

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

ORIGINAL APPLICATION NO. 620/2024

IN THE MATTER OF:

Bashir Ahmed Bhat & Ors.

.... Applicants

Versus

National Highways Authority of India & Ors.

.... Respondents

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NDOH- 11.09.2024

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RESPONDENT NO.1

THROUGH

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BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO. 620/2024

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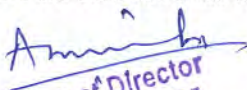
National Highways Authority of India & Ors.

.... Respondents

**REPLY ON BEHALF OF RESPONDENT NO.1/NHAI TO THE
APPLICATION UNDER SECTION 15 READ WITH SECTION 20 OF
THE NATIONAL GREEN TRIBUNAL ACT, 2010**

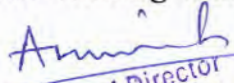
MOST RESPECTFULLY SHOWETH:

1. That the present reply is being filed by the Answering Respondent No.1/NHAI in compliance with the Order dated 27.05.2024 passed by this Hon'ble Tribunal to the Original application, wherein the Applicants have alleged that due to construction of Srinagar Ring Road in the Union Territory of Jammu, environmental damage has occurred in the form of dust pollution and water logging which has affected the Apple Orchards of the Applicants at Village Wathoor, as well as other villages in District Budgam in Jammu & Kashmir.
2. At the outset, the Answering Respondent denies the allegations made by the Applicants in the present application as wholly false and misconceived. The answering Respondent is not responsible in any manner for the damage caused to the apple orchards of the Applicants as alleged herein nor is responsible for causing environmental damages. The various allegations raised against the Answering Respondent is also denied as false and irrelevant as detailed in the following paras.


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PRELIMINARY SUBMISSIONS

3. The first contention raised by the Applicants is that the orchards/agriculture fields (approx. three acres) of the Applicants have been damaged due to water logging as the water channel has been blocked in the process of construction of road. It is submitted that the water logging and flooding of the apple orchards has not occurred due to the construction of Srinagar Ring Road, as alleged by the Applicants. On the contrary, the Applicants have not disclosed that there was heavy rainfall in the valley in the month of April due to which the water level had raised upto the danger mark. The said situation was also reported in local newspaper dated April 29, 2024, true copy of which is annexed herewith and marked as **Annexure R-1/1**. Because of the heavy rainfall, there was flood like situations due to which the water from the flood channels had seeped to the residential areas leading to landslides and damage to the private properties. Moreover due to landslides, there was damage to several structures in District Budgam with a portion of an interior road, along with two boundary walls being washed away. True copy of newspaper report dated 01.05.2024 is annexed herewith and marked as **Annexure R-1/2**. In this regard, the District Administration had also issued various advisories to alert the residents of the valley regarding the inclement weather and Heavy Rainfall forecast by the India Metrological Department.
4. It is submitted that even the construction of the project was adversely affected due to the severe weather conditions in the valley. In fact, the EPC Contractor – NKC Projects Pvt Ltd issued notice of Force Majeure Non-Political Event as per Contract Agreement, to the Answering Respondent due to hampering of work because of unseasonal heavy rainfall and closure of the existing Jammu-Srinagar National Highway.


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True copy of the letter dated 30.04.2024 alongwith enclosures detailing the rainfall data, newspaper cutting and various advisories issued by the District Administration regarding the heavy rainfall forecast by the Indian Metrological Department, are annexed herewith and marked as **Annexure R/1-3 (Colly)**.

5. It is pertinent to mention that in view of the construction of Srinagar Ring Road being a green field project, the Answering Respondent had adopted sufficient provisions for the cross-water drainage throughout the alignment of Ring Road. The details of structures and their status within 01 Km radius from the Applicant's land is mentioned below-

S.No.	Type of Structure	Chainage	Status
1.	Minor Bridge	9+407	Completed
2.	Minor Bridge	9+521	Completed
3.	Minor Bridge	9+604	Completed
4.	LVUP(Light Vehicular Underpass)	9+900	Completed
5.	Minor Bridge	10+100	Completed
6.	Minor Bridge	10+685	Super Structure in progress
7.	LVUP(Light Vehicular Underpass)	11+025	Completed

True copies of the photographs showing the structures are attached herewith and marked as **Annexure R-1/4 (Colly)**.

Hence, the Applicants have deliberately not disclosed the ground reality that there was flood like situations in the whole State of J&K which adversely affected the entire valley. Even otherwise there is no major damage caused to the Applicants as evident from the photographs taken

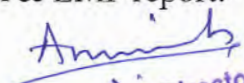
Annexure
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in July 2024 of their land post heavy rainfall compared with the photographs of their land during the heavy rainfall period as annexed by them. True copies of the photographs for the month of July, 2024 are attached herewith and marked as **Annexure R-1/5 (Colly)**. It is clear from the photographs that the damage, if any, to the Applicants' property is not due to the construction of Srinagar Ring Road as alleged but was due to natural calamity.

6. The second contention of the Applicants is that the Environment Impact Assessment (EIA) and Environmental Mitigation Plan (EMP) study which was done by the Answering Respondent through its consultant Louis Berger Consulting Pvt Ltd, is superficial and deficient. The said allegation is denied by the Answering Respondent as wholly bald and devoid of any substantiation. It is submitted that the study for EIA and EMP was duly carried out and the final report was submitted in July 2016 as per the Terms of Reference (TOR) granted by MoEF&CC. The compliance of TOR conditions are addressed in different chapters of EIA & EMP, and their references are provided in the remark column, which is annexed as Appendix-1 of EIA & EMP report. True copy of Appendix-1 of EIA & EMP report is annexed and marked as **Annexure R-1/6**.


The various issues are dealt under different chapters as detailed below-

- the issue of air pollution control in TOR is given under Sr. No. XXVIII as detailed in Chapter-3 of EIA report and Sr. Nos. XXX, XXXI and XXXII as detailed in Chapter-4 of EIA report.
- Drainage & flood control are given under Sr. Nos. XXXVI and XXXVII as detailed in Chapters 4 and 10 of EIA report and Sr. No. Iiii as detailed in Appendix 2.1.
- The detailed mitigation measures for air pollution control and drainage & flood control are given in Chapter-4, Chapter-9 and Chapter-10 of the EIA & EMP report.


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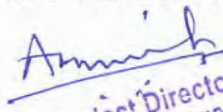
It is pertinent to mention that a detailed Environmental Management Plan (EMP) is included in Chapter 10 of the EIA & EMP report, outlining the environmental mitigation strategies for the pre-construction, construction, and operational phases of the project. These strategies address the air and water pollution control, noise reduction, waste management, ecological conservation, and social impact mitigation. The Environmental budget for various Environmental Management measures are also provided in the EIA & EMP report. True copies of Chapter 4, 9 and 10 of the EIA & EMP report are annexed and marked as **Annexure R-1/7 (Colly)**.

7. The third contention of the Applicants is that it is entitled to compensation as per Section 17 of the NGT Act, 2010, in view of the violation by the Answering Respondent to get a proper EIA done as per Section 3(2)(v) of the Environment Protection Act, 1986 read with Rule 5(3)(d) of the Environment Protection Rules, 1986. It is reiterated that there is no violation by the answering respondent to get EIA done as falsely averred by the Applicants and hence, no relief as prayed is liable to be granted to the Applicants. Contents of the preceding para is relied upon in this regard. Moreover, the relief is granted by the Hon'ble Tribunal under Section 17 of the NGT Act, 2010 only in applicable cases as stated in the section on an equitable basis. The said section does not apply in the present case since the Answering Respondent has not acted in any manner whatsoever because of which the Applicants' property has been damaged. It is reiterated that the damage to the Applicants' property (if any) is due to unprecedented heavy rainfalls and not due to the construction activities of the Ring Road project, as is being alleged. It is pertinent to mention that the Answering Respondent has already awarded due compensation towards acquisition of land admeasuring 8 Kanal 7 marla 108 Sq.Ft & 3 Kanal 7 marla 163 Sq.Ft amounting to


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Rs.5,13,46,656/- (Survey Nos.1569 & 1580), and Rs.12,35,736/- towards cutting of trees coming under the alignment (245 Nos.) as per J&K Land Acquisition Act, Samvat 1990. Thus, the relief of compensation as sought by the Applicants is liable to be rejected since there is no fault of the Answering Respondent or the EPC Contractor for not complying with the environment norms.

8. The fourth contention of the Applicant is that it is entitled to compensation as per the Polluter Pays Principle which forms part of the NGT Act, 2010 as stipulated under Section 20 of the Act. The said principle is not applicable in this case as there was no violation under the Environment Protection Act, 1986 read with Environment Protection Rules, 1986. It is submitted that it is well settled law as laid down by the Hon'ble Supreme Court in the case of *Vellore Citizens' Welfare Forum v. Union of India*, (1996) 5 SCC 647, that the Polluter Pays Principle is applicable when the activity carried on by a person is hazardous/ inherently dangerous and the person carrying on such activity is liable to make good the loss caused to any other person by his activity irrespective of the fact whether he took reasonable care while carrying on his activity. Thus, the absolute liability for harm to the environment extends not only to compensate the victim of pollution but also the cost of restoring the environmental degradation. The rule is premised upon the very nature of the activity being carried on. In the present case, the construction of the Srinagar Ring Road by the Respondent cannot be said to be hazardous or inherently dangerous as the said project has commenced on 06.08.2021 after the study for EIA and EMP was duly carried out and the final report was submitted in July 2016 as per the Terms of Reference (TOR) granted by MoEF&CC. The compliance of TOR conditions are addressed in different chapters of EIA & EMP. Hence as already stated above, the apple orchards of the Applicants was affected by the heavy rainfall and


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that the answering Respondent is not liable to pay any compensation to the Applicants based on the Polluter Pays Principle.

PARAWISE REPLY

- I-II. Contents of paras I-II being matter of record needs no reply.
- III. Contents of para III which are matter of record needs no reply. The remaining averments are denied as false and untenable. It is denied that there is issue of environmental damage in the form of dust pollution and water logging which has led to flooding of the orchards of the Applicants. It is further denied that the environmental damage has occurred due to the construction of Srinagar Ring Road as alleged by the Applicants. It is reiterated that the Applicants have deliberately not disclosed the fact that there was heavy rainfall in the valley in the month of April due to which the water level had raised upto the danger mark. Even the District Administration had issued various advisories to alert the residents of the valley regarding the inclement weather and Heavy Rainfall forecast by the India Metrological Department. It is also denied that EIA and EMP study which was done by the Answering Respondent through its Consultant Louis Berger Consulting Pvt Ltd is superficial and deficient in taking care of the actual impact on the environment in the present case. The said allegation is strongly denied by the Answering Respondent as wholly bald and devoid of any substantiation. It is reiterated that Answering Respondent has got the study for EIA and EMP duly carried out through its consultant pursuant to which the final report was submitted in July 2016 as per the Terms of Reference (TOR) granted by MoEF&CC. Contents of the preliminary submissions are relied upon and not repeated for the sake of brevity.

ARRAY OF PARTIES

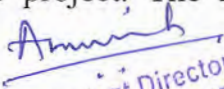

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- 1-2. Contents of paras 1-2 are matter of record, hence needs no reply.

FACTS LEADING TO THE FILING OF PRESENT APPLICATION

- 3-8. Contents of paras 3-8 which are matter of record needs no reply. The remaining averments are denied as false, bald and misconceived and being repetitive contents of the preliminary submissions are relied upon and not repeated for the sake of brevity. It is reiterated that the present application is liable to be rejected as it is based on wholly presumptuous grounds and lacks substantiation in respect of the various allegation raised by the Applicants against the Answering Respondent. It is reiterated that the Applicants have suppressed the fact that in April, 2024, there was unprecedented rainfall in the valley as also evident from the various advisories issued by the District Administration in various districts namely Anantnag, Ganderbal, Srinagar etc. The allegation that the property of the Applicants got impacted because of the construction of Srinagar Ring Road is wholly false and bereft of any merit. Even the allegation regarding the deficient study of EIA and EMP by the Answering Respondent is denied as bald and presumptuous. The Applicants have merely made allegation in respect of the project without disclosing the deficiency and the basis for making such an allegation. Merely the flooding of the property of the Applicants does not prove the deficiency of the EIA and EMP conducted by the Answering Respondent which was duly carried out and the final report was submitted in July 2016 as per the Terms of Reference (TOR) granted by MoEF&CC after conducting detailed study and compliance of the TOR.

It is denied that the widespread dust pollution and water logging as evident from the various photographs annexed in the application is due to the construction activities of the project. The reliance placed by the

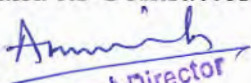

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Applicants on the various photographs is also false as the fact that no damage is caused to the apple orchards is evident from a perusal of the photographs annexed by the Answering Respondent of the apple orchards which were taken post heavy rainfall period in July, 2024. Regarding the dust pollution, it is reiterated that the Answering Respondent is taking all measures as evident from the photographs of the project, which are annexed herewith and marked as **Annexure R-1/8 (Colly)**.

The reliance placed by the Applicants on the letter dated 19.04.2024 sent to the Answering Respondent is denied as the said letter was never received in the office of the Answering Respondent either through courier or email. Notwithstanding the above, the contents of the letter are well taken care of and necessary compliances are being done by the Answering Respondent in the construction of the Srinagar Ring Road Project. It is stated that in order to serve the purpose of the Ring Road, the project facilities (Configuration of the Road) should be completed in all respects.

Regarding the allegations made against the Contractor, the same is denied for want of knowledge. It is also denied that the construction activities of the project have generated excessive dust due to which the adjoining lands are facing severe environmental consequences. The said allegations are wholly presumptuous and devoid of any merit.

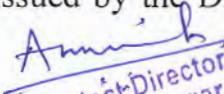
9-12. Contents of paras 9-12 which are matter of record needs no reply. The remaining averments are denied as false, bald and misconceived and being repetitive, contents of the preliminary submissions are relied upon. It is denied that there was any violation of Section 3(2)(v) of the Environment Protection Act, 1986 read with Rule 5(3)(d) of the Environment Protection Rules, 1986. It is further denied that this is a clear cut case of liability of NHAI and its Contractor to pay compensation


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to the Applicants and other local persons affected for damage to their orchards on the basis of principles of No Fault Liability as per Section 17 of the NGT Act. It is further denied that NHAI and its Contractor are duty bound for restoration and restitution of the orchards/agricultural field of the Applicants to its original state and pay compensation. It is reiterated as stated in the preceding paras above that the damage to the Applicants' property, if any, was due to the heavy rainfalls and not due to the construction activities of the Ring Road project. Thus, the purported damage is not due to the fault of NHAI or Contractor, and that there is no responsibility of NHAI or Contractor to restore & restitution of the Applicants' property.

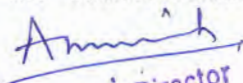
PARAWISE REPLY TO GROUNDS

13. Contents of para 13 are denied as false, misconceived and untenable. The present application is liable to be rejected as no valid ground exists for seeking any relief from the Hon'ble Tribunal.
- A-E. Contents of Grounds A-E are denied as false, misconceived and untenable. It is denied that the environmental damage to the yield of apple orchards have occurred due to the construction of Srinagar Ring Road passing through District Budgam leading to dust pollution and water logging. It is reiterated that the water logging and flooding of the apple orchards has not occurred due to the construction of Srinagar Ring Road as alleged by the Applicants. The Applicants have suppressed the fact that there was heavy rainfall in the valley in the month of April due to which the water level had raised upto the danger mark. Because of the heavy rainfall, there was flood like situations due to which the water from the flood channels had seeped to the residential areas leading to landslides and damage to the private properties. Reliance is placed on the newspaper reports and advisory issued by the District Administration to


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alert the residents of the valley regarding the inclement weather and Heavy Rainfall forecast by the India Metrological Department. In fact, the construction of the project was also adversely affected due to the severe weather conditions in the valley. Hence, the EPC Contractor had issued notice of Force Majeure Non-Political Event as per CA to the Answering Respondent due to stoppage of work. The severe weather condition stands substantiated from the newspaper cuttings and various advisories issued by the District Administration regarding the heavy rainfall forecast by the Indian Metrological Department. Regarding the dust pollution, the Answering Respondent is taking all measures as evident from the photographs of the project (Annexure R-1/8 (Colly)).

- F-I. Contents of Grounds F-I are denied as false, misconceived and untenable. It is denied that the Environment Impact Assessment (EIA) and Environmental Mitigation Plan (EMP) study which was done by the Answering Respondent through its consultant Louis Berger Consulting Pvt Ltd, is superficial and deficient. The said allegation is denied by the Answering Respondent as wholly bald and devoid of any substantiation, as the Applicants have not disclosed the basis for making this allegation. It is reiterated that the study for EIA and EMP was duly carried out and the final report was submitted in July 2016 as per the Terms of Reference (TOR) granted by MoEF&CC. Consequently, neither the Answering Respondent nor the EPC Contractor have any liability to pay compensation to the Applicants and other local persons whose lands are affected, as per Section 17 of the NGT Act, 2010. It is further denied that NHAI and its Contractor are duty bound for restoration and restitution of the orchards/agricultural field of the Applicants to its original state and pay compensation. It is reiterated, as stated in the preceding paras above that the damage to the Applicants' property, if any, was due to the heavy rainfalls and not due to the construction activities of the Ring Road


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project. The purported damage is not due to the fault of NHAI or Contractor, and that there is no responsibility of NHAI or Contractor to restore & restitution of the Applicants' property. Hence, the reliance placed by the Applicants on Section 20 of the NGT Act, 2010 for imposition of suitable compensation is wholly inapplicable as presumptuous.

LIMITATION

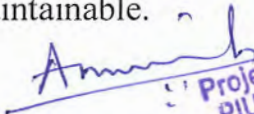
Contents of para are matter of record needs no reply.

PRAYER

Contents of prayer (a) to (d) are denied as false, misconceived and untenable. The present application is devoid of any substantiation and hence, the Applicants are not entitled to any relief of compensation as well as other reliefs as sought in the present application. The present petition deserves dismissal for being fallacious and untenable.

The answering Respondent further reserves its right to amend / file an additional reply to the application, if required at a later stage.

In view of the aforesaid submissions and objections, it is most respectfully prayed that the present application is totally misconceived and is, therefore, liable to be dismissed by this Hon'ble Tribunal as not maintainable.


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RESPONDENT NO.1

THROUGH


Singhania & Partners LLP
Solicitors & Advocates
P-24, Green Park Extension
New Delhi-110016

Dated:05.09.2024
Place: New Delhi

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

ORIGINAL APPLICATION NO. 620/2024

IN THE MATTER OF:

Bashir Ahmed Bhat & Ors.

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.... Respondents

AFFIDAVIT

I, Amrish Manikrao Mankar, Son of Sh. Manikrao Wamanrao Mankar, aged 49 years, working as Project Director at National Highways Authority of India, having office at Parraypora, Srinagar, do hereby on solemn affirmation state and submit as under:

1. I say that I am the authorized representative of the Respondent No.1 abovenamed and as such am conversant with the facts and circumstances of the present reply. I have been duly authorized by the Respondent No.1 to initiate and pursue the present proceedings for and on behalf of the Respondent No.1 and hence, I am competent to swear the present affidavit on the basis of the records being maintained by the Respondent No.1 in the ordinary course of its business.

I say that the accompanying reply to the original application has been drafted by my counsel on my instructions and I have read and understood the contents of the same. The contents of the reply are true and correct, which are reiterated herein and are not being repeated for the sake of brevity.

3. I say that the annexures filed along with the present reply are true copies of their respective originals.

Certified that the contents
declared on oath before me
on 05/9/24 at Srinagar
and who is identified by
Bashir

Gousia Jaff (Advocate)
Notary Public Srinagar

Amrish
DEPONENT
Project Director
PIU - Srinagar
National Highways Authority of India



VERIFICATION:

Verified at SK on this Sep day of August, 2024 that the contents of the above affidavit are true and correct to the best of my knowledge. No part of it is wrong and nothing material has concealed there from.

Amir
DEPONENT
Project Director
Srinagar
National Highways Authority of India



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Jhelum Swells, Sets Alarm Bells Ringing In Kashmir

by KO Web Desk — April 29, 2024

AA

185 SHARES 9.3k VIEWS



KO photo by Abid Bhat

Srinagar- Kashmir Valley remained on the edge on Monday as the water level in the Jhelum kept on rising due to incessant rains. The water level was at touching distance of 'alarm mark' of 18-ft in south Kashmir's Sangam gauge at 8 p.m.

"The water level recorded was at 16.91ft and as soon it crosses 21-ft mark, flood is declared," said an official of Irrigation & Flood Control Department.

