus-shelters, cattle, crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Cleaning of toilets	Every 4 hours
(iii)	Defects in electrical, water and sanitary installations	24 hours
(iv)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(v)	Rescue operations and attendance at accidents	Round the clock patrolling Inform police and other agencies immediately Removal of vehicles or debris. Assistance for first-aid and transport of accident victim to hospital Arrangement for safe movement of traffic
(vi)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(vii)	Damaged vehicles or debris on the road	4 (Four) hours

(viii)	Malfunctioning of the mobile cranes	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/scaling Temporary measures Permanent measures	 Within 48 hours Within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Bearings (metallic) of bridges**	
(i)	Deformation	15 (fifteen) days Greasing of metallic bearings once in a year
(c)	**Joints**	
(i)	malfunctioning of joints	15 (fifteen) days
(ii)	Any other defects/deficiency not covered above (a) , (b) &(c) but pointed out by Engineer	3 (Three) days
(d)	**Foundations**	
(i)	Scouring and/or cavitation	15 (fifteen) days
(e)	**Piers, abutments, return walls and wing walls**	
(i)	Cracks and damages including settlement and tilting, Spalling, scaling	30 (thirty) days
(ii)	Any other defects/deficiency not covered above (d) & (e) but pointed out by Engineer	3 (Three) days
(f)	**Other items**	
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets,	3 (three) days

	handrails and crash barriers	(immediately within 24 hours if posing danger of 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 guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(viii)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days

The failure to address above measures for any of the defects/deficiency may attract reduction in payment as per schedule M

Schedule-F

(See Clause 3.1.5(a))

APPLICABLE PERMITS

1. **Applicable Permits**

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

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

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

(c) License for use of explosives;

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

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

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

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

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

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

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

Schedule-G

(See Clause 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

PERFORMANCE SECURITY/Additional Performance Security

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, Sansad Marg,
New Delhi

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called "the Contractor") and [**NHIDCL**], (**"the Authority"**) have entered into an agreement (the **"Agreement"**) for **Construction and Upgradation of existing road to 2-lane with paved shoulder from Km. 368.000 to Km. 399.000 of Lameri to Karanprayag (Excluding Km. 379.100 to Km 380.275) of NH-07 under Chardham Pariyojna on EPC basis in the state of Uttarakhand (Package-I)",** subject to and in accordance with the provisions of the Agreement.

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

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

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

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

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

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

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

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

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

to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

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

8. The Performance Security shall cease to be in force and effect upto 90 (ninety) days after the end of the Defects Liability Period as set forth in Clauses 17.1 of EPC agreement.

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

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

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

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

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi

5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex-II

(Schedule-G)

(See Clause 7.5.3)

Form for Guarantee for Withdrawal of Retention Money

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, Sansad Marg,
New Delhi

WHEREAS:

[Name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [NHIDCL], (hereinafter called "the Authority") for the "**Construction and Upgradation of existing road to 2-lane with paved shoulder from Km. 368.000 to Km. 399.000 of Lameri to Karanprayag (Excluding Km. 379.100 to Km 380.275) of NH-07 under Chardham Pariyojna on EPC basis in the state of Uttarakhand (Package-I)",** subject to and in accordance with the provisions of the Agreement.

a. in accordance with the Clause 7.5.3 of the Agreement, whenever the amount of the retention money (hereinafter called "Retention Money") held by the Authority exceeds 1% (one per cent) of the Contract Price, the Contractor may, at its option, withdraw the Retention Money after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

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

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

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

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

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

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

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

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

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

8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the Defects Liability Period specified in Clauses 17.1 of the Agreement.

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

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

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

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

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex-III

(Schedule-G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, Sansad Marg,
New Delhi

WHEREAS:

(A) [name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [**NHIDCL**], (hereinafter called "**the Authority**") for the **"Construction and Upgradation of existing road to 2-lane with paved shoulder from Km. 368.000 to Km. 399.000 of Lameri to Karanprayag (Excluding Km. 379.100 to Km 380.275) of NH-07 under Chardham Pariyojna on EPC basis in the state of Uttarakhand** subject to and in accordance with the provisions of the Agreement.