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At Ram Munshi Bagh in Srinagar, the water was 14.00 ft against the alarm level of 18 ft and flood level of 21 feet, the officials said.

At Asham in northern Kashmir's Bandipora district, the official said, the Jhelum level was at 14.0ft, almost 2.5-ft when flood alarm is sounded.

Regarding some tributaries, the official said, the water level in Vishow Nallah at Khudwani was 7.74m, 1.68 m in Rambiyara Nallah at Wachi while the nallah Lidder at Batkoot was at 0.60m.

Read Also

► [Inclement Weather, Power Crisis](#)

► [Rains Inundate Srinagar Areas, Raise Questions On Smart City Planning](#)

Several areas of Bemina, one of the worst hit areas of Srinagar during once in a century floods in 2014, submerged.

Reports said the water from flood channel has seeped inside residential areas. Meanwhile, the department has urged people not to panic and remain "calm".

"Please remain calm, there is no need to panic and don't pay any heed to rumours," the official added.

In the related development, Deputy Commissioner Srinagar, Dr. Bilal Mohi-Ud-Din Bhat, who is also the Chairman District Disaster Management Authority (DDMA), chaired a meeting of concerned officers to review the flood control and mitigation preparations in the district.

Senior Superintendent of Police, Ashish Mishra was also present in the meeting.

At the outset, the DC stressed on utmost coordination among line departments and formulating an efficient plan to ensure prompt response to any flood like situation in the district.

He directed the officers to remain in the state of readiness by mobilising men and machinery on ground particularly at vulnerable spots to avoid any loss to human lives or property damages.

57
The DC laid emphasis on round the clock monitoring of vulnerable flood prone areas and ensuring timely dissemination of information among the people viz. flood alerts, evacuation points/centres, transportation plans, etc., so that people are updated about the evacuation/rescue plans well in time. He directed the concerned Officers to focus on the identified vulnerable spots so that rapid action is ensured in case of need or to arrest embankment breach, if any.

The DC further directed the concerned departments to formulate rescue plans, identify safe control room locations and also prepare a backup plan. He asked for strengthening communication with the ground level staff and people during any emergency so that people do not panic and get actual information about rescue measures and places available for the public.

The CMO was directed to ensure that important machinery/ medicines at health institutions are kept at safer places in all the Health Institutions.

He was also asked for evolving proper SoPs to deal with the floods as like the 'Code Blue' being followed in Hospitals, where every concerned individual is fully acquainted with their responsibilities in the times of emergency. (GNS)

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Rains trigger landslides, partially damage structures in Budgam

by **KH News Service** — May 1, 2024 in **Top News** Reading Time: 1min read

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Srinagar: Heavy rainfall over the past few days triggered landslides and damage to several structures in Budgam with a portion of an interior road, along with two boundary walls washed away into Doodganga Nallah at Darambugh Gopalpura Chadoora on Tuesday.

Residents said that water level surged in the Nallah Doodganga resulting in partial damage to two vehicles parked along the banks of the road.

Authorities swiftly mobilised rescue teams to assess the extent of the damage and restore electricity to the affected area.

The disruption in power supply occurred due to the damage to electricity poles and a transformer.

Rains have also led to landslides in several areas of Budgam triggering panic among residents. The main road from Ahanger Mohalla to Choontinar and Ahanger Mohalla to Wuder Mohalla Watakuloo witnessed landslides, disrupting traffic to upper areas such as Darwan, Chontinar, Challyan, Banjar and Bajipathri. However, no damage or casualties were reported due to these incidents.

In Teli Mohalla Watakuloo, a double-storied house belonging to Ab Rashid Mir sustained minor damage, with cracks developed in rooms due to the relentless rainfall. Similarly, reports of cracks in houses have also emerged from Choon Budgam.

In Chararipora, a landslide occurred behind the house of Ghulam Mohiuddin Dar, obstructing pedestrian to commute along the village canal. In Chararipora, the Pakka Bund suffered damage from the rains, affecting the flow of the second canal to the village

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NKC PROJECTS PVT. LTD.

(An ISO 9001 : 20015 Certified Co.)

NKCPPL/Site/Srinagar/2024-25/1287

Date: 30.04.2024

To,
The Project Director,
National Highways Authority of India,
PIU Srinagar, Opp. JeeEnn Sons,
Airport Road, Parry Pora, Srinagar -190005

Project: Construction of four lane Ring road /bypass around Srinagar city from Km 0+000 to km 42+100 (Phase-I) under NHDP phase VII in the union territory of Jammu and Kashmir under Bharatmala Pariyojana on EPC Mode.

Subject: Notice of Force Majeure-Non Political Event as per Clause 21.2 (a) and (f) of the Agreement -Hampering of work due to Unseasonal Heavy Rainfall and closure of Jammu-Srinagar NH44.

Reference:-

1. Authority's Letter No. PD/SGR/14055/2021/Ring Road/AE/255 Dated 02.04.2024
2. EPC Contractor's Letter No. NKCPPL/Site/Srinagar/2023-24/1265 Dated 30.03.2024
3. Authority's Letter No. PD/SGR/14055/2021/Ring Road/AE/254 Dated 19.03.2024
4. EPC Contractor's Letter No. NKCPPL/Site/Srinagar/2023-24/1253 Dated 18.03.2024

Dear Sir,

With reference to the above cited letters and mentioned subject, The EPC contractor has time to time intimated to your good office about the severe weather conditions in the valley and prolonged closures of the stand-alone National Highway.

The EPC Contractor is hereby informing your good office that the valley has been grappling with the adverse weather conditions for the past five days (26.04.2024 to 30.04.2024) following intense unseasonal rainfall, as detailed in the attached report. This deluge has resulted in flash floods in and around the project corridor, significantly affecting scheduled Project activities. The Project being at the critical stage of construction has encountered numerous challenges, leading to deviations from the submitted work schedule. Despite our proactive measures, including adjustments to ensure milestone completion, uncontrollable factors such as militant activities near the project site have already disrupted the project progress. This has resulted in labour desertion due to safety concerns, which is further exacerbated by the current adverse weather conditions, which often necessitate work suspension.

The government has also issued warning advisories regarding flood-like situations in the valley including closure of schools and colleges after heavy rainfall, posing a threat to labour retention and work continuity.

Site Office : NKC Base Camp Gudsathu, Tehsil & District Budgam Jammu & Kashmir-191111

E-mail : planning.srinagar@nkcproject.com

Regd. Office: 154 First Floor, Vardhman Crown Mall, Plot No. 2, Sector-19, Dwarka, New Delhi-110075

Corporate Office : Plot No. 872, Phase - V, Udyog Vihar, Gurugram-122016 (Haryana)

Ph.: +91-124-6902630, **E-mail :** info@nkcproject.com, **Website :** www.nkcproject.com



The stand-alone National Highway NH-44 has been closed from past 5 days due to the land slides at various locations. The project progress is badly affected by the closure of this only route connecting the Valley to the rest of the India. The Major material in demand at site needs to be transported on regular basis but the traffic advisory on this route typically permits only one-way traffic, making it impractical for the Contractor to transport bulk materials efficiently.

The photographs for visual context are hereby attached for depicting the site's current state.

In view of the above, the EPC Contractor requests AE to review its validity for consideration of the subject event under Force Majeure-Non Political Event as per Clause 21.2 (a) and (f) of the Agreement.

Thanking you and assuring of our full attention at all times.

Yours Faithfully,

for M/s NKC Projects Pvt. Ltd.

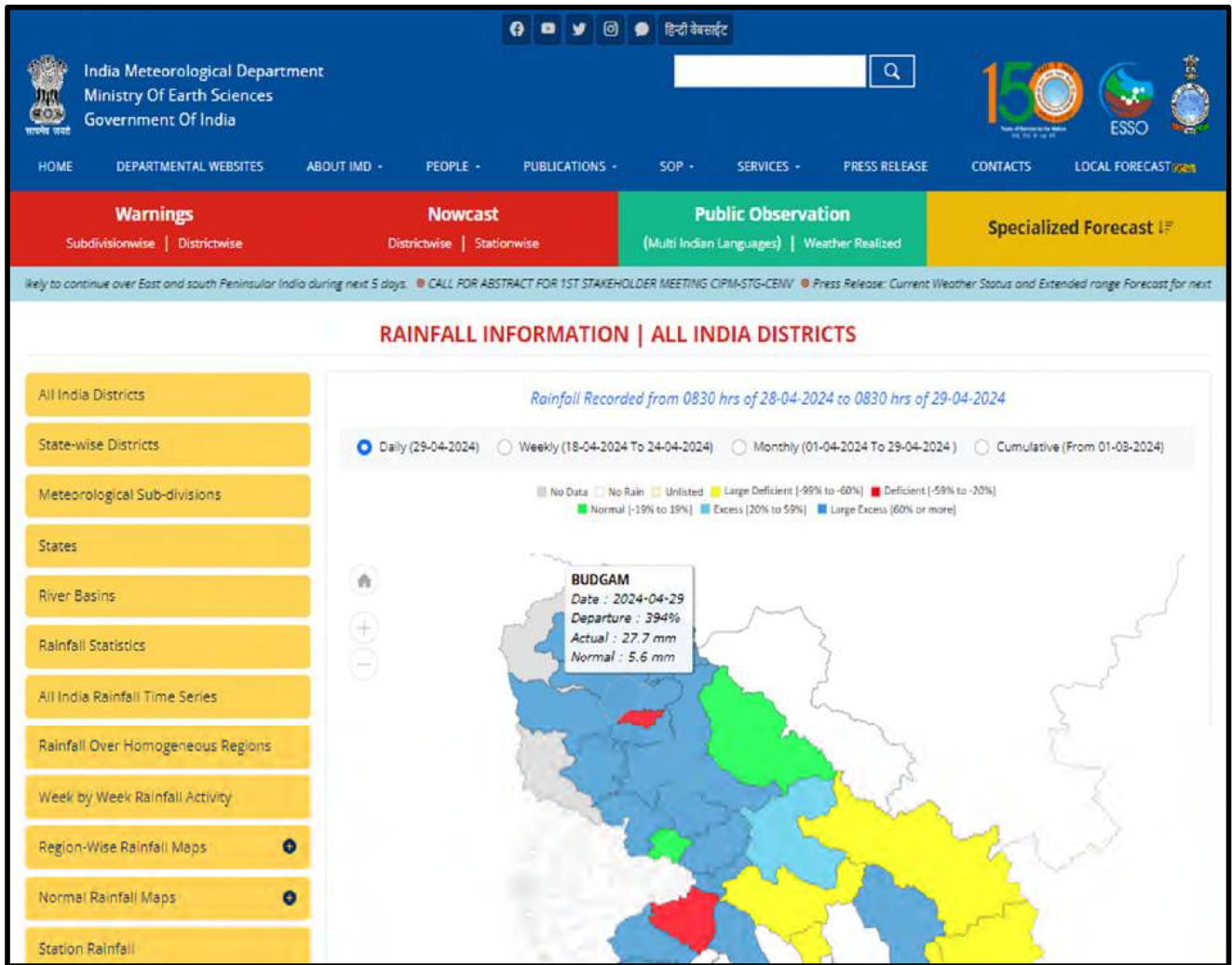


(E Chidambaram)

Chief Project Manager

Enclosures: As Above.

Copy to: The Team Leader, Rodic Consultants Pvt. Ltd in JV with MSV International Inc.



Rainfall Data of District Budgam

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TRENDING ▶ Lok Sabha Elections

Mera Power Vote

Jharkhand Board Result

Uttarakhand Board Result

PSEB 12th Result

CBSE Result

UK Board Result

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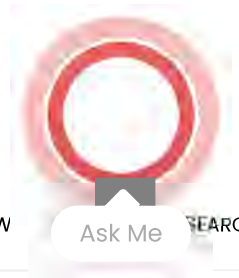
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J-K Weather: Heavy Rain Triggers Landslides, Highway Blocked,

Schools Closed Amid Warning | Details

Jammu And Kashmir Landslide: Jammu and Kashmir grapples with heavy rainfall and snowfall, causing landslides and collapsing over three dozen houses. Schools closed, exams postponed, and alerts issued as areas like Kishtwar face significant damage. Multiple landslides block roads, including the Jammu-Srinagar highway. Flood concerns rise as water levels increase, leading to evacuations.

By Deeksha Gour Updated: Tue, 30 Apr 2024 10:15 AM (IST) Source:JND

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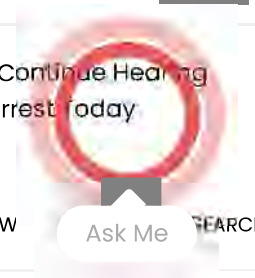
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Heavy Rain Triggers Landslides in J&k (Image credit/ Jagran.com)

Jammu And Kashmir Landslide:
 Jammu and Kashmir is currently



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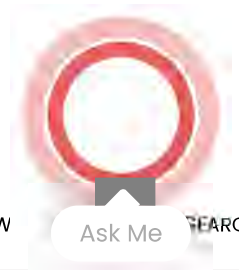
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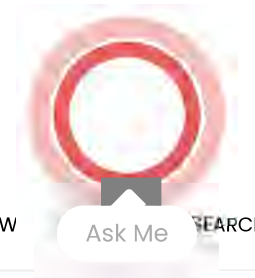
Meteorological Department has issued warnings of further snowfall and rain in most areas on Tuesday, leading to the closure of schools and

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the postponement of the Junior Assistant exam.

Kishtwar, a district heavily affected by the calamity, witnessed the damaging impact as 12 houses succumbed to the heavy rains, prompting authorities to elevate the disaster response machinery to high alert. Reports from concerned tehsildars indicate that the areas of tehsil Nagaseni, Mughalmaidan and Kishtwar have suffered considerable harm.

Schools To Remain Closed In Kashmir



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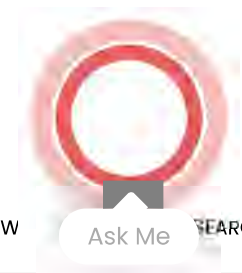
Junior Assistant type examination scheduled for the day has been postponed. Commuters have been advised to steer clear of the Jammu-

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Srinagar Highway until the debris caused by landslides is cleared.

Jammu and Kashmir Rains: Red Alert Issued For Kishtwar District

The remote and hilly regions have been severely affected, with several areas completely cut off from their respective district headquarters due to damaged roads and landslides. Additionally, a red alert has been issued for the Kishtwar district. Four individuals swept away by rivers and streams in Doda, Ramban and Gulabgarh of Raesi, with two bodies having been recovered. Furthermore, a bus carrying passengers, including



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Jammu And Kashmir Snowfall: Roads Closed

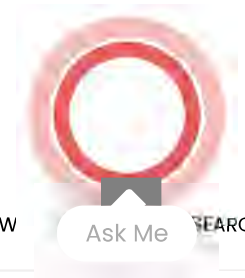
Multiple landslides along the Jammu-Srinagar highway in Ramban district have brought traffic

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to a halt. Furthermore, the Mughal Road, which connects Kashmir via Poonch, was already closed prior to the recent events. The mountains of Kashmir, including the popular tourist spot Gulmarg, now bear a blanket of snow, increasing the risk of avalanches in North and Central Kashmir.

Jammu And Kashmir Landslide: Water Level Increased Due To Continuous Rain, 336 Families Evacuated

Adding to the woes, continuous rainfall over the past four days in Jammu has caused water levels in



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Jammu And Kashmir Warning: Four storey house collapsed in Gulabgarh

A four-storey house collapsed in Gulabgarh and three houses

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collapsed in Poonch district due to the destruction of landslide. In Mandi, Poonch, a bus carrying school children veered off the road and fell into a ditch, injuring 12 children. Kishtwar also witnessed damage, with 12 houses and a school affected. Additionally, eight individuals, including two children, sustained injuries when a house was struck by a landslide in Bhujithala, Uri. In another incident near S bridge in Uri, two people were injured due to a landslide.

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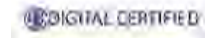
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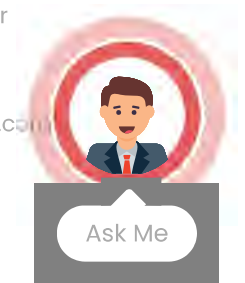
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Jhelum Swells, Sets Alarm Bells Ringing In Kashmir

by KO Web Desk — April 29, 2024

AA

185 SHARES / 9.3k VIEWS



KO photo by Abid Bhat

Srinagar- Kashmir Valley remained on the edge on Monday as the water level in the Jhelum kept on rising due to incessant rains. The water level was at touching distance of 'alarm mark' of 18-ft in south Kashmir's Sangam gauge at 8 p.m.

"The water level recorded was at 16.91ft and as soon it crosses 21-ft mark, flood is declared," said an official of Irrigation & Flood Control Department.

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At Ram Munshi Bagh in Srinagar, the water was 14.00 ft against the alarm level of 18 ft and flood level of 21 feet, the officials said.

At Asham in northern Kashmir's Bandipora district, the official said, the Jhelum level was at 14.0ft, almost 2.5-ft when flood alarm is sounded.

Regarding some tributaries, the official said, the water level in Vishow Nallah at Khudwani was 7.74m, 1.68 m in Rambiyara Nallah at Wachi while the nallah Lidder at Batkoot was at 0.60m.

Read Also

► [Inclement Weather, Power Crisis](#)

► [Rains Inundate Srinagar Areas, Raise Questions On Smart City Planning](#)

Several areas of Bemina, one of the worst hit areas of Srinagar during once in a century floods in 2014, submerged.

Reports said the water from flood channel has seeped inside residential areas. Meanwhile, the department has urged people not to panic and remain "calm".

"Please remain calm, there is no need to panic and don't pay any heed to rumours," the official added.

In the related development, Deputy Commissioner Srinagar, Dr. Bilal Mohi-Ud-Din Bhat, who is also the Chairman District Disaster Management Authority (DDMA), chaired a meeting of concerned officers to review the flood control and mitigation preparations in the district.

Senior Superintendent of Police, Ashish Mishra was also present in the meeting.

At the outset, the DC stressed on utmost coordination among line departments and formulating an efficient plan to ensure prompt response to any flood like situation in the district.

He directed the officers to remain in the state of readiness by mobilising men and machinery on ground particularly at vulnerable spots to avoid any loss to human lives or property damages.

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The DC laid emphasis on round the clock monitoring of vulnerable flood prone areas and ensuring timely dissemination of information among the people viz. flood alerts, evacuation points/centres, transportation plans, etc., so that people are updated about the evacuation/rescue plans well in time. He directed the concerned Officers to focus on the identified vulnerable spots so that rapid action is ensured in case of need or to arrest embankment breach, if any.

The DC further directed the concerned departments to formulate rescue plans, identify safe control room locations and also prepare a backup plan. He asked for strengthening communication with the ground level staff and people during any emergency so that people do not panic and get actual information about rescue measures and places available for the public.

The CMO was directed to ensure that important machinery/ medicines at health institutions are kept at safer places in all the Health Institutions.

He was also asked for evolving proper SoPs to deal with the floods as like the 'Code Blue' being followed in Hospitals, where every concerned individual is fully acquainted with their responsibilities in the times of emergency. (GNS)

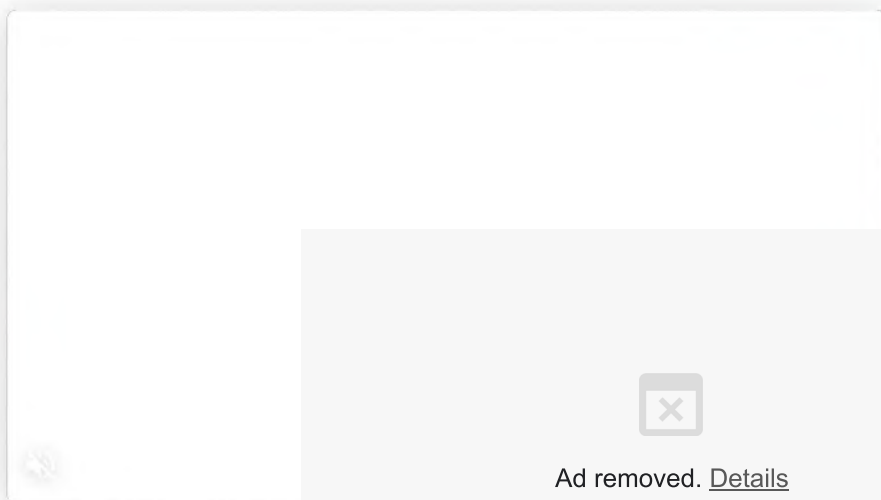
Landslides Block Highway, Mughal Road Remains Closed


By KR Desk on 6:30 am April 30, 2024 · No Comment



Jammu: The Jammu-Srinagar highway was closed Monday following multiple landslides triggered by rains that lashed wide parts of Jammu and Kashmir overnight, officials said.

The highway, the only all-weather road linking Kashmir with rest of the country, was blocked by landslides at Mehar, Gangroo, Mom Passi and Kishtwari Pather in Ramban district.




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The rains are continuing, hampering restoration works, they said, advising commuters to avoid journey on the highway till it is cleared of the debris. “Jammu-Srinagar highway blocked due to landslides/ mudslides/shooting stones at many places, heavy rainfall on whole NHW,” a traffic department official said, adding, “People are advised to avoid journey on NH-44 till the weather improves and road is clear. Please ask TCU for latest update.”

Mughal road, an alternate route linking Poonch and Rajouri districts in Jammu with south Kashmir’s Shopian district, remained closed for the third day owing to snowfall in Peer Ki Gali and adjoining areas, the officials said.

Amid the incessant rains, authorities in Kishtwar have ordered closure of schools in the district.

The decision to suspend class work for the day has been taken in the interest of prioritising the safety and well-being of students, staff, and the broader community given the current challenges posed by the adverse weather conditions, an official said.

He said efforts are on to restore water supply to Kishtwar town which was snapped following significant damage to the main 250 mm diameter water supply pipes of the Naigad Water Supply scheme at Hunjala on Sunday.

Police officials said two houses were damaged due to landslide at Basha-Simbool village of Kishtwar, while dozens of livestock perished in incidents of lightning and flash floods in Ramban and Samba districts overnight.

Rains lashed many parts of Jammu and Kashmir for the second day on Monday.



Landslides Block Highway, Mughal Road Remains Closed added by KR Desk on 6:30 am April 30, 2024


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OFFICE OF THE REHSILDAR SOUTH SRINAGAR PHASE 1st EVACUATION REQUIRED IN CASE OF FLOOD SITUATION

S No	EVACUATION	AREAS AFFECTED POSSIBLE	RELIEF/CAMP CAPSITY LOCATION USES PEOPLE WILL BE SHIFTED	Name & Contact of Head of Mohalla Committee	Name & Contact No of Concern Patwari/GQ	Name & Contact No of Concern Lumberdar ,Chowkedar
1	Phase 1st	Kursoo Padshi bagh	Sanatnagar Marriage Hall	Mahboob Ahmad Sheikh,8899916114	Sabder Hussain,Ajaz Ul Haq,7006273405,9906700091	Manzoor Ahmad Sheikh,9419435426
		mahjoor Nagar		GUL Mohammad Dar,9622074490		
		CharliPora		Bashir Ahmad Mir,9419004064		
		Gund Chandal		Ghulam Mohammad /Mohd Maqbool,9596414630,962 2460781		
		NaikPora		Sajad Ahmad Naik,9419629124		
		Kursoo Ghat		Ashiq Ahmad Dar,8899916114		
2	Phase 1st	Rambagh	Marriage Hall Goripora	Abdul Rashid Rashe,7006278928	Saleem Altaf ,9484001161	Mohammad Ashraf Bhat,9697305706
		Old Barzulla		Ghulam Mohammad Magrray,9797167018		
		Gung Bugh		Abdul Majeed Bhat,7006984471		
		Bul Bul Bagh		Manzoor Ahmad Malik,9419015437		
3	Phase 2nd	Jawahar Nagar	ERA Complex Rambagh	Zaffar Qureshi,9419065687,9419001907	Saleem Altaf ,9484001161	Mohammad Ashraf Bhat,9697305706
		Lal Mandi		Tariq Ahmad Bhat,9205155764		
		Ikhrajpora		Mushtaq Ahmad Dar,6006118067		

4	Phase 2nd	Gogji Bagh	M E T High School RawatPora	Ghulam Rasool Nadaf,9622062829	Saleem Altaf ,9484001161	Mohammad Ashraf Bhat,9697305706
		Solina		Ghulam Mohammad Sheikh,9906496174		
		Allochi Bagh		Asif Majeed ,9541191120		
		Magrma Bagh		Ajaz Ahmad Mir ,7006800280		
5	Phase 2nd	Maisuma	IMPA	Mukhtar Ahmad ,9797730508	Sheikh Mohammad Altaf,7889307341	Abrar Ahmad,7006922886
		Gow Kadal		Haji Abdul Gani,9419006240		
		Kukar Bazar		Nakeeb Ahmad,9906710201		
		Sheikh Bagh		Ferooz Ahmad Sheikh,7006040097		
		Abi Guzar		Aamir Ashraf Bhat,7006131274		
		Samander Bagh Bar Bar Shah		Rayees Ahmad Bhat,7006887118		

Forward in original to the deputy Commissioner for favour of information

Tehsildar South Srinagar



GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE DEPUTY COMMISSIONER
(DISTRICT MAGISTRATE) ANANTNAG

Ph: 01932-222337 (o), 01932-223164 (Fax); email: anantnag@nic.in

Subject: Weather Advisory.

27th-April-2024
ANANTNAG

ADVISORY

In view of inclement weather with forecast of rainfall from 27th to 29th of April-2024 by the Indian Metrological Department [IMD], the public especially those residing on the banks of river Jehlum and their tributaries and Nallhs are advised to refrain from venturing around the river and limit their activities till the improvement of weather. Also, the tourists, locals, trekkers and hikers shall refrain their hiking before improvement in the weather conditions and situation of these Alpine reaches.

In case of any emergency, General Public may call Control Room on following numbers 01932-222255, 01932-222187, 01932-222188, 01932-222337 and may also call to District Flood Coordination Committee on following numbers .

S. No.	Name of Department	Control Room No	Cell No
1	Police Control Room Anantnag	01932-222870	9596777669 9419051940
2	KPDCL		7780903057
3	Flood Control		9419185593 9622866049 9419042021
4	R&B Circle Anantnag		7889407250
5	Mechanical		9419062255
6	FCS&CA		9622604222
7	Fire & Emergency Services	01932-222822	9797156911
8	Health	01932-222255	9906547659

No:- DCA/PA/2024-25/51-70

Dated:- 27-04-2024

Copy to the:

1. Divisional Commisioner Kashmir for information.
2. Sr. Superintendent of Police Anantnag.
3. Superintending Engineer KPDCL/ Hydraulic/R&B Circle Anantnag for information and necessary action.
4. SDM(s)..... All for information for information and necessary action.
5. Tehsildar(s)..... All for information for information and necessary action.
6. All Concerned for information for info ration and necessary action


 Chairman, DDMA
 (Deputy Commissioner)
 Anantnag

27-04-2024



GOVT. OF JAMMU & KASHMIR.

OFFICE OF THE DISTRICT MAGISTRATE GANDERBAL

web: www.ganderbal.nic.in

Tel /Fax: 0194-2416142/141
Email: dmganderbal@gmail.com

O R D E R

Pursuant the reports from Zonal Educational Officers & Chief Education Officer, Ganderbal and due to the prevailing weather conditions and the resulting hazardous & slippery road conditions, it is hereby ordered that the class work in all educational Institutions up to the Higher Secondary level falling under the jurisdiction of Sub Division Kangan shall remain suspended on 29/04/2024 for the safety and well-being of students.

Sd/-
**District Magistrate
Ganderbal.**

NO: - ADM/GBL/PS/2024/ **527.**

Dated: -29/04/2024

Copy for information to the:

- 1) Divisional Commissioner Kashmir
- 2) District Magistrate Ganderbal for inf.
- 3) Sr. Superintendent of Police, Ganderbal for inf.& n/a.
- 4) Sub -Divisional Magistrate Kangan for inf. & N/A.
- 5) Chief Education Officer Ganderbal for N/A.
- 6) ZEO.....for N/A
- 7) All Concerned.....for compliance
- 8) I/C District Control Room Ganderbal for inf. & N/A
- 9) I/C PCR Ganderbal for inf. & N/A


Gulzar A.Khan, JKAS
Addl District Magistrate
(ADC)
Ganderbal



No.MD/KPDCL/TS /559-65
Government of Jammu & Kashmir
 Office of Managing Director
 Kashmir Power Distribution Corporation Ltd.



27.04.2024

URGENT/ OUT TODAY

Executive Engineers (All),
 KPDCL.

Sub: Flood Preparedness of KPDCL – directions thereof.

In view of ongoing heavy rains, weather advisory and directions given by the Chief Secretary, J&K, during flood preparedness meeting held today on 27.04.2024, you are hereby directed to take following measures with immediate effect:

S. No.	Measures to be taken
1.	Mapping of flood-prone areas with Electric Subdivisions, with focus on safeguarding critical infrastructure & real time response.
2.	Stocking of material to be used for immediate restoration of power supply, in case of emergency situation that may arise due to floods.
3.	Keeping mobile substations, vehicles and cranes in active mode.
4.	Empaneled contractors to be activated by all Electric Divisions.
5.	Real time response for immediate restoration of power supply to hospitals, water supply schemes, de-watering stations, District & Police Headquarters & Emergency Control Rooms, in case of floods.
6.	Nominate a Single Point of Contact (SPOC) in each Electric Division who shall liaise with all stakeholder departments like I&FC, District Administration and KPDCL.

Further, you are also directed to assign duties to the KPDCL staff and establish Divisional Control Rooms for putting in place an effective management and response system.

A copy of the Action Taken Report(s) shall also be shared with this office on regular basis.


 (Mussarat Islam), JKAS,
Managing Director,
 KPDCL.

Copy to:

1. Principal Secretary to the Government, Power Development Department, Civil Secretariat, Jammu/ Srinagar, for kind information.
2. Divisional Commissioner, Kashmir, for kind information.
3. Deputy Commissioners (All), Kashmir Division, for kind information.
4. Chief Engineer, Distribution, KPDCL, for information.
5. Superintending Engineers, All O&M Circles, KPDCL, for information and n/a.
6. SDOs, All Electric Subdivisions, KPDCL, for information and immediate n/a.



सत्यमेव जयते

**GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE DEPUTY COMMISSIONER / DISTRICT MAGISTRATE/
CHAIRMAN DISTRICT DISASTER MANAGEMENT AUTHORITY
SRINAGAR**

Email:dcsgr-jk@nic.in, Phone No. 0194-2477033/ 2472580

WEATHER ADVISORY

In view of the inclement weather with forest of rainfall continue **till 30th April** by the Indian Metrological Department (IMD) Srinagar Station, the people of the District in general, and those residing on the left and Right Banks of River Jhelum its Tributaries and Nallahs in particular are advised to refrain from venturing in and around these water bodies and limit their activities till the improvement of weather.


Further, the Tourists, local Shikara Wallas, Sand Miners and Boat Ferries in Jhelum/ Dal Lake for travel shall not attempt to cross before verifying the condition and situation of these water bodies.

The general public can contact on the below numbers in an inundation situation or water lodging.

S.No	Name of Department	Control Room	Cell No
1	Police Control Room	0194-2477567	9419411619
2	Emergency Operation Centre (EOC) Srinagar	+911942502254	
2	Irrigation & Flood Control	0194-2502946	6005701269
3	Fire & Emergency	101	
4	Urban Environmental Engineering Deptt. (UEED)		7889890395

No; DCS/DDMA/Thq/24/1733-56

Date: **28/04/2024**


Addl. Deputy Commissioner,
Srinagar.

Copy to:

1. Divisional Commissioner Kashmir for Information.
2. Senior Superintendent of Police for Information.
3. Commissioner Srinagar Municipal Cooperation (SMC) for Information.
4. RTO Srinagar for Information
5. Superintending Engineers of I&FC, PHE (Jal Shakti), KPDCL,PWD (R&B), ME department for Information
6. Assistant Director FCS&CA Srinagar for Information
7. Chief Medical Officer Srinagar for Information
8. Tehsildars _____ (All)for Information
9. Deputy Director PR for Information
10. Deputy Controller Civil Defence for Information
11. Deputy Commandant NDRF Srinagar for Information
12. Deputy Director F&ES Srinagar for Information
13. Nodal officer SEOC for the dissemination of Advisory through (CAP).
14. I/C SDRF Component Srinagar for Information

Type of Structure	CA Existing Chainage	Design Chainage	Span			Status
Minor Bridge	9+405	9+407	1	X	15	Completed
Minor Bridge	9+513	9+521	1	X	15	Completed
Minor Bridge	9+600	9+604	1	X	9	Completed
LVUP	9+900	9+900	1	X	12	Completed
Minor Bridge	10+085	10+100	1	X	22	Completed
Minor Bridge	10+685	10+685	2	X	30	Super Structure in progress
LVUP	11+025	11+025	1	X	12	Completed















 GPS Map Camera



Bagh Buchroo, null, null
XR8C+38, Bagh Buchroo, 191113
Lat 33.965128°
Long 74.823173°
26/07/24 05:32 PM GMT +05:30




 GPS Map Camera



Bagh Buchroo, null, null
XR8C+38, Bagh Buchroo, 191113
Lat 33.965267°
Long 74.82301°
26/07/24 05:26 PM GMT +05:30

Google




 GPS Map Camera

Bagh Buchroo, null, null
XR8C+38, Bagh Buchroo, 191113
Lat 33.96528°
Long 74.823085°
26/07/24 05:26 PM GMT +05:30






 GPS Map Camera



Bagh Buchroo, null, null
XR8C+38, Bagh Buchroo, 191113
Lat 33.965119°
Long 74.822914°
26/07/24 05:32 PM GMT +05:30



 GPS Map Camera



Bagh Buchroo, null, null
XR8C+38, Bagh Buchroo, 191113
Lat 33.965259°
Long 74.823002°
26/07/24 05:27 PM GMT +05:30



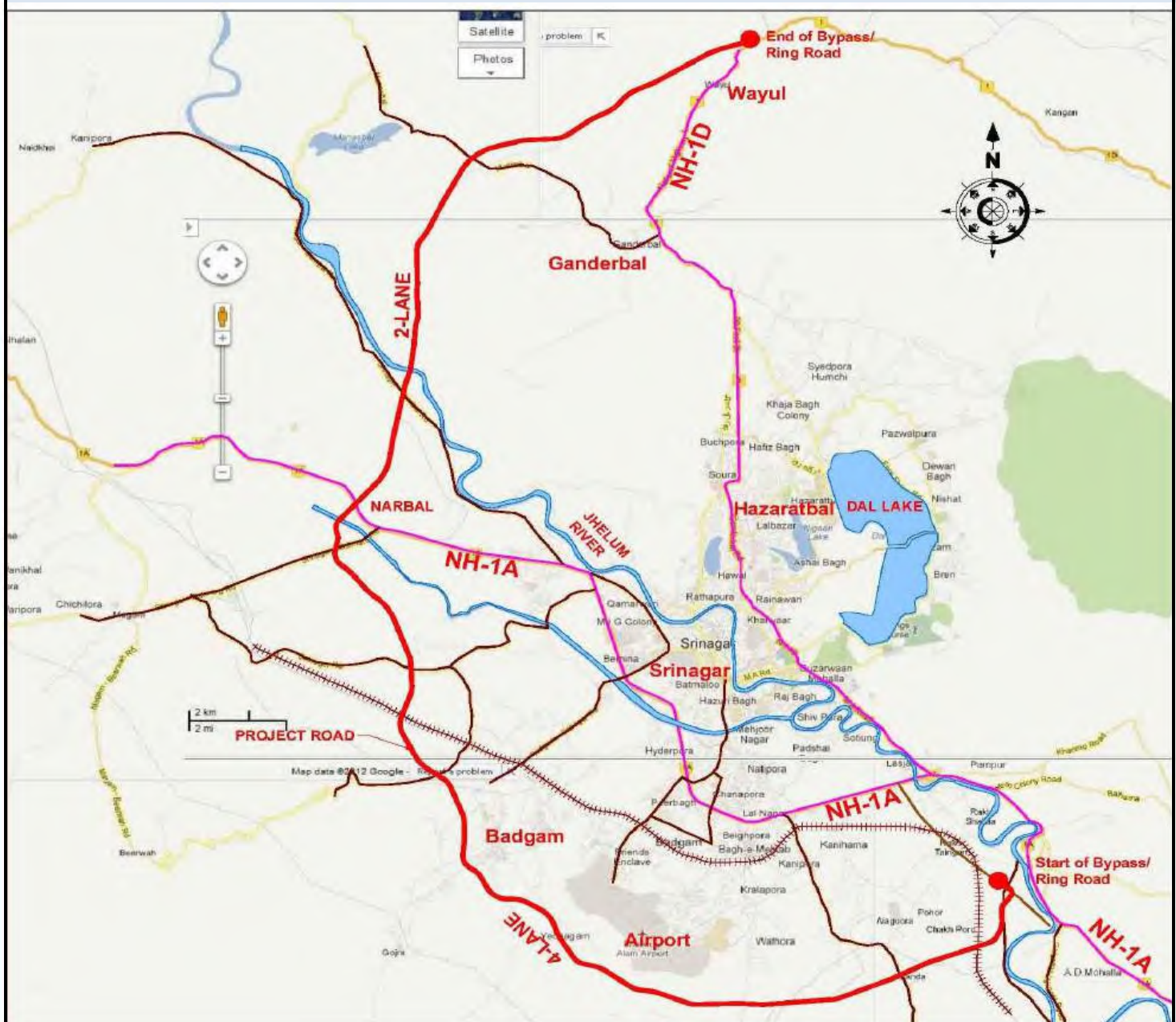


NATIONAL HIGHWAYS AUTHORITY OF INDIA

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

Consultancy Services for Preparation of Feasibility-cum-Preliminary Design Report for construction of stand alone Ring Road/Bypass around Srinagar city in the State of Jammu and Kashmir under NHDP Phase VII

Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) Report



Submitted By:

July 2016

QCI/NABET-Accreditation Sl.No. 107



Louis Berger Consulting Pvt. Ltd.

Engineers • Planners • Scientists • Economists

Plot No. B 3-6, Sector - 32, Gurgaon, Haryana, India



Appendix - 1: Compliance of TOR

Project road is discussed in 135th Meeting of the Expert Appraisal Committee for Building/Construction Projects/Township and Area Development Projects, Coastal Regulation Zone, Infrastructure Development and Miscellaneous projects held on 1st August 2014 at New Delhi.