(B) in accordance with the Clause 19.2 of the Agreement the Authority shall make to the Contractor advance payment (hereinafter called "Advance Payment") equal to 10% (ten per cent) of the contract price for mobilization expenses and acquisition of equipment; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equal to the amount of each installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement; and the amount of (first/second) installment of the Advance Payment 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:

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

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

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

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

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

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

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

8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the one year from the date of payment of the installment of the Advance Payment, as set forth in Clause 19.2 of the Agreement.

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

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

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

12. Notwithstanding anything contained herein before, our liability under this Bank Guarantee is restricted to Rs._____ (Rs._____ in words) and the bank guarantee shall remain valid till _____. Unless a claim or a demand in writing is served upon us on or before_____ all our liability under this Bank Guarantee shall cease.

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

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062

4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

15.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Schedule-H

(See Clauses 10.1.4 and 19.3)

Contract Price Weightages

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

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	**2**	**3**	**4**
Road works including culverts, widening and repair of culverts	53.61%	**A- Widening and Strengthening of Existing Road**	
		(1) Earthwork up to top of the sub-grade	11.73%
		(2) Treated Sub-Base Course	15.15%
		(3) Treated RAP	16.64%
		(4) Bituminous Base Course	0.00%
		(5) Wearing Coat	11.36%
		(5) Widening and repair of culvert	0.00%
		B.1- Reconstruction/ New 2-lane realignment/bypass (Flexible pavement)	
		(1) Earthwork up to top of the sub-grade	1.18%
		(2) Treated Sub-Base Course	1.02%
		(3) Treated RAP	4.16%
		(4) Bituminous Base Course	0.00%
		(5) Wearing Coat	2.10%
		D-Re-Construction and New culverts on existing road, realignments, bypasses:	
		Culverts (lengths < 6m)	36.66%
Minor Bridges	8.84%	**A.1- Widening and Repair of Minor bridges (length >6 m and < 60 m)**	
		Minor bridges	0.00%
		A.2- New Minor bridges (length >6 m and < 60 m)	

		(1) Foundation + Sub- Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/ pier cap.	72.50%
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion in all respect.	27.50%
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	0.00%
Major Bridge works	0.00%	**A.1- Widening and Repair of Major bridges**	
		Major Bridges	0.00%
		A.2 -New major bridges & Viaduct	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%
		(6) Wing walls/ return walls	0.00%
		(7) Guide Bunds, River Training works etc.	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
Other works	37.55%	(i) Road side drains	21.16%
		(iii) Road signs, markings, km stones, safety devices, (a) Utility Duct (b) W-Beam Crash Barrier (c) Miscellaneous	 21.31% 10.19% 1.52%

		(v) Project facilities (a) Bus Bays and Bus Shelter (b) Truck lay-byes (c) Rest areas (d) Others (e) (junction, Scenic overlook)	 1.07% 0.35% 2.28% 1.87% 0.89%
		(vi) Protection Works other than approaches to the bridges, elevated sections/ flyover/ grade separators and ROBs/ RUBs	
		(a) RCC Retaining Wall/Breast wall (b) Reinforcement Earth Wall	24.02% 15.34%
		(viii) Safety and traffic management during construction	0.00%

- The above list is illustrative and may require modification as per the scope of the work.

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 for Payment	Percentage weightage	Payment Procedure
A- Widening and Strengthening of Existing Road		
(1) Earthwork up to top of the sub-grade	11.73%	Unit of measurement is linear length for two lane. Payment of each stage shall be made on pro rata basis on completion of a stage in length of nor less than 10% of the total length.
(2) Treated Sub-Base Course	15.15%	
(3) Treated RAP	16.64%	
(4) Bituminous Base Course	0.00%	
(5) Wearing Coat	11.36%	
(5) Widening and repair of culvert	0.00%	

B.1- Reconstruction/ New 2-lane realignment/bypass (Flexible pavement)		
(1) Earthwork up to top of the sub-grade	1.18%	Unit of measurement is linear length for two lane. Payment of each stage shall be made on pro rata basis on completion of a stage in length of nor less than 10% of the total length.
(2) Treated Sub-Base Course	1.02%	
(3) Treated RAP	4.16%	
(4) Bituminous Base Course	0.00%	
(5) Wearing Coat	2.10%	
D-Re-construction and New culverts on existing road, realignments, bypasses:		
(1) Culverts (length < 6m)	36.66%	Cost of each culvert shall be determined on pro- rata basis with respect to the total number of culverts. Payment shall be made on the completion of 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 stages shall be worked out accordingly.