Sl. No.	TOR Points	Compliances	Remarks
i	The proposal indicates No National Park, Wildlife Sanctuary and Critically Polluted Area falls within 10 km radius of the proposed project area.	Two wetland namely Hokerser Wetland and Mirgund Wetland located within 10km radius of the project road	Refer Chapter -3, 3.2.6
ii	It is indicated that 17929 nos. trees fall within the proposed RoW. Bare minimum trees to be cut. The information about their species and whether it also involves any protected or endangered species be provided. Necessary green belt shall be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.	Only 17929 trees are proposed to be fell from agriculture land Dominant species of trees to be affected are Popular plantations average girth size of trees are 20cm	Refer Chater-3 of EIA report.
iii	Submit the details of the water bodies along the project road.	Surface water sources viz., rivers, canals, drains, etc has been identified which has been enumerated in Table 3.10	Refer chapter -3 section 3.3.3.
iv	Explore the possibilities for utilization of fly ash.	No Thermal Power Plant Exist within the 100km radius of the project road.	
v	Explore the possibilities of cold mix technology instead of hot mix technology.	Though cold mix technology is environmental friendly, they are <i>mostly used for repair works and low volume traffic roads across the world.</i> According to Asphalt Paving Association of Iowa, "Cold mix asphalt may be used for surface, base, or sub-base courses if the pavement is properly designed. <i>Cold mix surface courses are suitable for light and medium traffic; however, they normally require a seal coat or hot</i>	



Sl. No.	TOR Points	Compliances	Remarks
		<p><i>Asphalt Concrete overlay as surface protection.</i>" It is also observed that cracks may appear in newly laid Cold mix Asphalt Concrete due to heavy traffic in hot weather. Accordingly, the Consultant proposes to used Hot mix bituminous concrete (HMA) for Srinagar Bypass as per the IRC codal recommendations.</p>	
vi	Submit details on borrow areas as per OM dated 18.12.2012.	Details of borrow areas are presented in Table 3.15 :	Refer chapter -3
vii	Examine and submit a brief description of the project, project name, nature, size, its importance to the region/state and the country.	<p>Project name: <i>Consultancy Services for Preparation of Feasibility cum Preliminary Design Report for Construction of stand alone Ring Road / Bypass around Srinagar city in the state of Jammu and Kashmir</i></p> <p>Brief of project: Presently Srinagar City is connected with southern part of India through NH1A which is passing through the heart of the Srinagar City. Due to the congestion in the city a bypass on the south western side of Srinagar was built. The said bypass starts from Phantha chowk (South of Srinagar) and ends at Parimpora (North of Srinagar). The length of the existing bypass is about 17.6 km.</p> <p>Due to weakening of militancy, the economic enhancement within the influence area many activities have coming up in the Valley. And they are growing in very fast pace. Also many migrated people due to militancy are coming back to Srinagar. In addition to the above all, day to day increase of tourist and</p>	



Sl. No.	TOR Points	Compliances	Remarks
		<p>also famous pilgrimage to Amarnath are further congesting the existing facility. The existing bypass is already congested by presently constructed and being constructed residential colonies and commercial complexes. To avoid further congestion the proposal of construction of greater bypass at the outer periphery of Srinagar city is well judged.</p> <p>All possible alternative alignments have been studied carefully and a best feasible alignment from geometry, social and environmental point of view is proposed. The proposed bypass will also facilitate the Northern traffic to Leh and Ladak to bypass the Srinagar city. The total length of the bypass is 60.9 km and start of the bypass is at Galander and ends at Wayul.</p>	
viii	In case the project involves diversion of forests land, guidelines under OM dated 20.03.2013 may be followed and necessary action taken accordingly.	No RF/PF land is involved, 200 meters of alignment of proposed bypass is passing through social forest land which will divert about 1.3480ha of forest land	
ix	Details of any litigation(s) pending against the project and/or any directions or orders passed by any court of law/any statutory authority against the project to be detailed out.	NA	
X	Submit detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern, habitation, cropping pattern, forest area, environmentally sensitive places, mangroves, notified industrial areas, sand dunes, sea, river, lake, details	<p>Terrain: Terrain along the project road is plain terrain except for few km hilly stretches.</p> <p>Landuse: Approximately 378 ha land proposed to be acquired for the proposed bypass. The nature of land is</p>	Submit detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern,



Sl. No.	TOR Points	Compliances	Remarks
	of villages, teshils, districts and states, latitude and longitude for important locations falling on the alignment by employing remote sensing techniques followed by ground truthing and also through secondary data sources	<p>63.9% agricultural, 18.9% Barren/Govt. and remaining 17.2% other lands (Orchard + Built-up area).</p> <p>Forest Area: Aprox. 1.3480ha.of territorial forest land is proposed for diversion.</p> <p>Environmentally Sensitive Places: No Wildlife Sanctuary/ National Park located within the 10km radius of the project road. No other notified eco sensitive area exists within 10km radius of the project except Hokerser Wetland and Mirgund Wetland located 215m and 195m respectively, away from the proposed alignment of Ring road/ Bypass.</p> <p>Mangroves: No such issue is involved</p> <p>Notified Industrial Areas: Project road does not passes through notified industrial area</p> <p>Sand Dunes: No such issue is involved.</p> <p>Sea: Not applicable.</p> <p>River: Project road cross two rivers.</p> <p>Wetland: Hokerser Wetland and Mirgund Wetland located 215m and 195m respectively, away from the proposed alignment of Ring road/ Bypass.</p> <p>Detail of : District: The project passes</p>	<p>habitation, cropping pattern, forest area, environmentally sensitive places, mangroves, notified industrial areas, sand dunes, sea, river, lake, details of villages, teshils, districts and states, latitude and longitude for important locations falling on the alignment by employing remote sensing techniques followed by ground truthing and also through secondary data sources</p>



Sl. No.	TOR Points	Compliances	Remarks
		<p>through 6 districts viz Pulwama, Budgham, Baramulah, Srinagar, Bandipora and Gandharbal in the state of J&K</p> <p>Tehsil: The project road passes through 10 Tehsils viz Pampore, Pulwama, Chadora, Budgham, Beerwa, Pattan, Chaterbal, Sumbal Sonawari and Laar.</p> <p>Villages:</p> <p>Kandizal, Khadermoh, Nihama, Chek Pohru, Kothipora, Sanzpora, Zinpora, Doonivora, Bugham, Ballpora, Batpora, Wathora, bichru, ganjbagh, lalgham, godisotu, thagpora, ichkoot, ichgham, aarampora, budibhag, dangerpora, razwan, choon, mamath, shogipora, zugu, budgham, paler, neslapor, warpora, haran, soibugh, daharmun, rathsun, gotipora, chirpora, narbal, gagarpora, jawahirpora, mirgund, rambirgad, parihaspora, wadwan, tirgham, shadipora, shilwat, dub, waqoora, badampora, kurhama, borsu, watlar, lar, wayul</p>	
XI	Describe various alternatives considered, procedures and criteria adopted for selection of the final alternative with reasons.	Alternatives of alignment study has been carried out, detail of option of studies is presented in Chapter-5	Refer Chapter-5 of EIA report
XII	Submit Land use map of the study	Terrain: Terrain along the	



Sl. No.	TOR Points	Compliances	Remarks
	<p>area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc. and submit a detailed ground surveyed map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archeological & religious, monuments etc. if any.</p>	<p>project road is plain terrain except for few km hilly stretches.</p> <p>Landuse: Approximately 378 ha land proposed to be acquired for the proposed bypass. Around The nature of land is 63.9% agricultural, 18.9% Barren/Govt. and remaining 17.2% other lands (Orchard + Built-up area).</p> <p>Forest Area: Aprox. 1.3480ha.of territorial forest land is proposed for diversion</p> <p>Environmentally Sensitive Places: No Wildlife Sanctuary/ National Park located within the 10km radius of the project road. No other notified eco sensitive area exists within 10km radius of the project except Hokerser Wetland and Mirgund Wetland located 215m and 195m respectively, away from the proposed alignment of Ring road/ Bypass.</p> <p>Mangroves: No such issue is involved</p> <p>Notified Industrial Areas: Project road does not passes through notified industrial area</p> <p>Sand Dunes: No such issue is involved.</p> <p>Sea: Not applicable.</p> <p>River: Project road cross two rivers.</p> <p>Wetland: Hokerser Wetland and Mirgund Wetland located</p>	



Sl. No.	TOR Points	Compliances	Remarks
		215m and 195m respectively, away from the proposed alignment of Ring road/ Bypass.	
XIII	If the proposed route is passing through any hilly area, examine and submit the stability of slopes, if the proposed road is to pass through cutting or embankment / control of soil erosion from embankment.	About 2 km of the proposed bypass is passes through hill section. Cutting of hill will utilizes in raising height of embankment of proposed bypass	
XIV	If the proposed route involves tunneling, the details of the tunnel and locations of tunneling with geological structural fraction should be provided. In case the road passes through a flood plain of the river, the details of micro drainage, flood passages and information on flood periodicity at least of last 50 years in the area should be examined.	No tunnel is proposed under the project.	
XV	The projects is located within 10km. of the sanctuary a map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden thereon should be furnished at the stage of EC.	No Sanctuary located within 10 km radius of the project road.	
XVI	Study regarding the Animal bypasses / underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas.	Adequate no. of Animal bypasses / underpasses etc. across the habitation areas shall has been proposed under the project.	Refer Chapter-2 of EIA report
XVII	The information should be provided about the details of the trees to be cut including their species and whether it also involves any protected or endangered species. Measures taken to reduce the number of the trees to be removed should be explained in detail.	Maximum portion of the proposed project road passes through cultivated land. During the baseline survey it is estimated that the construction of Sri nagar Bypass needs approximately 17929 trees to be felled down.	Refer cgapter-3



Sl. No.	TOR Points	Compliances	Remarks
	Submit the details of compensatory plantation. Explore the possibilities of relocating the existing trees. Animal and wild life crossings to be provided in areas inhabited by wild life.	The list of tree enumeration is presented in Table 3.14	
XVIII	Necessary green belt shall be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.	Already given in EMP section, P.6.1, C.1.1, and table 9.1	
XIX	If the proposed route is passing through a city or town, with houses and human habitation on the either side of the road, the necessity for provision of bypasses/diversions/under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol station/service centre, rest areas including public conveyance, etc. Noise reduction measures should also be indicated	Near by the city or town, with houses and human habitation on the either side of the road, the provision of Service road, under passé, way side amenities, Petrol stations, rest areas has been proposed for the bypass.	Refer Chapter-2 of EIA report
XX	Submit details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges, if any	Refer chapter-2	
XXI	Assess whether there is a possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents).	No, After the construction of proposed bypass it will decongest the traffic inside the Srinagar city.	
XXII	Examine and submit the details of use of fly ash in the road construction, if the project road is located within the 100 km from the Thermal Power Plant.	No Thermal Power Plant Exist within the 100km radius of the project road.	
XXIII	Examine and submit the details of sand quarry, borrow area and rehabilitation.	Construction material required under the project are as	Refer 3.6 of Chapter 3 and Chapter-4 of EIA



Sl. No.	TOR Points	Compliances	Remarks
		4,79,000 MT fine aggregate, 44,00,000 MT coarse aggregate, 2,23,000 MT cement and 855.80 KLD water 19,85,000 cum Borrow Detail of location and rehabilitation plan in Chapter- 3 and Chapter-4 of EIA Report	report
XXIV	Explore the possibilities of utilizing the debris/ waste materials available in and around the project area.	Suitable debris will be utilized for filling of embankment	Refer P.7.7, C.1.2
XXV	Submit the details on compliance with respect to Research Track Notification of MoRTH.	As per the MORTH guidelines debris and waste materials will be utilised as extent as possible	Refer EMP
XXVI	Examine and submit the details of sand quarry and borrow area as per OM no. 2-30/2012-IA-III dated 18.12.2012 on 'Rationalization of procedure for Environmental Clearance for Highway Projects involving borrow areas for soil and earth' as modified vide OM of even no. dated 19.03.2013.	Details of borrow areas are presented in Table 3.15	
XXVII	Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclone and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.	Details are given in Chapter -3	Refer section 3.2.1 of Chapter-3 of EIA report
XXVIII	The air quality monitoring should be carried out as per the new notification issued on 16th November, 2009.	AAQ has been carried out as per notification issued on 16th November 2009.	Refer section 3.3.1 of Chapter 3 of EIA report
XXIX	Identify project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project. Discuss the effect of noise levels on nearby habitation during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic	The project construction activities will involve clearing and grubbing, trees cutting, site development works, road widening and strengthening, bypasses, construction of bridges, way side facilities, etc. The project activities proposed during construction phase are presented in Chapter 2 of EIA	



Sl. No.	TOR Points	Compliances	Remarks
	management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels should be done by using mathematical modeling at different representative locations.	<p>Report.</p> <p>The construction activities will have adverse impacts on the environment. Identification and assessment of anticipated environmental impacts have been carried out and presented in Chapter 4.</p>	
XXX	Examine the impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be carried out.	<p>The impact of the project road during the construction phase due to generation of dust emissions, air emissions from hot mix plants and vehicles used for transportation of materials are anticipated during construction phase.</p> <p>Prediction of impact on ambient air quality by CALINE - 4 mathematical model, using CPCB emission factors has been carried out and presented in Chapter 4.</p> <ul style="list-style-type: none"> • Hot mix plant will have in-built provision of pollution control equipment. • Hot mix plants will be installed in down wind direction minimum 1 km away from any populated area. • Hot mix plant will be installed with "Consent to Establish" and operated with "Consent to Operate" of State Pollution Control Boards. • All construction equipment and vehicles will be operated with pollution under control certificate. • Regular maintenance of vehicles and construction equipments, 	



Sl. No.	TOR Points	Compliances	Remarks
		<ul style="list-style-type: none"> • Water sprinkling will be carried out to control fugitive dust emission. • Regular monitoring of ambient air quality will be carried during construction and operation phase. 	
XXXI	Also examine and submit the details about the protection to existing habitations from dust, noise, odour etc. during construction stage. IRC guideline to be followed for traffic safety while passing through the habitat	<p>During construction and operation phases, following mitigation measures will be adopted to minimise impacts from dust, noise and odour :</p> <ul style="list-style-type: none"> • Sprinkling of water to suppress dust • Maintenance of vehicles and construction equipment's. • Use of silencers and mufflers, • Construction activities only during day time. • Collection of debris and waste and disposal as per standards practices. • Use of applicable IRC guidelines • Arrangement shall be done as per latest IRC guidelines 	
XXXII	If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump site along with necessary permission.	Some portion of the project road is existing alignment and maximum portion is new alignment which is to construct 4-lane bypass road for Srinagar. Maximum portion of the bypass falling in plain land and few km are in hilly section therefore, cutting and filling will be required. Disposal/dumping of materials are not required as quantity cut is less than the uses in earth filling.	If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump site along with necessary permission.



Sl. No.	TOR Points	Compliances	Remarks
XXXIII	If the proposed route is passing through low lying areas, details of fill materials and initial and final levels after filling above MSL, should be examined and submit.	The project is located in the J&K State which is about 1600m above MSL hence there is no low lying area with respect to sea level. However since the alignment is traversing through virgin land of Kashmir valley, care has been taken while designing the profile and average height of the embankment is 2.5m and FRL is about 3.5m above OGL.	
XXXIV	Examine and submit the water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity, and quality likely impacts on them due to the project.	Surface water sources viz., rivers, canals, drains, etc has been identified which has been enumerated in Table3.10	
XXXV	Examine and submit details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification.	About 860 million Liter water will be required for construction of the project road. Water for road construction will be taken from surface water bodies and partly from ground water resources. Public water sources and supply will not be used for road construction.	
XXXVI	Examine and submit the details of measures taken during constructions of bridges across river/canal/major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges. Provision of speed breakers, safety signals, service lanes and foot paths should be examined at appropriate locations throughout the proposed road to avoid the accidents.	<p>Following measures shall be taken during construction of bridges across the rivers, major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges:</p> <ul style="list-style-type: none"> • Slope stabilization on the banks of river/drains by turfing. • Provision of gabion mattresses and geotextile. • Provision of gabion retaining wall for river bank protection. • Scour protection measures 	Traffic safety measures to be taken are described in Chapter 2, Chapter 3 and Chapter 4 and Chapter 10 of EIA Report



Sl. No.	TOR Points	Compliances	Remarks
		<p>below the bridge.</p> <p>Traffic safety measures to be taken are described in Chapter 2, Chapter 3 and Chapter 4 of EIA Report.</p> <ul style="list-style-type: none"> • IRC guideline IRC: 103-1988 and other have been followed. <p>Safety signage, marking, zebra cross way will be provided.</p>	
XXXVII	If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.	No impact is anticipated on drainage along the project road.	
XXXVIII	Rain water harvesting pit should be at least 3 - 5 m. above the highest ground water table. Provision shall be made for oil and grease removal from surface runoff.	<p>Rainwater harvesting will be carried along the project road in plain and non-populated areas. Rain water harvesting pit shall be at least 3 to 5 m above the highest ground water table.</p> <p>Both side of the project road at the intervals of every 500m a rain water harvesting pit has provided</p> <p>Provision will be made for oil and grease removal from surface runoff</p>	
XXXIX	If there is a possibility that the construction/widening of road will cause impact such as destruction of forest, poaching, reductions in wetland areas, if so, examine the impact and submit details.	<p>No Such destruction will take place during construction works of proposed bypass. Only tree felling will involve in agriculture land.</p> <p>Hokerser Wetland and Mirgund Wetland located 215m and 195m respectively, away from the proposed alignment of Ring road/ Bypass.</p>	Refer Chapter-3 of EIA report.
XI	Submit the details of road safety, signage, and service roads, vehicular under passes, accident	IRC Guidelines (IRC: 67-2001) shall be strictly followed to provide road safety measures	Refer Chapter 2 of EIA report



Sl. No.	TOR Points	Compliances	Remarks
	prone zone and the mitigation measures.	<p>and signage along the project road.</p> <ul style="list-style-type: none"> • MS Crash Barriers on outer side of carriageway wherever the embankment height is more than 3m. • Junction Improvements carried out at all junctions. • Railings, elaborate road signs, road markings. • Blinker signals at all major intersections. • Speed breakers on all side roads. • Road studs and hazard markers / delineators at intersections and curves. • Highway ambulance patrolling during operation of project road. <p>For the safety of local people, pedestrian and cattle underpass have been provided.</p> <p>In populated areas, service road has been provided</p>	
XIi	IRC guidelines shall be followed for widening & upgradation of road.	IRC guidelines shall be followed during the construction of proposed bypass.	Refer Chapter-2 of EIA report
XIii	Submit details of social impact assessment due to the proposed construction of road.	For construction of proposed bypass, Social Impact Assessment has been presented in Chapter 7 of EIA report	Refer Chapter-7
XIiii	Examine road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.	The IRC codes followed for design of the project road are given in Chapter 2 of EIA Report. Safety Management for the project road is presented in Chapter 2 of EIA Report.	Chapter 2 and Chapter 10 of the EIA report



Sl. No.	TOR Points	Compliances	Remarks
XIiv	Accident data and geographic distribution should be reviewed and analyzed to predict and identify trends - in case of expansion of the existing highway and provide Post accident emergency assistance and medical care to accident victims.	<ul style="list-style-type: none"> This is a construction 4-lane new bypass for Srinagar so that all the work shall be carried out as per the existing IRC guidelines. During post construction phase, ambulances and first aid facilities will be available 'round the clock' at toll plaza and Trauma Centre. All the accident prone spots have been improved as per IRC standards. Safety units and cranes will be available round the clock at each location of toll plaza during operation period. 	
XIv	If the proposed project involves any land reclamation, details to be provided for which activity land to reclaim and the area of land to be reclaimed.	The project road will not require reclamation of land.	
XIvi	Details of the properties, houses, businesses etc. activities likely to be effected by land acquisition and their financial losses annually.	For the project road 378 hectares land will be acquired and 170 private structures 1, community/Govt structure and no religious structure (shrine/temple/Mosque) will be affected and compensated as per National Highways Act.	
XIvii	Detailed R&R plan with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the project specific.	The affected families will be compensated as per National Highway Act for the land property/residential property/ commercial property being acquired along with any immovable assets. No civil and housing amenities are being offered to affected families	Refer Chapter-7



Sl. No.	TOR Points	Compliances	Remarks
Xlviii	Submit details of Corporate Social Responsibility. Necessary provisions should be made in the budget.	<ul style="list-style-type: none"> • There is no provision of budget in this regard by PIU. However, during construction and operation phases, structures of the camps likely to be handed over to local authorities for education and health purpose apart from trauma centre and ambulance. • Local people will be deployed in construction and at toll plaza during operation phase. • Bus stands will be provided at villages along the project road. • Awareness for road safety in the settlements. HIV/ Aid awareness programme will be initiated	
Xlix	Estimated cost of the project including environmental monitoring cost and funding agencies, whether governmental or on the basis of BOT etc and provide details of budget provisions (capital & recurring) for the project specific R&R Plan.	Total estimated cost of the project is Rs. 923 crore. The environmental cost Rs. 8.99crore and R&R Cost Rs 8,68.9 crore	Refer Chapter-9 of EIA report
I	Submit environmental management and monitoring plan for all phases of the project viz. construction and operation.	Presented in chapter 6, chapter 9 and chapter 10 of the EIA report	Presented in chapter 6, chapter 9 and chapter 10 of the EIA report
Ii	Details of blasting if any, methodology / technique adopted, applicable regulations / permissions, timing of blasting, mitigation measures proposed keeping in view mating season of Wildlife.	No blasting is envisaged	
Iii	In case of river / creek crossing, details of the proposed bridges connecting on either banks, the design and traffic circulation at this junction with simulation studies.	The project road is crossing the major rivers/channel at three locations viz. Flood channel (5x33m) (back water of Jhelum river), Jhelum river 5x37m) and Gandharbal nallah	



Sl. No.	TOR Points	Compliances	Remarks
		3x30m). There is no problem with traffic circulation is envisaged. The alignment plan is enclosed	
Iiii	Details to ensure free flow of water in case the alignment passes through water bodies / river / streams etc.	The alignment is not crossing any water body. However it is crossing rivers/streams/channels. To ensure the free flow of water the linear waterway has been calculated based on the hydraulic calculation and compared with the existing structures on either side of the alignment. Nowhere the proposed length of opening is provided less than the existing structure. To ensure the free flow of water there are 3 major bridges, 27 minor bridges and 292 culverts have been proposed.	
Iiv	In case of bye passes, the details of access control from the nearby habitation/ habitation which may come up after the establishment of road.	The entire project road itself is a standalone bypass and is proposed as a partial access control bypass.	
Iv	Bridge design in eco sensitive area / mountains be examined keeping in view the rock classification hydrology etc.	The project road comes under seismic zone V and the design of structures will be done accordingly.	
Ivi	For any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website http://moef.nic.in/Manual/Highways .		
Ivii	In case of alignment passing through coastal zones	NA	

Chapter 4
Anticipated Impacts and Mitigation
Measures



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CHAPTER - 4: ANTICIPATED IMPACTS AND MITIGATION MEASURES

PART-1: ANTICIPATED IMPACTS

4.1 GENERAL

Proposed Srinagar Ring road/Bypass development will cause biophysical and socio-cultural impacts. The nature and magnitude of impacts vary depending on the character of components of construction works and the physical and socio-economic setting in which such project is located. Impacts have been assessed based on the information collected from the field surveys and additional secondary data collected as part of the study.

During the surveys, consultations and site investigations, a number of environmental issues were identified and discussed. For all the identified issues and potential impacts effective mitigation and avoidance measures were considered and included. During this process major and minor issues were classified as provided in the bellow table.

Identified environmental issues/and impacts

ROAD NAME	MAJOR ISSUES	OTHER ISSUES
NH-1A (Jammu Ring Road/Bypass)	<ul style="list-style-type: none"> • Cutting of Trees in non-forest area or private land • Water for construction • Loss of agricultural areas • Social impacts including land acquisition and resettlement • Impact to wildlife- traffic/wildlife conflict • Impact to religious properties • Longitudinal and cross drainage • Stabilization of slopes • Impact to religious properties 	<p>Operational phase impacts,</p> <p>Health and safety issues during construction and operational phases.</p>

The qualitative and quantitative assessment of bio-physical and socio-cultural environmental components can be direct or indirect and such impacts are described in the following sections and mitigation measures proposed are presented in second part of this chapter.

4.1.1 Impacts on Physical Environment

4.1.1.1 Impact on Meteorology

The baseline study reveals that the project will involves removal of about 17929 trees within the ROW of the proposed project road. Removal of trees will result in temporary loss of shade for some areas causing some discomfort for local people. The paving of surfaces will also lead to very minor changes in temperature. However with the provision of grass turf on the embankment and restoration of the vegetal cover through compensatory afforestation there will be minimal impacts on the micro-meteorology of the project impact corridor.

4.1.1.2 Impact on Physiography

The project is passes through plain terrain, except few hill locations. There will be little cut and fill operations as embankment is not being raised along the proposed Srinagar bypass except at VUP locations (8 nos.) where it is proposed to raise. However the storage of materials at identified sites may cause very minimal changes in Physiography



only for a temporary period. The impact therefore on the corridor will be very low and insignificant.

4.1.1.3 Impact on Topography

The overall topography of the area in vicinity the project road is slightly going to be impacted in terms of change in land use.

4.1.1.4 Impact on Geology

The project area falls in sub-mountainous region at the foothills of the Himalayas, which is very fragile and vulnerable to landslides and earthquakes. Keeping in view the fragility and seismicity of the project area, the collection and transportation of material may be allowed from the identified quarries and borrow pits only, which would cause very insignificant impact on the geology of the project corridor.

4.1.2 Impact on soil

4.1.2.1 Loss of productive Soil

The development of the proposed Srinagar Ring road/Bypass around the Srinagar city will require diversion of agricultural and private land. There is a slight change in land use and therefore the impact on agriculture production will be very low. This is also not going to have an adverse impact on the hydrology of the project corridor. There may be temporary loss of production during construction stage if workers camps, stockyards and borrow areas are established on agricultural land. Use of some lands for haul loads and traffic detours may cause minimal and temporary impact on productivity of the project corridor.

4.1.2.2 Soil Erosion

Pre-Construction Stage

Site clearance and cutting of trees may set the process of soil erosion.

Construction Stage

The project road will not be elevated sections of embankment. However on approaches to the VUP the embankments will be higher from ground level. During construction if proper drainage is not maintained then soil erosion process may be set in.

Operation Stage

Slope embankments will be provided with the grass turf and run off from the project road shall be safely disposed off to the existing drainage system to prevent any possibility of soil erosion. The vegetal cover that will come up through compensatory afforestation will also hold the soil firmly through their root system and also by cutting down on quantum of precipitation reaching the ground through canopy interceptions and evaporation through canopy foliage.

4.1.3 Contamination of Soil

Construction Stage

Soil contamination may take place in the construction stage through construction of labour-camps; stockyards and construction of camping sites for parking of construction machinery equipment, movement of construction machinery, vehicles during construction especially haul roads. Sub soil contamination may also be attributed to:

- Scarified bitumen wastes



- Maintenance of the machinery and operation of the diesel generator sets on site
- Oil Spill from the operation of the mechanical workshops, diesel pumps and diesel storage, during transportation and transfer, parking places, and diesel generator sets
- Operation of the emulsion sprayer and laying of hot mix
- Operation of the residential facilities for the labour and staff
- Storage and stock yards of bitumen and emulsion
- Excess production of hot mix and rejected materials

Operation Stage

During this stage there is possibility of soil contamination by spills from accidents or leakage from vehicles carrying hazardous chemicals. The probability of incidents is low and such impacts will depend to a great extent on how such situations are handled on ground.

4.1.4 Impact of Soil Borrow Areas

Extraction of materials from soil borrow areas can result in direct or indirect impact on local environment. The earth will be taken from borrow areas which may result in loss of productive soil, Change in topography.

4.1.5 Impact on Water Resources

Due to the proposed project there will be some impacts on the water resources. The typical impacts on water resources and indicators of the impacts during the construction and operation stage of the project are given below in the **Table 4.1**.

Table 4.1: Impacts on Water Resources and Indicators

Water Resources	Indicators
Surface Water Bodies	Water quality degradation, Siltation
Ground Water Sources	Loss of tube wells and wells
Alteration of drainage, lack of adequate drainage	Overtopping, flooding, water logging
Depletion of ground water	Increase in Ground water level

Impact on Surface Water body

During the baseline survey it is estimated that the all the three alignment will be traversing project road is crossing 2 rivers (Shaliganga and Jhelum river), around 103 streams / canals/nallahs. These surface water bodies may be impacted in terms of degradation in water quality and increase in sediment load during construction if EMP recommendation will not be followed.

Pre-construction stage

Water resources can get impacted through increase in sediment load arising out of stripping of ground and tree vegetation for establishment of workers camps, stock yards for materials, camping grounds for equipment etc. Such impacts will be short term and largely mitigate through management measures. Temporary increase in turbidity may also temporarily affect aquatic flora and fauna resulting in their migration to safer stretches of surface water.



Construction Stage

During the baseline survey it is estimated that the all the three alignment will be traversing through 2 rivers (Shaliganga and Jhelum river), around 103 streams / canals/nallahs. The water quality of these surface water bodies may degrade due to falling of construction materials, spoils or inflow of silt because of soil erosion along the bank / embankments of canal/ drain/ minor/ distributary during construction stages. The storage of materials and construction wastes may also add to such sediment load. The construction activities on this live canal will be carried out when there will be no flow of water which will result in disruption of water supply to the downstream user. The sources of water pollution from the construction activities include the following:

- Storage and stockyards of bitumen and emulsion.
- Oil spill from the operation of the mechanical workshop, diesel pumps, diesel storage, transportation and transfer
- From the foundation work of bridges and culverts such as piling and excavation for open / well foundation
- Operation of construction camps
- Water flow from scarified bitumen material
- Operation of emulsion sprayer and laying of hot-mix.

There will be increased surface run-off because of construction of new pavements resulting in sealing off a substantial permeable surface and removal of vegetation cover leading to loss of evapotranspiration and increased through-fall. Increased through-fall may to some extent negate the impact of sealing particularly in areas where the vegetal cover exists currently.

Operation Stage

There is very little chance of deterioration in water quality in this stage. This may happen only in case of accidental spills. As all safety measures will become operative during the operation phase there is very less probability of such incidents

4.1.5.1 Impact on Ground water

The development of Ring Road/Bypass will also affect the ground water sources viz., 5 hand Pumps,. The loss of these hand pumps will be a loss to the communities, which have been using these as water resources. The water will be extracted from irrigation canal/ ground water for construction activity after permission from concerned authority but total water required for domestic use in labour camp will be utilized from ground water. Since this demand is spread during the construction period only, so no major impact is anticipated.

4.1.5.2 Alteration of Cross Drainage

Such changes can be attributed to the construction of new bridges. The construction activities may result in obstruction to flow.

4.1.5.3 Increased Surface Run-off

Provision of wide paved shoulders on both side of the proposed project Ring Road/Bypass and construction of 2x2 lanes highway, will result in increase in run-off quantum through reduction in water infiltration. The increase paved area is not being significant, and will not have any major impact on the ground water table.



4.1.6 Impacts on Air Environment

Pre-construction Stage

The pre-construction stage is characterized by activities like site clearance, tree cover removal, shifting of utilities, transportation of men and material, establishment of construction camps, stockyards, installation of plants and equipment. All these activities lead to generation of dust especially when such activities are undertaken during the dry season. Such impacts are Short-term, location specific temporary and reversible.

Construction Stage

The most important pollutant during this phase will be suspended particulate matter along with gaseous pollutants like dioxides of nitrogen, sulphur, and carbon monoxide. Such deterioration of air quality can be assigned to:

- Fugitive dust emission from construction activities like excavation, back-filling and concreting
- Hauling and dumping of earth & construction spoils and vehicular movement along unpaved roads or temporary diversions
- Gaseous emission from construction equipment and vehicular traffic
- Emissions from asphalt and hot-mix plants

Such impacts will be felt locally as well as along the project road particularly at the sites of bridge construction and the spans of the project taken up for rehabilitation.

Generation of Dust

Dust generation due to procurement and transport of raw materials from quarries and borrow pits, site clearance, use of heavy vehicles, machinery/ equipment, stone crushing handling and storage of aggregates and generation of fine particulate matter (smoke) in asphalt processing will be responsible for short-term and localized degradation of air quality.

Generation of Exhaust Gases

Hot mix plants contribute substantially to the deterioration of air quality due to emissions of oxides of sulphur, hydrocarbons and particulate matter. During operation phase, due to the increased speed and volumes of vehicular traffic on the project corridor, marginal increase in the air pollutant levels, is expected but not significant.

Operation Stage

This stage is characterized by increased intensity of vehicular movement because of improved connectivity thereby increasing pollution load. The impacts of oxides of nitrogen, carbon monoxide, and respirable particulate matter will increase with the increasing number of vehicles using this project road. Such impacts will be of long term and will be felt within a corridor width of 75m -100m on both sides from the edges of the project road. The abrasive action of tyres will also add to degradation in air quality.

4.1.7 Noise environment

Pre-Construction stage

The noise levels may increase due to pre construction activities like establishment of workers' camps, movement of construction materials and movement of machineries and equipments for construction. This impact of increased noise level will be localized, short-term and reversible.



Construction Stage

Impacts during this stage are going to be significant for the communities residing along the project corridor. Impacts on different receptors will also vary considerably during the construction stage and these impacts will be localized and limited to stretches where construction work will be under progress, near Equipment / vehicle yard, Plant sites. The machineries and equipment used in construction during their operation add significantly to the noise level. Proper scheduling of operation of such machineries during the construction phase may to a great extent attenuate the noise level leading to lessening of the discomfort level of the affected communities. Other activities related to construction that affect noise quality include stone crushing, asphalt production and batching plants and diesel generators.

Operation Stage

During operation stage noise levels will slightly decrease due to traffic decongestion of traffic on this project road. Noise will be mitigated by planting trees along the project road as noise barrier.

Typical noise level of construction equipments is provided in **Table 4.2**.

**Table 4.2: Typical noise levels of principal construction equipments
(Noise Level in db (A) at 50 Feet)**

Clearing		Structure construction	
Bulldozer	80	Crane	75-77
Front end loader	72-84	Welding generator	71-82
Jack hammer	81-98	Concrete mixer	74-88
Crane with ball	75-87	Concrete pump	81-84
		Concrete vibrator	76
Excavation and Earth Moving		Air compressor	74-87
Bulldozer	80	Pneumatic tools	81-98
Backhoe	72-93	Bulldozer	80
Front end loader	72-84	Cement and dump trucks	83-94
Dump truck	83-94	Front end loader	72-84
Jack hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
Grading and Compaction		Landscaping and clean-up	
Grader	80-93	Bulldozer	80
Roller	73-75	Backhoe	72-93
		Truck	83-94
Paving		Front and end loader	72-84
Paver	86-88	Dump truck	83-94
Truck	83-94	Paver	86-88
Tamper	74-77	Dump truck	83-94

Source: U.S. Environmental Protection Agency, noise from Construction

Equipment and Operations. Building Equipment and Home Appliance. NJID. 300.1. December 31st,1971.

The noise levels indicated for various construction activities/ equipments, though far in excess of the permissible standards, due to their intermittent nature, the impact of increased noise levels would only be temporary. Even so, the extremely high sound levels present a risk to the workers on the site.



In general, it is evident that the impact of road-related noise is highest when the road passes through densely populated areas, town ships and markets, and when there is a traffic bottleneck (or a high mix of slow and fast moving vehicles) or when the speed of traffic stream is low and idling of vehicles. Since this project is a new alignment and most of the part of the project road will be crossing through the green field areas so there will be very few chances of road-related noise in the densely populated build up areas.

4.1.8 Impact on Ecological Resources

Flora

Pre-Construction Stage

Some trees and ground vegetation will be impacted through establishment of construction workers' camps, stockyards for material storage and construction machinery and equipment camps. Such impacts will be temporary and reversible.

An estimated 17929 trees mainly popular plantations shall be affected in agriculture land, due to the development of the proposed Ring Road/Bypass.

Construction Stage

The impact will be significant at this stage, as the tree cover within the proposed ROW will be removed in phases as the project road work progresses. This will affect the aesthetics of the corridor. Some of those were available for the communities like shade, fruits, flowers and dry fuel wood from the branches will stop flowing to such communities. This denial will persist for a significant period, as the compensatory vegetation will get established over a time -frame of 7 to 10 yrs. The loss of vegetal cover will also result in higher run-off because of absence of canopy cover of trees.

Operation Stage

There will be only beneficial impact during this stage. With the removal of causative factors the ground vegetation will reappear in areas not sealed off during the construction process as most of these species are colonizers. Strip plantations will be raised along the stretch of the project road and this will cover a much larger area. The composition of such plantations will also be designed in such a manner so as to make usufructs available to the communities that will be lost during the process of execution of the project.

Fauna

The field survey and interviews conducted during preliminary survey did not indicate presence of any rare and endangered wildlife except Nilgai, Barking Deer, Wild Boar, Rhesus Monkey etc. and avifaunal species Indian Mynah, Blue Rock Pigeon, Peafowl, Red Jungle Fowl, Jungle Crow, White Cheeked Bulbul etc. on/near the project road. No Wild Life Sanctuaries/ National Park, located within the 10km radius of the project road. Only two Wetland namely Hokerser wetland and Mirgund wetland exists within the radius of the project road. It can be concluded that the project will not have any adverse impact on the wild fauna component of the project corridor.

4.1.9 Impact on Socio -Economic Environment

The development of proposed Srinagar Ring Road/Bypass will in general have beneficial impact on socio- economic front both locally and regionally through improved better and safer connectivity of the project area with markets located in the state adjoining areas. But there will be also some adverse impacts resulting from



- i. Resettlement of People
- ii. Relocation of community structures
- iii. Acquisition of land and structures
- iv. Influx of Construction Workers
- v. Economic Impacts

4.1.10 Impact on Safety and Public Health Road Safety

Construction Stage

Communities inhabiting the area of impact corridor will obviously bear the brunt of discomforts arising out of increasing pollution load during the construction stage. There will also be some concern for them as far as safety measures are concerned. Such levels of discomfort can be reduced with proper planning and rotation of work in different stretches of the road. However, special attention will be given while organizing construction work particularly in and around minor and major settlements along the project road. The impacts can be classified as:

- Psychological impacts of project affected people
- Migration of workers and siting of construction camps may lead to problems of sanitation. This might also lead to transmission of communicable diseases
- Discomforts arising due to air and noise pollution.

Operation Stage

The operation stage will obviously envisage both negative and positive impacts. Positive impacts will arise from increase width of pavement on road way, more effective cross and lateral drainage and increasing safety measures at areas of urbanization. The negative impact will ensue arise from movement of large number of vehicles and generation of dust in the area wherever present there is least traffic movement which are negligible. Installation of proper road safety system through signage, barricades, crash barriers, edge posts / parapets will add to be safety of the vehicular traffic on the stretch of the road. It may also be necessary to properly designate areas for cross over by pedestrians, school children and cattle. All these factors are likely to cumulatively lead to better safety of the road users and local inhabitants.



PART-2: MITIGATION, AVOIDANCE AND ENHANCEMENT MEASURES

4.2.1 Overview

Any infrastructure development work is likely to bring in both adverse and beneficial impacts on biophysical, socio-cultural environment of a particular. It needs to be consciously pursued to devise measures to mitigate adverse impacts if it is not possible to avoid it. Management measures may to a great extent help in reducing the magnitude on such impacts and to keep them at acceptable levels keeping in view the long term sustainable development of a region on sound environmental considerations.

Highway/road projects particularly bring in adverse impacts on pollution load of different environmental parameters like soil, water, air, noise, and ecological resources. There will also be impact on the socio- economic parameters of the locality resulting in displacement / dislocation / relocation for people and properties. This may also impact sensitive areas as far as conservation of biological resources of a particular area is concerned. Cultural properties / heritage sites may also be affected by such project execution. However, the impacts resulting from the project have been discussed in details in the preceding chapter and the present chapter deals with mitigation, management and enhancement measures of different components of the environment impacted by this project.

4.2.2 Meteorological Parameters

Whatever the little impact will be on the climate at micro level will be mitigated by way of compensatory afforestation on double the land to be diverted and new avenue plantations to be done at the stretches where tree covers do not exist. The tree removal resulting in loss of shade in locality is also a temporary negative impact; such impacts will disappear with the restoration of vegetal cover over a much larger area.

Thus the proposed ring road/ bypass will be a relatively localized activity, which implies that the road development will not have any significant impact on climatic condition of the project area.

The localized short-term adverse impacts will be offset by compensatory afforestation of vegetation and tree plantation. No other specific mitigation measures are proposed for off-setting adverse impacts on the climate in the project area.

4.2.3 Topography

During construction phase following restrictions should be imposed to mitigate the impact on topography:

- i. Existing vegetation including shrubs and grasses along the proposed Ring Road/Bypass (except within the strip directly under embankment or cutting) will be properly maintained during construction phase,
- ii. Quarrying, borrowing and disposal of spoils will conform to applicable laws and regulations in India (including practice followed in recent/ongoing internationally funded road projects in India)
- iii. Cutting and felling will be balanced in agriculture area.



4.2.4 Geology and Soil

4.2.4.1 Soil Erosion Control

For most of the Proposed Ring Road/Bypass stretches land level is plain/flat except the foot hill section where hill cutting and filling will be done to construct the proposed Srinagar Bypass, which may result to rill and sheet erosion. The problem of soil erosion during the construction stage is likely to be more pronounced along bridge/VUP-end fills, over steep banks and embankment slopes. To check soil erosion on critical road embankment slopes turfing with shrubs and grasses will be carried out, in accordance with the recommended practice for treatment of embankment slopes for erosion control. Soil erosion checking measures as the formation of sediment basins, slope drains, etc., will be carried out at construction sites. Proper side drains for the storm water from the road will be constructed so as to avoid pooling of water near toe line of the road and combination of water bodies

Grass turfing of exposed slopes will also reduce possibilities of erosion. Construction of embankments in bridge approaches may be organized in dry season to avoid erosion process setting in high embankment on bridge approaches. Grass turfing will be taken up as practice provided in IRC: 56-1974. Apron and approaches of bridges and cross drainage structures will be paved with suitable paving materials for prevention of erosion during heavy rains.

Control of soil erosion will also include;

- To place control measures in position for prevention of sedimentation by surface run-off during the monsoon
- Sitting storage yards of excavated materials with protection measure to prevent their movement.

4.2.4.2 Soil Contamination

Such contamination may occur because of leakage of fuel, lubricants, waste oils, bitumen, emulsion etc. for the construction and allied activities but by nature this impact will be localized.

At the various construction sites, the vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. It will be ensured that the fuel storage and refueling sites are kept away from drainage channels and important water bodies.