Note: The length affected due to law and order problems or litigation during execution due to which the Contractor is unable to execute the work, may be deducted from the total project length for payment purposes. The total length calculated here is only for payment purposes and will not affect and referred in other clauses of the Contract Agreement.

1.3.2 Minor Bridge 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 >6 m and < 60 m)	0.00%	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- <u>New minor bridges</u>		
(1) Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/ pier cap.	72.50%	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 + sub-structure of each bridge subject to completion of at least two foundations along with sub-structure upto 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.
(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion in all respect.	27.50%	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.
(3) Approaches: On completion of approaches including	0.00%	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of

Retaining walls, stone pitching, protection works complete in all respect and fit for use.		approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.

1.3.3 Major Bridge works & Viaducts

Procedure for estimating the value of Major Bridge works & Viaducts shall be as stated in table 1.3.3:

Table 1.3.3

Stage for Payment	**Percentage weightage**	**Payment Procedure**
A.1- Widening and Repair of Major bridges	0.00%	Cost of each major bridge shall be determined on pro rata basis with respect to the total linear length of the major bridges. Payment shall be made on the completion of widening & repair works of a minor bridge.
A.2-<u>New major bridges & Viaduct</u>		
(1) Foundation	0.000%	Cost of each major bridge/ Viaduct shall be determined on pro rata basis with respect to the total linear length (m) of the Major bridge/ Viaduct. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the Major bridge/ Viaduct subject to completion of at least two foundations of the Major bridge/ Viaduct. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure	0.000%	Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of

Stage for Payment	Percentage weightage	Payment Procedure
		sub-structure of the Major bridge/ Viaduct subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the Major bridge/ Viaduct.
(3) Super-structure (including bearings)	0.000%	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints	0.000%	Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.000%	Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/ return walls	0.000%	Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Guide Bunds, River Training works etc.	0.000%	Payment shall be made on completion of all Guide Bunds/River Training works etc. complete in all respects as specified.
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.000%	Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respect as specified.

1.3.4 Other works.

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

Table 1.3.4

Stage for Payment	Percentage weightage	Payment Procedure
(i) Road side drains	21.16%	Unit of measurement is linear length in km. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(ii) Road signs, markings, km stones, safety devices, (a) Utility Duct (b) W-Beam Crash Barrier (c) Miscellaneous	21.31% 10.19% 1.52%	
(v) Project facilities (i) Bus byes and Bus Shelter (ii) Truck lay bye (iii) Rest areas	1.07% 0.35% 2.28%	Payment shall be made on pro-rata basis for completed facilities.
(iv) Others (junction, Scenic overlook)	1.87% 0.89%	
(vi) Protection Works other than approaches to the bridges, elevated sections/ flyover/ grade separators and ROBs/ RUBs (i) RCC Retaining Wall/Breast Wall (ii) RE Wall	24.02% 15.34%	Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(v) Safety and traffic management during construction	0.000%	Payment shall be made on pro rata basis every six months.

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)

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

Alignment Plan and longitudinal Section are enclosed in digital form in CD marked as Annex-I

[Note: The Authority shall describe in this Annex-I, all the Drawings that the Contractor is required to furnish under Clause 10.2.]

- Horizontal and Vertical Alignment (with plan & profile) with details of reference pillars. Horizontal Intersection Point, Vertical Intersection Points, elements of curves, and sight distances.
- Typical Cross-section with details of pavement structures.
- Detailed drawings of individual Bridges/Structures/ROB.
- Detailed drawing for individual culverts.
- Detailed drawings of guide bunds and protection works and retaining structures.
- Detailed drawings of Drainage including Masonry drains and other drains.

SCHEDULE-J

(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

1. Project Completion Schedule

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

2. Project Milestone-I

2.1 Project Milestone-I shall occur on the date falling on the 180th (One hundred & Eighty) day from the Appointed Date (the "**Project Milestone-I"**).