Construction Stage

Control measures will include:

- Stripping and preservation of topsoil of Borrow areas, land acquired for temporary diversion during construction,
- Restricting the movement of Heavy machinery and construction vehicles on productive land.
- Refueling, Change of lubricants / oil and repairing to be carried at designated places provided cemented platform and oil interceptors.
- Construction of sump and provision of an impervious concrete base at all fuel, waste oil, bitumen, emulsion etc storage yards
- Use of non-toxic wastes in the project as far as possible



- Measures for minimization of waste and proper collection, storage, of all solid and liquid wastes generated
- Provision of concrete platforms at parking bays
- Construction of washing bays with interceptor and use of oil trays for collection of oil spills during emergency repairs at site
- Restoration of borrows areas and land used for temporary diversion by laying topsoil.

Operation Stage

Impacts are anticipated only in case of accidents involving large spills of hazardous materials and petroleum products. This will require to be handled through the local authorities installed for disaster management.

4.2.4.3 Compaction of Soil

To prevent the compaction of soil and the trampling of the vegetation around the construction sites and temporary access roads, it will be ensured that the construction machinery and equipment will move, or be stationed in the designated area. If the equipment and machinery are operating on temporarily hired land, it will be ensured that the topsoil for agriculture remains preserved and not destroyed by storage, material handling or any other construction related activities. To minimize compaction of soil, all the vehicles will as far as possible, follow per-designated routes.

4.2.4.4 Management of Soil Borrow Areas and Quarries

The quarry material will be obtained from licensed quarries, which operate with proper environmental clearances, including NOC under the Air Act. If the contractors decide to use quarries other quarries, they would be required to obtain material from licensed quarries only.

For the borrowing of earth for the project, borrow area locations will be identified and recommended. However, in case of any new borrow area being selected by the contractor, it will be ensured that no earth will be borrowed from within the ROW. If new borrow areas are selected, it will be ensured by the contractor that, there will be no loss of productive soil, and that the requisite environmental considerations are met with.

To avoid any embankment slippages, the borrow areas will not be dug continuously, and the size and shape of borrow pits will be decided by the Supervision Consultants. The borrow pits will be redeveloped, wherever required by creating ponds for fisheries, etc; or by leveling an elevated, raised earth mound. If this is not possible, then excavation slopes will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. Re-plantation of trees in borrows areas will also to be carried out, if required.

Precautionary measures as the covering of vehicles will be taken to avoid spillage during transport of borrow materials. To ensure that the spills likely to result from the transport of borrow and quarry materials do not impact the settlements, it will be ensured that the excavation and carrying of earth will be done during day time only. The unpaved surfaces used for the haulage of borrow materials will be maintained properly.



Mitigation for Quarries:

The following mitigation measures will be implemented.

- Aggregates will be sourced only from the licensed quarry sites, complying with the environmental and other applicable regulations,
- Occupational Safety procedures/practices for the work force will be adhered in all quarries as per law,
- Quarry and crushing units will have adequate dust suppression measures like sprinkler in work area and along approach road to quarry site,
- Regular monitoring of the quarries by the supervision consultant to ensure compliances of environmental management and monitoring,
- Water tankers with suitable sprinkling system will be deployed along the haulage roads. Water will be sprinkled regularly to suppress the airborne dust due to the dumper/truck movement. Required frequency will be determined by the site condition.
- Trucks deployed for the material transportation will be spillage proof.

Mitigation of Borrow Areas:

Impact due to borrowing soil can be significantly mitigated by the following measures:

- Prior approval will be issued from the concerned authorities and all local environmental regulations will be complied,
- Within all identified borrow areas, the actual extent of area zones to be excavated will be demarcated with signboards and the operational area will be access controlled,
- Borrow operation plant and machineries will strictly conform to Central Pollution Control Board (CPCB) noise standards;
- Provision of protective wears like earplugs will be made available to the workforce exposed to noise level beyond the threshold limits. Rotation of personnel will be ensured.
- All operation area will be water sprinkled to control dust levels to the National Ambient Air Quality Standards.

Opening and management of borrow areas be done as per Guidelines 5 Borrow Area Management and Clause 111 of Road and Bridge specification of MoRT&H. The borrow to the extent possible will not be opened in Agricultural field, In Right of way and loss of vegetation should be minimum. Borrow areas should be rehabilitated as per agreement and in line with measures detailed in Guidelines V for Borrow Area management.

4.2.5 Loss of Agriculture Land

Around 63.92% length of the proposed Srinagar Bypass passes through cultivated land; 18.91% length traverses through barren/govt areas and 12.71% is orchard and 4.45% length passing through habitation area. The acquisition of agriculture land will result little impact on agricultural production of the project area due to change in land use pattern. All the affected persons will be compensated as per the R & R policy.



4.2.6 Water Environment

4.2.6.1 Impact on Surface Water Bodies

The project involves construction there will be 3 nos. of major bridges, 28 nos. minor bridges and 291 nos. culverts are proposed in the project road.

Potential mitigation measures to protect water quality will include:

- Use of sediment traps and minimization of soil movement
- Use of oil/ water separators to extract floating oils.
- Channeling run-off with high level of suspended solids into sedimentation ponds.
- Proper storage of contaminated liquids and disposal after treatment to bring such liquids within prescribed permissible limits.
- Turing with grass or planting with tress of all exposed areas as soon as possible to reduce erosion risks.
- Restricting construction activities near water bodies or canals as far possible during the dry season.
- On site fueling area of vehicles and equipments will be selected away from water bodies and should be protected by a berm to prevent run-off leaving the area.
- Construction material handling procedures e.g. storage away from water sources and provision of retention areas to contain accidental spills of such toxic, hazardous and
- Harmful construction materials like asphalt, oil and petroleum products will be prepared and applied.

Working within Water Courses

All precautions will be taken to prevent blockage of water channels during excavation, foundation, piling works and construction of diversions. Such precautions will include:

- Construction work for irrigation canals will be taken up only after due consultation with stake holders
- Works will be planned in a manner so as to avoid taking up foundation works during monsoon. Such works will be scheduled for completion during the dry season.
- All spoils and debris generated during construction shall be cleaned up quickly and regularly.
- Bentonite slurry pits will be located away from canals and after completion of piling works such slurry pits will be disposed off away from the watercourse.

Disruption to Water Users

During construction while working on live irrigation canals flow may require to be stopped. In such eventuality contractor has to inform all the downstream users well in advance about the duration of disruption in water and this will be done in consultation with the downstream users. The construction schedule on these canals is such that flow of water is not disrupted during peak irrigation canal.



Ground Water Resources

The impacted tube wells bore wells and hand pumps during the development of Ring Road will be compensated. Further, Corridor of Impact will also be suitably compensated.

4.2.7 Air Environment

Construction Stage

The Construction activities are primary responsible for dust generation whereas the operation of the plant and machineries are responsible for emission of gaseous pollutants. The dust dispersion can be controlled through dust suppression methods of sprinkling of water at regular intervals. As far as gaseous pollutants from construction plant and machinery are concerned, this can be kept under control through adoption of following measures:

- Vehicles delivering fine materials like soil and fine aggregates shall be covered to avoid/reduce spills on existing roads.
- Batch type hot mix plants fitted with the bag filter / cyclone and scrubber will be installed for the reduction of the air pollution.
- Pollution control systems like water sprinkling and dust extractors and cover on conveyors will be installed for the crushers.
- All vehicles, equipment and machinery used for construction will be regularly maintained to ensure that the emission levels conform to the SPCB/CPCB norms.
- Air pollution monitoring plan has been delineated for construction phase separately for checking the effectiveness of the mitigation measures adopted during the construction phase of the Contract.
- Asphalt and hot mix plants will be located at least 1000 m away from settlements and 300m from the road.

Plantation of pollution resistant species like *Azadirachta indica*, *Ficus bengalensis*, *Albizia lebbek*, *Polyalthia longifolia* etc while replacing the strip plantation may help in attenuating pollution load of gases and particulate matter.

Operation Stage

Because of smooth traffic on improved surface roads the vehicular pollution is likely to improve. However, such beneficial impact may also be negated by substantial rise in density of vehicular traffic at this stage because of improved connectivity of the region and resulting induced development. To minimize impact during this particular stage, it also will be necessary to avoid ribbon development along the road stretch. Strict monitoring of emission norms of vehicles on this road need be enforced for appreciation of the beneficial impact. Monitoring of the air pollution levels has been proposed in this stage to keep pollution levels within the prescribed limits of CPCB / SPCB.

Table 4.3 presents a comparative account of the sources of air pollution, their impact and mitigation measures planned as given below.


Table 4.3: Sources of Air Pollution, Impacts and Suggested Mitigation Measures

Sl. No.	Sources of Air Pollution	Impacts	Suggested Mitigation Measures
1.	<ul style="list-style-type: none"> • Cutting of slopes for Construction of road; • Transportation and tipping of cut material; • Soil erosion • Transportation of raw materials from quarries and borrow sites; • Stone crushing, handling and storage of aggregates in the asphalt plants; • Site leveling, clearing of trees, laying of asphalt, construction of bridges; • Asphalt mix plants due to mixing of aggregates with bitumen 	Generation of Dust (SPM)	<ul style="list-style-type: none"> • To ensure that crushers, batching plants and asphalt plants all are located at a distance of 500 m away in the downwind direction from the nearest human settlement; • To ensure that all precautions shall be taken to reduce the level of dust emissions from crushers, batching and asphalt plants and from transportation of other materials; • Provision of wind breaking wall around the sources of dust such as vibrating screens, conveyors, etc. should be made and regularly checked for all stone crushers used to supply material for the project; • Vehicles delivering loose and fine materials like crusher dust and soil/spoils shall be covered to reduce spills on existing roads; • The hot mix plant will be fitted with dust extraction units; • Water will be sprayed on earthworks, temporary haulage and detour roads on a regular basis. During and after compaction of the sub-grade, water will be sprayed at regular intervals to prevent dust generation; • It shall be ensured that the dust emissions from the vibrating screen and crusher at the stone quarries do not exceed the emission standards set by CPCB; and • Monthly monitoring shall be conducted at locations where earthworks or slope cutting operations shall be conducted. • An adequate cyclone/scrubber to control emissions from the stock of hot mix plants will need to be provided in the event of emissions exceeding the CPCB norms;
2.	<ul style="list-style-type: none"> • Hot mix plants; • Large construction equipment trucks and asphalt producing and paving equipment; 	Generation of polluting gases including SO ₂ , NO _x and HC	<ul style="list-style-type: none"> • All vehicles, equipment and machinery used for construction work shall be regularly maintained to ensure that the pollution emission levels conform to the CPCB norms; and • To ensure the efficiency of the mitigation measures suggested, air quality monitoring shall be carried



Sl. No.	Sources of Air Pollution	Impacts	Suggested Mitigation Measures
	<ul style="list-style-type: none"> • Movement of heavy machinery, oil tankers etc. on steep slopes shall relatively contribute towards higher emissions of gases; • Toxic gases released through the heating process during bitumen 		<p>out at least once a month at all these locations to check as to whether the emission levels are within the norms as prescribed by CPCB.</p>

4.2.8 Noise Environment

Construction Stage

During construction stage, noise and vibration will be significant particularly in the busy intersections and near settlements. Mitigation of disturbing noise level will be achieved through following measures:

- All construction equipments and vehicles should be maintained in good working condition to keep their noise level within permissible limit of CPCB/SPCB standards
- Construction camp and temporary labour sheds will be located away from the vicinity of construction site and major traffic areas.
- Stationary construction equipments will be placed at a minimum distance of 300 m. from settlements and silence zones.
- Construction activities in settlements and nearby areas will be scheduled to be carried out during the hours of the day to cause minimum discomfort to community.

Operation Stage

With the improvement of road surface after rehabilitation noise level is likely to get attenuated in the initial years after commission. But over a period of time the increased vehicular traffic along the stretch of road may negate such beneficial impact. The proposed raising of tree cover along the sides of road embankment and toe with the right mix of small, medium and tall trees is likely to attenuate noise level to acceptable limits.

4.2.9 Construction Camp

The following criteria will guide the establishment of labour camps, offices and construction plat sites:

- These will be located at a distance of 1000m away from any major settlement or village
- These will never be located at a distance of less than 1000m from surface water sources.



Some principles as laid down here in below should be adhered to in management of these camps:

- Such camps should always be provided with a proper fence or a boundary wall.
- There should be restriction on the movement of workers from the camps particularly during the hours of the light.
- Plant and machinery operation should be restricted between the hours of 6 am to 9 pm.

Under the proposed development the noise levels will be much more pronounced during construction stage particularly around settlements and in inhabited areas. Mitigation measures as listed in **Table 4.4** shall therefore be adopted for mitigating noise levels.

Table 4.4: Sources of Noise Pollution, Impacts and Suggested Mitigation Measures

Source of Noise Pollution	Impacts	Suggested Mitigation Measures
Mobilization of heavy construction machinery; Acceleration/deceleration/gear changes by the vehicles depending on the level of congestion and smoothness of road surface; Excavation for foundations and grading of the site; Construction of structures and facilities; Crushing plants, asphalt production plants; and Loading, transportation and unloading of construction materials.	Increased Noise Levels causing discomfort to local residents and workers	All construction equipment, plants, machinery and vehicles will follow prescribed noise standards. All construction equipment used for an 8 hour shift shall conform to a standard of less than 90 dB (A); At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10.00 PM and 6.00 AM; Vehicles and construction machinery shall be monitored regularly with particular attention to silencers and mufflers to maintain noise levels to minimum; Workers in the vicinity of high noise levels must wear ear plugs, helmets and should be engaged in diversified activities to prevent prolonged exposure to noise levels of more than 90 dB (A) per 8 hour shift; Hot mix plant, batching or aggregate plants shall not be located within 500 m of sensitive land use as schools, hospitals etc; At critical locations, especially along sensitive receptors such as hospitals and schools, noise barrier walls and mounds of various materials such as earth, concrete, wood, metal or double glazing of windows for façade insulation shall be used.



4.2.9.1 Facilities at workers camps

Workers camps should be provided with facilities like sanitation, shelter, canteen, health care and day crèche.

4.2.10 Ecology

Flora

The impact has been proposed to be mitigated through planting at least 3 times the number of trees removed or as per instruction of state forest department. This department generally consults stakeholders while deciding on the species mix and the pattern of planting in such afforestation projects. Sprinkling of some fruit bearing and flowering species in this afforestation plan will enrich this region with a variety of birds in addition to restoration of all associated benefits to the community that were lost to them during construction stage through the removal of vegetal cover.

Local grasses, shrubs, and herbs will generally reappear in all blank/barren patches in the project corridor during the operation stage, as most of these species are pioneer colonizing ones.

Fauna

- Primary Field visits don't indicate the presence of any wild animal on / near the project road except Nilgai, Musk Deer, Wild Boar, Monkey etc. and avifaunal species such as Indian Mynah, Cheer Pheasant, Peafowl, Red Jungle Fowl, Jungle Crow, Golden Oriole, White Cheeked Bulbul etc.
- No Sanctuary are situated in the project district, and located within the 10km radius of the project area..
- Suitable no. of cross drainage structure and cattle underpass shall be provided for easy movement of wildlife animals from one parts of the road to other parts.
- Road Safety signage like No pressure horn, Slow Drive, Wild Life Area shall be displayed on the road.
- Dense vegetation shall be grown within the ROW of Ring Road/bypasses to reduce the noise intensity.
- Hokerser wetland (215m) and Mirgund wetland (195m) located 10km. radius of the project.

4.2.11 Cultural Environment

The loss of any cultural property cannot be compensated in monetary terms but the cost of such relocation has been provided in the RAP. The impact of private property is very minimal and a suitable compensation package has been designed in the RAP to compensate for the loss / relocation of such properties. As far as the Project Affected Households and the Project Affected Families are concerned, a suitable package for compensating their losses has been provided in the Resettlement Action Plan (RAP).

4.2.12 Road Safety

Design Stage

Safety of road users, particularly pedestrians, has given due consideration at this particular stage. Both sides of the highway will have pavements for use by pedestrians. In addition to this keeping view the safety of vehicular traffic on approaches to bridges the road is being constructed into 2x2lane.



Construction Stage

For provision of required safety precaution traffic management plan will be prepared and implemented during construction in accordance of IRC: SP: 55 (Guidelines on Safety in Road Construction Zones). During the process of construction bridges over the canals appropriate route diversion signage and management of traffic detours will be implemented.

4.2.12.1 Health/ Safety Measures for Labours

First Aid boxes with first aid leaflets will be placed at all work places and at least four sets in the each construction camp. Some of the workers will be given first aid training to treat some of the emergencies at the working zones and at auxiliary sites. Arrangements with nearby health centers and local doctors will be made for treating injuries, which needs attention of specialist doctors. During the construction phase, workers will be provided personal protective equipments based on the nature of the work. Personal protective equipment will include:

- Safety glasses for protection of eyes
- Face Shields and Masks for protection of face and nose
- Helmets and Safety shoes for protection of Head and Feet
- Gloves, Vests and Earplugs for protection of Hand/Arms, Bodies and Hearing

4.2.12.2 Traffic Safety Plans

Construction Stage

All required safety precautions and traffic management plans will be prepared and implemented during construction in accordance with the IRC: SP: 55 (Guidelines of Safety in road construction zones) will be followed. There will be conscious effort to ensure that the road users and the communities near the work site suffer minimal discomfort during the construction phase of different stretches of the road. A suitable Traffic Management Plan will be prepared especially for construction sites and bridge locations and their approaches.

4.2.13 Seismicity

Nature and magnitude of proposed work, does not create any seismicity hence no mitigation measures required.

4.2.14 Enhancement Measures

In accordance with EIA operative directives additional positive actions need be encouraged is a part of EA process apart from remedial mitigation measures that have been proposed to adjust the negative impact during the project. Such environment enhancements are undertaken with the specific purpose of giving benefits to the road users and communities living along the project road. Such gestures bring a lot of goodwill from the local communities and this helps to rally support of the stakeholders in execution of the project in the fixed time frame.

4.2.14.1 Objectives

Following are the objectives of the environmental enhancement measures:

- To enhance the environmental quality of the project corridor to its users,
- To enhance visual quality along the highway, and



- To generate goodwill among the local community towards the project, by the enhancement of common property resources.

The various enhancement measures proposed for the project highway include:

- Enhancement of road-side facilities viz. bus bays, truck terminals, junction development etc.
- Improvement of aesthetic qualities of the project (landscaping, selective tree plantation) and plantation of bushes in median.
- Management of existing problems (lack of shade to the slow moving traffic);
- Landscaping along the project corridor;
- Improvement of the natural resources for the local population (provision of fodder, fuel wood, etc. by careful selection of species to be planted along the road if land is available) and,

The proposed enhancement measures are described in the following sections.

4.2.15 Natural Environment

4.2.15.1 Landscaping

Project road will be landscaped by using various techniques of soft landscapes, principally through planting of various types of trees. Proposed plant can be categorized into trees, shrubs, and ground covers.

4.2.15.2 Tree Plantation Schemes

Some basic norms to be followed in tree plantation scheme are:

1. Pure avenues plantation with single species (only to be) planted for a number of kilometers provide harmonious and pleasing look, and a regular and wavelike skyline. This row of trees forms the first and innermost line.
2. There is a remarkable coordination between the topography, shape of tree and sky. Accordingly the umbrella-like acacias and Gulmohars and semi-umbrella like Neem, Shisham, Willow are admirably suited to the flat nature of the country.
3. Selections of tree species in outer rows (where multiple rows are to be grown) were considered from economic point of view. Therefore, trees that provide fuel and fruit as well as small timber for agricultural implements have been suggested. Some fuel and small timber producing trees include babul, acacia;
4. The plantation of trees according to different densities may be:
 - Replantation: trees having girth less than 900mm.
 - Sparse plantation: one linear row of trees plantation
 - Medium density plantation: Two rows of tree plantation with the flowering shrub plantation
 - Dense plantation: More than two rows of tree plantation with dense shrubs.

4.2.15.3 Criteria for selection of tree species

The planting type was decided based on their requirement and feasibility at various sites along the project corridors. Physical growth characteristics of trees, like form and shape, foliage and rooting characteristics, growth rate, canopy type and branching



pattern were the major criteria in the selection of plantation type and density. From climatologically point of view, elimination of solar glare during low elevations of the sun was considered in the design decisions. Water table depths helped in the choice of plant material from the point of their survival rate after plantation. In a tropical country like India, where the temperature during summer months may rise up to a maximum of 46°C or more, the 'shade' is of greatest value to the travelers. Following are criteria for selection of species to be planted along the road at different locations.

- In stretches where the soil is largely alkaline, some salt-resistant varieties like Shisham, babul, Neem, Kikar, and Siris will be selected.
- In stretches where water logging occurs, on both sides of the road, the selection of tree species should be from amongst the moisture loving trees, for example, Eucalyptus, etc.
- Some of the trees like Pipal, Jamun (*Syzygium Jambolana*) have very weak wood and break easily in a wind storm. As a result, after the storm, roads become blocked and traffic is stopped for a long time. Such trees are unsuitable for roadside avenues and should only be planted in outer rows.
- Near market places and congested areas, the trees known for behaving as 'pollution sink' have been proposed. Though, trees in general absorb the pollutants, filter the air from pollutants, and act as noise barrier, but some trees like Neem (*Azadirachta Indica*), Mango (*Mangifera Indica*), Ashoka (*Saraca indica*), Pakur (*Ficus Infectoria*), Shisham (*Dalbergia Sisso*), Imlı (*Tamarindus Indica*), Mahua (*Bassia Latifolia*) can do it in a better way.
- Near sensitive areas like schools and hospitals, tall trees with thick canopies can create a wind screen through which the air can be filtered and the noise levels be considerably reduced. Some such trees are Ashok (*Saraca indica*), *Putranjiva Roxburghii* etc.
- Thorny trees like *Acacia arabica* and Ber (*Zizyphus jujuba*) should be avoided since their thorns are a nuisance for the pneumatic tiers of motor vehicles.
- In order to prevent glare from the headlights of incoming vehicles, various kinds of shrubs and low-heights trees are proposed in the median. The objective is to prevent glare without blocking vision. Some recommended species are: Casuarina (*Casuarina equisetifolia*), Chandani (*Tabernemontana*), Kachnar (*Bauhinia varigeta*), Plumeria rubra, Plumeria alba, Hamelia patens, Thespesia populnea, Jackaranda mimosaefolia, Kaner (*Thevetia nerifolia*), etc.

On the basis of the above criteria, the tree species recommended for landscaping of the Highway have been described in **Table 4.5**.


Table 4.5: Trees recommended for plantation along Project Road

Species of plants / Bushes / Herbs		Minimum No. of Rows	Distance from the edge of Carriage Way (m)
Botanical Name	Local Name		
<i>Mangifera indica</i>	Mango	2 (Depends upon the availability of space)	As per standards prescribed by Ministry of Road Transport & Highways
<i>Azadirachta Indica</i>	Neem	2	-do-
<i>Eucalyptus Atriadora Globulus</i>	Eucalyptus	Only where stagnant water exists	-do-
<i>Bouhunia Pupuria</i>	Kanchan	3	-do-
<i>Tamarindus indica</i>	Imli	2	-do-
<i>Ficus Bengalensis</i>	Bargad	2	-do-
<i>Delonix regia</i>	Gulmohar	2	-do-
<i>Dalbergia sisso</i>	Shisham	2	-do-
<i>Ficus religiosa</i>	Pipal	2	-do-
<i>Acacia arabica</i>	Babul	3	-do-
<i>Bauhinia Variegata</i>	Kachnar	2	-do-

Under Growth and Edges along Clear Zone

The clear zone along various corridors is of varied nature depending upon the different embankment heights. Some areas have slight gradients that need intensive stone pitching treatment. In order to increase the structural stability of this type of treatments, plant materials such as shrubs and ground covers have been introduced in the interstices. They have been used with emphasis on their rooting characteristics so that they help in binding the stone pitching treatments. In areas of high water table or water logging, special emphasis has been given on the selection of plant materials that can survive in moist conditions.

Developing herbal cover and turfing with grasses reduces the degree of soil erosion. The most important grasses recommended at the outmost boundary of the ROW include Khas, Kans and Sarpat. The Khas has an added advantage since its roots produce the scented oil used in perfumeries. Small cottage industries of perfumery can be developed in certain areas if such planting is carefully implemented

4.2.16 Institutional Arrangement

4.2.16.1 General

The Monitoring and Evaluation are critical activities in implementation of the Project. Monitoring involves periodic checking to ascertain whether activities are going according to plan or not. It provides the necessary feedback for project management to ensure project objectives are met and on schedule. The reporting system is based on accountability to ensure that the Environmental Management Plan is implemented.

This chapter summarizes the institutional arrangements, reporting system arrangements and training details for the implementation of the environmental management plan.

4.2.16.2 Existing Institutional Arrangements

Existing Institutional Capacity in Project Implementation Unit (PIU), NHAI, Srinagar

On behalf of Government of India, PIU, NHAI, Srinagar has been entrusted to develop the standalone 4/6 Lane Ring Road/Bypass around Srinagar. The project will be a



Public Private Partnership (PPP) venture in Design-Build-Finance-Operate (DBFO) pattern.

The Project Director, PIU, NHAI, Srinagar is responsible for the successful implementation of the Project. Project Director and his supporting staff as Employers representatives nominated for the project are responsible for the implementation of the Projects under his division.

Chapter 9

Environmental Benefit Analysis



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CHAPTER - 9: ENVIRONMENTAL BENEFIT ANALYSIS

Since no scoping has been done at TOR stage, so that only environmental cost is assessed and proposed in this section.

The environmental budget for the various environmental management measures proposed in the EMP and environmental monitoring plan are presented in **Table 9.1**. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Cost. Various environmental aspects covered under engineering costs are listed below:

- Turfing and Pitching of slopes
- Construction of slope protection works as retaining walls, crash barriers etc.
- Cleaning of culverts
- Safety signage
- Junction development etc.

9.1 CONSTRUCTION RELATED ENVIRONMENTAL MITIGATION COSTS

This includes the mitigation costs for the following items as indicated in **Table 9.1**

Dust Suppression / Management

The contractor shall take an all out effort to reduce the level of dust during construction. As a good practice, the contractor shall use the “vehicle mounted vacuum cleaner brooms’ instead through manual labour and brooms, which creates lot of dust during road cleaning operation. The cost for this is a part of good engineering practices, while cost incurred for additional water sprinkling along the construction surface to suppress excessive dust will be completely met from the environmental mitigation costs.

Prevention of Water and Soil Pollution

In order that water and soil does not get polluted from discharge of oil and grease from construction vehicle area, vehicle parking area, and workshops, etc., an oil interceptor shall be provided at such locations.

Borrow Area Rehabilitation

The borrow areas shall be rehabilitated as per the Contractor’s Environmental Management Plan.

Compensatory Afforestation and its Maintenance

Due to proposed activity about 17929 trees tree have to be removed. Afforestation work shall be carried out in 1:3 ratio of impacted trees to enhance the environmental quality as well as aesthetics.

Environmental Enhancement Measures

In general environmental enhancement measures such as landscaping, selective tree planting, improvement of the natural resources for the local population (provision of fodder, fuel wood, etc. by careful selection of species to be planted within the RoW) etc. shall be carried out to improve the aesthetics in the project area. Environmental enhancement measures pertaining to Bus Shelter / Bus Bay, Truck terminals, and Junction improvement should be provided as per engineering designs.



Waste Disposal

Disposal of waste shall be carried out as per the Contractor's Environmental Management Plan and waste disposal guideline.

Site Restoration

Restoration of construction sites such as diversions, workers camps (with respect to drainage arrangements, sanitation and storage area), and at construction yards shall be taken up once the works at such locations have been completed as per the Contractor's Site Restoration Plan and Environmental Management Plan.

9.2 CONSTRUCTION / OPERATION RELATED MONITORING COSTS

This includes the mitigation costs for the following items as indicated in **Table 9.1**

Air Quality

Air quality parameters such as PM_{2.5}, PM₁₀, SO₂, NO_x, CO shall be monitored at hot-mix plant / batching plant locations at stretches of the project road where construction is in progress. During operational stage the same parameters shall be measured as advised by EO-IC.

Water Quality

Water quality parameters such as PH, BOD, COD, TDS, TSS, DO, Oil and grease and Pb etc. shall be monitored as advised by the EO Independent Consultant (IC).

Noise Levels

Noise quality parameters during construction stage will be monitored at equipment yards and at other locations as advised by the EO of the IC.

Soil Erosion

During construction, parameters such as turbidity in storm water, silt load in pond/rivers as listed in **chapter-3** shall be monitored as directed in the monitoring plan. Similarly during operational stage the same parameters shall be monitored.



Table 9.1: Environmental Budget for various Environmental Management Measures

	Stage	Item	Unit	Unit Cost (Rs.)	Quantity	Total Cost (INR)
(A) Mitigation cost						
Air	Construction	Dust Management with sprinkling of water, covers for vehicles transporting construction material	Km	80,000.00	About 60.9 kms	4872000.00
Water	Pre-Construction	Relocation of tub wells	No.	-	-	covered in Engineering and R&R Cost
		Combined oil & Sedimentation chambers	No.	50,000.00	2	100000
		Rain Water harvesting pit at the interval of 500m				covered in Engineering Cost
		Oil Interceptors at Vehicle parking areas	No.	15,000.00	1	15000.00
Flora		Cost of Compensatory afforestation 1:3 ratio of affected trees (17929 no)	no.	600	53787 no	32272200
		Cost of Avenue plantation along the highway 300 plants/km either side (600 plants/km x 60 km x Rs. 600.00)	No.	600	60km	21600000.00
		Median shrub plantation (Shrubs will be planted in median in three rows with 2 meter gaps i.e. 1500 shrubs/Km)	No.	200	60km	18000000.00
Safety	Constructions	Demarcating borrow areas clearly using fencing if needed	-	-	-	Covered in Engineering cost.
		Miscellaneous informatory signs and others	-	-	-	Covered in Engineering cost.
(A) Mitigation cost						76859200.00



	Stage	Item	Unit	Unit Cost (Rs.)	Quantity	Total Cost (INR)
(B) Monitoring costs						
Air Quality	Construction	Monitoring along the road by contractor	No. of Samples	10000	At 5 locations, thrice in a year for a period of 3 years (Total 5x3x3 = 45 Samples))	450000.00
		Monitoring at Hot mix plant and batch plant	No. of Samples	10,000.00	At 3 locations thrice in a year for 3 years (Total 3x3x3 = 27 Samples)	270000.00
	Operation	Monitoring along the road at locations where monitoring was done during constructions	No. of Samples	10000	At 5 locations, thrice in a year for a period of one years (Total 5x3x1 = 15 samples)	150000.00
Water Quality	Construction	Drinking water quality monitoring of labour camps/ works site	No. of Samples	7000	At 4 location, Thrice in a year for 3 years (Total 4x3x3 = 36 samples)	252000.00
	Operation	Monitoring along the road at locations where monitoring was done during constructions	No. of Samples	7000	At 4 locations thrice in a year for 1 year (Total 4x3x1 = 12samples)	84000.00
Noise Quality	Construction	Monitoring along the Hot mix plant and Batch plant	No. of Samples	1500	At 5 location, Thrice in a year for 3 years (Total 5x3x3 =45 Samples)	67500.00
	Operation	Monitoring along the road at locations where monitoring was done during constructions	No. of Samples	1500	At 5 locations, Thrice in a year for 1 years (Total 5x3x1 =15 Samples)	22500.00
Soil Quality	Construction	Monitoring along hot mix plant and batch plant	No of Samples	5000	At 3 locations, thrice in a year for 3 years (Total 3x3x3 = 27 samples)	13500.00
	Operation	Monitoring at hot mix plant and batch plant	No. of Samples	5000	At 3 locations thrice in a year for 1years (Total 3x3x1 =9 samples)	45000.00
Sub-Total B- Monitoring Costs						1354500.00



	Stage	Item	Unit	Unit Cost (Rs.)	Quantity	Total Cost (INR)
(C) Training & Other costs						
Training & Mobilization costs	Construction and operation	As per modules developed	L.S.			2,50,000.00
Enhancement	Construction and operation	As per Engineering Design				Covered in Engineering Cost
Sub-Total C: Training & Mobilization costs						250000.00
Sub Total A: Mitigation						76859200.00
Sub Total B: Monitoring Cost						1354500.00
Sub Total C: Training & Mobilization Costs						250000.00
Environmental Expert Salary during Construction 300000.00/month for 2 years(intermittent)						7200000.00
TOTAL						85663700.00
Contingency @ 5%						4283185.00
Total Environmental Budgets Cost						89946885.00
Eight Crore Nighty nine lakh Forty Six thousand Eight hundred Eighty five rupees only						

Chapter 10

Environmental Management Plan



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CHAPTER - 10: ENVIRONMENTAL MANAGEMENT PLAN

The environmental management measures shall be implemented during the various stages of the project viz: Pre-construction stage, Construction Stage and Operational Stage. The environmental management plan is as described below.

Environmental Management Plan (EMP)

Objectives of EMP

The Environmental Management Plan (EMP) consists a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operational phases of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The main aim of the Environmental Management Plan is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced. The objectives of the EMP at various stages of the project planning and implementation are as follows:

A description of the various management measures suggested during different stages of construction of ring road/ bypass and bridges is provided in **Table 10.1** and **Table 10.2** respectively.

10.1 PRE-CONSTRUCTION STAGE

10.1.1 Pre-construction activities by PIU/ Independent Consultant

Prior to the contractor mobilization, the NHAI will ensure that an encumbrance free Corridor of Impact is handed over to enable the start of construction. Clearance involves the following activities:

- Removal and felling of trees is very minimal,
- Relocation of common property resources and community assets like telephone poles, electric poles and hand pumps will be impacted.
- Formal arrangements for maintenance of enhancement sites. This includes plantation of trees and barricades along the highway.
- Modification (if any), of the contract documents by the Engineer of the NHAI/PIU

10.1.2 Pre-construction activities by Contractor

- Pre-construction stage involves mobilisation of the contractor and the activities undertaken by the contractor pertaining to the planning of logistics and site preparation necessary for commencing construction activities. The activities include:
- Joint field verification of EMP by the Environment Specialist of the Independent Consultant and Contractor.
- Identification and selection of material sources (quarry and borrow material, water, sand etc).
- Procurement of construction equipment / machinery such as crushers, hot mix plants, batching plants and other construction equipment and machinery.
- Selection, design and layout of construction areas, hot mix and batching plants, labour camps etc.
- Apply for and obtain all the necessary clearances/ NOC,s/ consents from the agencies concerned.



- Planning traffic diversions and detours including arrangements for temporary land acquisition.

10.2 CONSTRUCTION STAGE

10.2.1 Construction activities by the Contractor

Construction stage is the most crucial stage in terms of activities that require careful management to avoid environmental impacts.

There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Costs. They include providing roadside drainage, provision of cross drainage structures etc.

10.2.2 Construction activities by the PIU/Independent Consultants

The PIU/Independent Consultant shall be involved in the smooth execution of the project and assisting the contractor during this phase. Their work shall include but not limited to:

- Monitoring and guiding the contractor on adopting good environmental and engineering practices.
- Arrangement of plantation through the Forest Department
- Arranging training to the contractor and other stakeholders according to the needs arising.
- Making changes in the design if need arises.

10.3 OPERATION STAGE

The operational stage involves the following activities by PIU:

- Monitoring of environmental conditions through approved monitoring agency.
- Monitoring of operational performance of the various mitigation/enhancement measures carried out.



Table 10.1: Generic Environmental Management Plan

Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
PRE-CONSTRUCTION STAGE						
Pre-construction activities by PIU						
P.1	Alignment, Width of the Ring road and religious structures	The alignment was selected by shifting / adjusting the centerline of the road, adopting of suitable cross-sections and adjustment of the median width to minimize land acquisition, loss of settlements and to avoid environmentally sensitive features like religious structures etc. compatible with project activities.	Design Report, LA Act 1894 and its amendments	Throughout out Corridor	PIU, Revenue Dept., NGOs, Collaborating Agencies	EO-IC (Independent Consultant)
P.2	Land Acquisition	The acquisition of land and private properties will be carried out in accordance with the RAP and entitlement framework for the project. It will be ensured that all R & R activities including implementation of Environment Management Plan are completed before the start of work. PIU has to ascertain that any additional environmental impacts resulting from acquisition of land are addressed and integrated into the EMP and other relevant documents.	LA Act 1894 and its amendments	Throughout out Corridor	PIU, Revenue Dept., NGOs, Collaborating Agencies	EO-IC
P.3	Preservation of Trees	All efforts will be made to preserve trees including evaluation of minor design adjustments/ alternatives to save trees. Specific attention will be given for protecting giant trees, and locally important trees (religiously important etc.). Tree cutting is to proceed only after all the legal requirements including attaining of In-principle and Formal Clearances from the Forest Dept. / MoEF are completed and subsequently a Written order is issued to the Contractor. Particular species declared as 'protected' by the State's Forest Dept. in the private land will be felled only after due clearance from the Forest Dept./ concerned agencies is obtained.	Clause No. 201.2 MORT&H Specifications for Road and Bridge works	Throughout out Corridor	PIU, Forest Department, Contractor	EO-IC



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		In the event of design changes, additional assessments including the possibility to save trees shall be made. Stacking, transport and storage of the wood will be done as per the relevant norms. Systematic corridor level documentation for the trees cut and those saved will be maintained with "EO-IC".				
P.4	Relocation of Community Utilities and Common Property Resources	All community utilities and properties i.e., water supply lines, sewer lines, hand pumps will be relocated before construction starts, on any section of the project corridor. The PIU will relocate these properties in consultation and written agreement with the agency/ owner/community. Environmental considerations with suitable/required actions including health and hygiene aspects will be kept in mind while relocating all community utilities and resources.	As in RAP	Throughout out Corridor	PIU, Concerned Agencies, Contractor	EO-IC
P.5	Orientation of Implementing Agency and Contractors	The PIU shall organize orientation sessions and regular training sessions during all stages of the project. This shall include on-site training (general as well as in the specific context of a sub-project). These sessions shall involve all staff of Independent Consultants, field level implementation staff of PIU and Contractor, Environmental Experts. The contractor will ensure that his staff including engineers, supervisors and operators attend the training sessions.	Project Requirements	Throughout out Corridor	Contractor	EO-IC
P.6						
P.6.1	Joint Field Verification	The Environmental Expert of IC and the Contractor will carry out joint field verification to ascertain any additional possibility to saving trees, environmental and community resources. The verification exercise should assess the need for additional protection measures or changes in design/ scale/ nature of protection measures including the efficacy of enhancement measures suggested in the EMP. Proper	Project Requirements	Throughout out Corridor	Contractor/ Environmental Expert of IC	PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		documentation and justifications/reasons shall be maintained in all such cases where deviation from the original EMP is proposed.				
P.6.2	Assessment of Impacts due to Changes/Revisions/ Additions in the Project Work	The Environmental Expert of IC will assess impacts and revise/ modify the EMP and other required sections of the project documents in the event of changes/ revisions (including addition or deletion) in the project's scope of work.	Project Requirements	Throughout out Corridor	Contractor/ Environmental Expert of IC	PIU
P.6.3	Crushers, hot-mix plants and Batching Plants Location	Hot mix plants and batching plants will be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants will be located at least 1000 m away from the nearest village/ settlement preferably in the downwind direction. The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Expert of IC shall be necessary prior to their establishment. Arrangements to control dust pollution through provision of windscreens, sprinklers, and dust encapsulation will have to be provided at all such sites. Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and Consent/NOC for all such plants shall be submitted to the "PIU through Independent Consultant. The Contractor shall not initiate plant/s operation till the required legal clearances are obtained and submitted. The engineer will ensure that the regulatory and legal requirements are being complied with.	Clause No 111.1 MoRT&H Air (P&CP) Act 1981,	Throughout out Corridor	Contractor	Engineer, EO-IC
P.6.4	Other Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery to be procured for construction will confirm to the relevant Indian Standard (IS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to.	Project Requirement Guideline-I	Throughout out Corridor	Contractor	Engineer, EO-IC