2.2 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 completion schedule in reference to Schedule-H Items, Stages and Sub-stages payment statements for an amount not less than 10% (ten per cent) of the Contract Price.

3. Project Milestone-II

3.1 Project Milestone-II shall occur on the date falling on the 420th (Four hundred & twentieth) day from the Appointment Date (the **"Project Milestone-II**").

Prior to the occurrence of Project Milestone-II, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements completion schedule in reference to Schedule-H Items, Stages and Sub-stages payment statements for an amount not less than 40% (forty per cent) of the Contract Price.

4. Project Milestone-III

4.1 Project Milestone-III shall occur on the date falling on the 660th (six hundred sixty) day from the Appointed Date (the "**Project Milestone-III"**).

4.2 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 payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price.

5 Schedule Completion Date

5.1 The Schedule Completion Date shall occur on the 912th (Nine hundred and twelve) day from the Appointed Date.

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

6 Extension of time

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

SCHEDULE-K

(See Clause 12.1.2)

Tests on Completion

1. Schedule for Tests

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

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

2 Tests

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

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

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

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

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

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

3 Agency for conducting Tests

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

4. Completion Certificate

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

SCHEDULE-L

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

1. I, …….. (Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated …….. (the "**Agreement**"), for construction of the **"Construction and Upgradation of existing road to 2-lane with paved shoulder from Km. 368.000 to Km. 399.000 of Lameri to Karanprayag (Excluding Km. 379.100 to Km 380.275) of NH-07 under Chardham Pariyojna on EPC basis in the state of Uttarakhand."** through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

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

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

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

COMPLETION CERTIFICATE

1. I, …….. (Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated …….. (the "**Agreement**"), for construction of the **"Construction and Upgradation of existing road to 2-lane with paved shoulder from Km. 368.000 to Km. 399.000 of Lameri to Karanprayag (Excluding Km. 379.100 to Km 380.275) of NH-07 under Chardham Pariyojna on EPC basis in the state of Uttarakhand."** through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safety and reliably placed in service of the Users thereof..

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

SIGNED, SEALED AND DELIVERED

For and on behalf of

Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE-M

(See Clauses 14.6., 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

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

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

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

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

2. Percentage reductions in lump sum payments

2.1 The following percentages shall govern the payment reduction:

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

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

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

R=P/100 * M * L1/L

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

SCHEDULE-N

(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

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

1.2 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 this Schedule-N.

2 Terms of Reference

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

3 Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1. Scope

1.1 These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the Ministry of Road Transport and Highways (the "**Authority**") and ..... (the "**Contractor**") for **"Construction and Upgradation of existing road to 2-lane with paved shoulder from Km. 368.000 to Km. 399.000 of Lameri to Karanprayag (Excluding Km. 379.100 to Km 380.275) of NH-07 under Chardham Pariyojna on EPC basis in the state of Uttarakhand"** and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

2. Definitions and interpretation

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

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

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

3. General

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

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

(a) Any Time extension;

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

(c) The Termination Payment; or

(d) Any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

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

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

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

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

4 Construction Period

4.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and

the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5. Maintenance Period

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

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

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

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

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

6 Determination of costs and time

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

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

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

7. Payments

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

7.2 Authority's Engineer shall -

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

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

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

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

8. Other duties and functions

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

9 Miscellaneous

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

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

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

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

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

SCHEDULE - O

(See Clauses 19.4.1, 19.6.1, and 19.8.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

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

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

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

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

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

(f) Deductions:

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

  (ii) Any amount towards deduction of taxes; and

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

(g) Net claim: (e) – (f) (iii);

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

  (i) For the Works executed (excluding Change of Scope orders);
  (ii) For Change of Scope Orders, and
  (iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

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

SCHEDULE-P

(See Clause 20.1)

INSURANCE

1. Insurance during Construction Period

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

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

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

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

2. Insurance for Contractor's Defects Liability

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

3. Insurance against injury to persons and damage to property

3.1. The Contractor shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph l 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 and occurring before the issue of the Performance Certificate. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be as per the applicable laws of government and procedure in vogue.

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

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

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

4. Insurance to be in joint names

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