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>Noise limits for construction equipments to be procured such as compactors, rollers, front loaders concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.</p> <p>The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period, which shall be produced for EO - IC and PIU verification whenever required.</p> <p>Mobile equipment shall be placed at least 100metres away from the nearest dwelling.</p>				
P.7						
7.1	Borrow Areas	<p>Finalizing borrows areas for borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the contractor.</p> <p>The Contractor will not start borrowing earth from select borrow area until the formal agreement is signed between landowner and contractor and a copy is submitted to the "EO-IC/PIU through the Engineer.</p> <p>Locations finalized by the contractor shall be reported to the Environmental Expert of IC and who will in turn report to PIU.</p> <p>Planning of haul roads for accessing borrow materials will be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible (in case such a land is disturbed, the Contractor will rehabilitate it as per Borrow Area Rehabilitation Guidelines) and will use the existing village roads wherever available.</p> <p>In addition to testing for the quality of borrow materials by the IC, the environmental personnel of the IC will be required</p>	Clause No. 111.2 & 305.2.2 MORT&H Specifications for Road and Bridge works Guideline-I and V Guidelines for Borrow Area Management).	Borrow Areas	Contractor	EO-IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		to inspect every borrow area location prior to approval The IC will make sure that each such site is in line with IRC and other Project Guidelines.				
P.7.2	Quarry	Contractor will finalize the quarry for procurement of construction materials after assessment of the availability of sufficient materials, quality and other logistic arrangements. In case the contractor decides to use quarries other than recommended by Feasibility consultants, then it will be selected based on the suitability of the materials and as per established law. The contractor will procure necessary permission for procurement of materials from Mining Department, District Administration and State Pollution Control Board and shall submit a copy of the approval and the rehabilitation plan to the "PIU through Engineer. Contractor will also work out haul road network and report to Environmental Expert of IC and IC will inspect and in turn report to PIU before approval.	Clause No. 111.3 & MORT&H Specifications for Road and Bridge works	Along the Project Influence Area	Contractor	EO-IC, PIU
P.7.3	Arrangement for Construction Water	The contractor will use ground water as a source of water for the construction and can set up the own bore well facility for construction work. To avoid disruption/disturbance to other water users, the contractor will extract water from fixed locations and consult the Environmental Expert of IC before finalizing the locations. The Contractor will provide a list of locations and type of sources from where water for construction will be used. The contractor will seek approval from the EO-IC prior to the finalization of these locations The contractor will not be allowed to pump from any irrigation canal and surface water bodies used by	Clause No. 1010 MORT&H Specifications for Road and Bridge works EP Act 1986	Along the Project Road	Contractor	EO-IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		community. The contractor will need to comply with the requirements of the State Ground Water Department and seek their approval for doing so and submit copies of the permission to IC and PIU prior to initiation of any construction work.				
P.7.4	Labor Requirements	The contractor preferably will use unskilled labour drawn from local communities to give the maximum benefit to the local community.	Special Conditions of Contract	Along the Project Area	Contractor	EO-IC, PIU
P.7.5	Construction Camp Locations - Selection, Design and Lay-out	Siting of the construction camps will be selected by the contractor as per the guidelines. Construction camps will not be proposed within 500 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community applies only in case where a construction camp doesn't house plant sites. Location for stockyards for construction materials will be identified at least 1000 m from watercourses. The waste disposal and sewage system for the camp will be designed, built and operated such that no odor is generated.	Guidelines II Guidelines for Siting and Layout of Construction Camp	Along the Project Road	Contractor	EO- IC, PIU
P.7.6	Arrangements for Temporary Land Requirement	The contractor as per prevalent rules will carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction sites/hot mix plants/traffic detours/borrow areas etc. The Contractor will submit a copy of agreement to the Environment Expert of Independent Consultant. The Environmental Expert of IC will be required to ensure that the clearing up of the site prior to handing over to the owner (after construction or completion of the activity) is included in the contract.	Project Requirements	Along the Project Road	Contractor	EO- IC, PIU
P.7.7	Implementation - Information Meetings	The contractor will organize at least 2 implementation information meetings in the vicinity of Project Site (minimum one in each section) for general public to consult and inform people about his plans covering overall construction	Project Requirements	Along the Project Road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>schedule, safety, use of local resources (such as earth, water), traffic safety and management plans of debris disposal, drainage protection, canal training work during construction, pollution abatement and other plans, measures to minimize disruption, damage and in convenience to roadside users and people along the road. The first Implementation information meeting be conducted within four weeks of mobilization. The people should be informed about the date, time and venue at least 7 days prior to meetings. Public shall be informed about the meeting through display of posters at prominent public places (panchayat offices, offices of Market committees, Notice board of religious places etc.) and distribution of pamphlets along roadside communities or in any manner deemed fit. The contractor will maintain a channel of communication with the communities through his designated Environment and Safety Officer to address any concern or grievances. Periodic meetings will also be conducted during the construction period to take feedback from communities or their representatives to ensure minimum disturbance.</p> <p>The mechanism and contents for disclosure shall be approved by PIU prior to the meetings.</p>				
CONSTRUCTION STAGE						
C.1						
C.1.1	Clearing and Grubbing	<p>Vegetation will be removed from the construction zone before commencement of construction. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is minimum.</p> <p>Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the Environmental Expert of IC.</p>	Clause No. 201 MORT&H Specifications for Road and Bridge works	Along the project road work in progress	Contractor	EO-IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>The Contractor under any circumstances will not cut trees other than those identified for cutting and for which he has written instructions from the PIU.</p> <p>Vegetation only with girth of over 30 cm will be considered as trees and shall be compensated, in the event of PIU's instruction to undertake tree cutting.</p> <p>The sub grade of the existing pavement shall be used as embankment fill material.</p> <p>The existing base and sub-base material shall be recycled as sub-base of the haul road or access roads.</p> <ul style="list-style-type: none"> The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc. 				
C.1.2	Disposal of debris from dismantling structures and road surface	<p>The contractor shall identify disposal sites. The identified locations will be reported to the Environmental Expert of IC. These locations will be checked on site and accordingly approved by Environmental Expert of IC prior to any disposal of waste materials.</p> <p>All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the work and will be planned and implemented by the contractor as approved and directed by the Environmental Expert of IC.</p> <p>The pre-designed disposal locations will be a part of Comprehensive Solid Waste Management Plan to be prepared by Contractor in consultation and with approval of Environmental Expert of IC.</p> <p>Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area.</p>	Clause No. 201.4 MORT&H Specifications for Road and Bridge works	Along the project road work in progress	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
C.1.3	Other Construction Wastes Disposal	<p>The pre-identified disposal locations will be a part of Comprehensive Waste Disposal Management Plan to be prepared by the Contractor in consultation and with approval of Environmental Expert of IC. Location of disposal sites will be finalized prior to initiation of works on any particular section of the road.</p> <p>The Environmental Expert of IC will approve these disposal sites after conducting a joint inspection on the site with the Contractor.</p> <p>Contractor will ensure that any spoils of material unsuitable for embankment fill will not be disposed off near any water course, agricultural land, and natural habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and low-lying areas located in barren lands along the project corridors (if so desired by the owner/community and approved by the Environment Expert IC).</p> <p>Non-bituminous wastes other than fly ash may be dumped in borrow pits (preferably located in barren lands) covered with a layer of the soil. No new disposal site shall be created as part of the project, except with prior approval of the Environmental Expert of IC.</p> <p>All waste materials will be completely disposed and the site will be fully cleaned and certified by Environmental Expert of IC before handing over.</p> <p>The contractor at its cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.</p>	Clause No. 301.3.2 MORT&H Specifications for Road and Bridge works	Along the Project Road	Contractor	EO- IC, PIU
C.1.4	Stripping, stocking and preservation of top soil	<p>The topsoil from all areas of cutting and all areas to be permanently covered will be stripped to a specified depth of 150 mm and stored in stockpiles. A portion of the temporarily acquired area and/or Right of Way will be</p>	Clause No. 301.2.2 MORT&H Specifications for Road and Bridge	Along the Project Road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>earmarked for storing topsoil. The locations for stock piling will be pre-identified in consultation and with approval of Environmental Expert of IC. The following precautionary measures will be taken to preserve them till they are used: Stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m. To retain soil and to allow percolation of water, silt fencing will protect the edges of the pile. Stockpiles will not be surcharged or otherwise loaded and multiple handling will be kept to a minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or vegetation. It will be ensured by the contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles. Such stockpiled topsoil will be utilized for - covering all disturbed areas including borrow areas only in case where these are to be rehabilitated as farm lands (not those in barren areas) top dressing of the road embankment and fill slopes filling up of tree pits, in the median and In the agricultural fields of farmers, acquired temporarily. Residual topsoil, if there is any will be utilized for the plantation at median and side of the main carriageway.</p>	works			
C.1.5	Accessibility	<p>The contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property accesses connecting the project road, providing temporary connecting road. The Contractor will take care that Schools and religious places are accessible to Public. The contractor will also ensure that the work on / at existing accesses will not be undertaken</p>		Along the Project Road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		without providing adequate provisions and to the prior satisfaction of Environmental Expert of IC. The contractor will take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up one after one so that traffic movement in any given area not get affected much.				
C.1.6	Planning for Traffic Diversions and Detours	Temporary diversions will be constructed with the approval of the Resident Engineer and Environmental Expert of IC for which contractor will seek prior approval for such plans. Detailed Traffic Control Plans will be prepared and submitted to the Resident Engineer for approval, seven days prior to commencement of works on any section of road. The traffic control plans shall contain details diversions; traffic safety arrangement during construction; safety measures for night - time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP- 55 document and The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. The contractor will also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from IC and PIU. The temporary traffic detours will be kept free of dust by sprinkling of water three times a day and as required under specific conditions (depending on weather conditions, construction in the settlement areas and volume of traffic).	Clause No. 112 MORT&H Specifications for Road and Bridge works IRC; SP 55 Guideline-VII Guidelines for Traffic management during construction	Along the Project Road	Contractor	EO- IC, PIU
C.2						
C.2.1	Earth from Borrow Areas for Construction	No borrow area will be opened without permission of the Environmental Expert of IC. The location, shape and size of the designated borrow areas will be as approved by the Environmental Expert of IC and in accordance to the IRC	Clause No. 305.2.2 MORT&H Specifications for Road and Bridge	Borrow Areas	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>recommended practice for borrow pits for road embankments (IRC 10: 1961). The borrowing operations will be carried out as specified in the guidelines for siting and operation of borrow areas.</p> <p>The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; will be maintained dust free by the contractor. Sprinkling of water will be carried out twice a day to control dust along such roads during their period of use.</p> <p>During dry seasons (winter and summer) frequency of water sprinkling will be increased in the settlement areas and Environmental Expert of IC will decide the numbers of sprinkling depending on the local requirements.</p> <p>Contractor will rehabilitate the borrow areas as soon as borrowing is over from a particular borrow area in accordance with the Guidelines for Redevelopment of Borrow Areas or as suggested by Environmental Expert of IC.</p> <p>The final rehabilitation plans will be approved by the Environmental Expert of the IC.</p>	works Guideline-V Guidelines for Borrow areas management			
C.2.2	Quarry Operations	<p>The contractor shall obtain materials from quarries only after the consent of the Department of Mining / SPCB (both the states) / District Administration or will use existing approved sources of such materials. Copies of consent/ approval/ rehabilitation plan for opening a new quarry or use of an existing quarry source will be submitted to Environment Expert IC and the Resident Engineer.</p> <p>The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy to PIU and IC prior to opening of the quarry site.</p> <p>The quarry operations will be undertaken within the rules</p>	Clause No. 111.3 MORT&H Specifications for Road and Bridge works Guidelines VI Guideline for Quarry Management	Quarry Areas	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		and regulations in force in the state.				
C.2.3	Transporting Construction Materials and Haul Road Management	<p>Contractor will maintain all roads (existing or built for the project), which are used for transporting construction materials, equipment and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials.</p> <p>All existing highways and roads used by vehicles of the contractor or any of his sub-contractor or suppliers of materials and similarly roads, which are part of the works, will be kept clear of all dust/mud or other extraneous materials dropped by such vehicles.</p> <p>Contractor will arrange for regular water sprinkling as necessary for dust suppression of all such roads and surfaces with specific attention to the settlement areas.</p> <p>The unloading of materials at construction sites/close to settlements will be restricted to daytime only.</p>	Project Requirement	All Roads Used	Contractor	EO- IC, PIU
C.2.4	Construction Water	<p>Contractor will arrange adequate supply and storage of water for the whole construction period at his own costs. The Contractor will submit a list of source/s from where water will be used for the project to 'PIU' through the Engineer.</p> <p>The contractor will source the requirement of water preferentially from ground water but with prior permission from the Ground Water Board. A copy of the permission will be submitted to 'PIU' through the Engineer prior to initiation of construction.</p> <p>The contractor will take all precaution to minimize the wastage of water in the construction process/ operation.</p>	Clause No. 1010 EP Act 1986 MORT&H Specifications for Road and Bridge works	Along the Project Road	Contractor	EO- IC, PIU
C.3						
C.3.1	Disruption to Other Users of Water	<p>While working across or close to any perennial water bodies, contractor will not obstruct/ prevent the flow of water.</p> <p>Construction over and close to the non-perennial streams shall be undertaken in the dry season. If construction work is</p>	Table 3. 13 of Chapter-3	All Water Bodies	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>expected to disrupt users of community water bodies, notice shall be served well in advance to the affected community by the contractor.</p> <p>The contractor will take prior approval of the River Authority or Irrigation Department for any such activity. The PIU and the Engineer will ensure that contractor has served the notice to the downstream users of water well in advance.</p>				
C.3.2	Drainage	Contractor will ensure that no construction materials like earth, stone, ash or appendage is disposed off in a manner that blocks the flow of water of any water course and cross drainage channels. Contractor will take all-necessary measures to prevent any blockage to water flow. In addition to the design requirements, the contractor will take all required measures as directed by the 'EO-IC' and the 'Resident Engineer' to prevent temporary or permanent flooding of the site or any adjacent area.	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works	Drainage line along the road	Contractor	EO- IC, PIU
C.3.3	Siltation of Water Bodies and Degradation of Water Quality	<p>The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth for embankment construction.</p> <p>Contractor will construct silt fencing at the base of the embankment construction for the entire perimeter of any water body (including wells) adjacent to the ROW and around the stockpiles at the construction sites close to water bodies. The fencing will be provided prior to commencement of earthwork and continue till the stabilization of the embankment slopes, on the particular sub-section of the road.</p> <p>The contractor will also put up sedimentation cum grease traps at the outer mouth of the drains located in truck lay byes and bus bays which are ultimately entering into any surface water bodies / water channels with a fall exceeding 1.5 m. in present case three Sedimentation Cum Grease Trap are proposed, However the item has been kept in case need</p>	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works Water (P & CP) Act 1981 Table 3.7 of Chapter-3	All Surface Water Bodies Along the Project Road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		arises during construction. Contractor will ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.				
C.3.4	Slope Protection and Control of Soil Erosion	<p>The contractor will take slope protection measures as per design, or as directed by the Environmental Expert of IC to control soil erosion and sedimentation. All temporary sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work and as such as no separate payment will be made for them. Contractor will ensure the following aspects:</p> <ul style="list-style-type: none"> • During construction activities on road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. • Turfing works will be taken up as soon as possible provided the season is favourable for the establishment of grass sods. Other measures of slope stabilization will include mulching, netting and seeding of batters and drains immediately on completion of earthworks. • In borrow pits, the depth shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank. • Along sections abutting water bodies, stone pitching as per design specification will protect slopes. 	<p>Clause No. 306 & 305.2.2 MORT&H Specifications for Road and Bridge works</p> <p>Guideline-IX Soil Erosion & Sedimentation Control)</p>	Along the Project Road	Contractor	EO- IC, PIU
C.4						
C.4.1						
C.4.1.1	Water Pollution from Construction Wastes	The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system.	Clause No. 501.8.6 MORT&H Specifications for	Along the Project road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		Contractor will avoid construction works close to the streams or water bodies during monsoon. All waste arising from the project is to be disposed off in the manner that is acceptable and as per norms of the State Pollution Control Board.	Road and Bridge works Water (P & CP) Act 1974			
C.4.1.2	Water Pollution from Fuel and Lubricants	The contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites will be located at least 500 m from rivers and irrigation canal/ponds. All location and layout plans of such sites will be submitted by the Contractor prior to their establishment and will be approved by the 'EO-IC, PIU/ NHAI. Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refueling areas as per the design provided. In all, fuel storage and refueling areas, if located on agricultural land or areas supporting vegetation, the top soil will be stripped, stockpiled and returned after cessation of such storage. Contractor will arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to IC and PIU) and approved by the Environmental Expert of IC. All spills and collected petroleum products will be disposed off in accordance with MoEF and state PCB guidelines. 'EO-IC and Resident Engineer' will certify that all arrangements comply with the guidelines of PCB/ MoEF or any other relevant laws.	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works Water (P & CP) Act 1974 Guideline XI Guidelines For The Storage, Handling, Use And Emergency Response For Hazardous Chemicals	Along the Project Road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
C.4.1.3	Chemical Attack	To limit the potential chemical attack the concrete foundation should contain minimum cement concrete of 330 kg/cc For Under water concrete 10% extra cement is used. Clear Concrete cover of minimum 75mm shall be provided to under water structures.	Project Requirements	Along the Project Road	Contractor	EO- IC, PIU
C.4.2						
C.4.2.1	Dust Pollution	The contractor will take every precaution to reduce the level of dust from crushers/hot mix plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source and by erection of screen/barriers. All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. The contractor will provide necessary certificates to confirm that all crushers used in construction conform to relevant dust emission control legislation. The suspended particulate matter value at a distance of 40m from a unit located in a cluster should be less than 500 micro gram/m ³ . The pollution monitoring is to be conducted as per the monitoring plan. Alternatively, only crushers licensed by the SPCB shall be used. Required certificates and consents shall be submitted by the Contractor in such a case to the 'EO-PIU' through the 'Engineer'. Dust screening vegetation will be planted on the edge of the RoW for all existing roadside crushers. Hot mix plant will be fitted with dust extraction units.	Clause No. 111 & 501.8.6 MORT&H Specifications for Road and Bridge works Air (P & CP) Act 1981	Along the Project Road, Construction Site/ Camps	Contractor	EO- IC, PIU
C.4.2.2	Emission from Construction Vehicles, Equipment and Machineries	Contractor will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of SPCB. The Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project. Monitoring	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works Air (P & CP) Act	Along the Project Road, all vehicles used/ Camps	Contractor	EO- IC, PIU,



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		results will also be submitted to 'PIU' through the 'IC'.	1981 Central Motor & Vehicle Act 1988			
C.4.3						
C.4.3.1	Noise Pollution: Noise from Vehicles, Plants and Equipments	<p>The Contractor will confirm the following:</p> <ul style="list-style-type: none"> All plants and equipment used in construction shall strictly conform to the MoEF/CPCB noise standards. All vehicles and equipment used in construction will be fitted with exhaust silencers. Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced. Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. Maintenance of vehicles, equipment and machinery shall be regular to keep noise levels at the minimum. At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, concrete mixing, batching will be stopped during the night time between 9.00 pm to 6.00 am. <p>No construction activities will be permitted around educational institutes/health centers (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school, health centers and hospitals between 9.00 am to 6.0 pm.</p> <p>Monitoring shall be carried out at the construction sites as per the monitoring schedule and results will be submitted to 'PIU' through the 'EO-IC'.</p>	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works EP Act 1986 Noise Rules 2002	Along the Project Road , all vehicles used/Camps	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
C.5						
C.5.1	Personal Safety Measures for Labour	<p>Contractor will provide:</p> <ul style="list-style-type: none"> • Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime, mortars & concrete etc. • Welder's protective eye-shields to workers who are engaged in welding works • Protective goggles and clothing to workers engaged in stone breaking activities and workers will be seated at sufficiently safe intervals • Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation. • Adequate safety measures for workers during handling of materials. • The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. <p>The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>The contractor will make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.</p> <p>The contractor will not employ any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.</p>	<p>The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and cess Act of 1996 Factories Act 1948 Guideline VIII Guideline for workers safety During construction</p>	<p>Along the Project Road , all vehicles used/ Camps/quarry area</p>	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>The contractor will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint.</p> <p>Contractor will provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry is rubbed and scrapped.</p> <p>The Contractor will mark 'hard hat' and 'no smoking' and other 'high risk' areas and enforce non-compliance of use of PPE with zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilization and will be approved by 'IC' and 'PIU'.</p>				
C.5.2	Traffic and Safety	<p>The contractor will take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the 'EO-IC' and 'Resident Engineer' for the information and protection of traffic approaching or passing through the section of any existing cross roads.</p> <p>The contractor will ensure that all signs, barricades, pavement markings are provided as per the MOSRT&H specifications. Before taking up of construction on any section of the existing lanes of the highway, a Traffic Control Plan will be devised and implemented to the satisfaction of 'EO-IC' and 'Resident Engineer'</p>	IRC: SP: 55 Guidelines VII Guidelines for Traffic Management during Construction	Along the Project Road , all vehicles used/ Camps	Contractor	EO- IC, PIU
C.5.3	Risk from Electrical Equipment(s)	<p>The Contractor will take all required precautions to prevent danger from electrical equipment and ensure that -</p> <ul style="list-style-type: none"> No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public in construction zones. <p>All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from</p>	The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of	Along the Project Road /Camp	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the 'Resident Engineer'.	1996 Factories Act 1948			
C.5.4	Risk Force Measure	The contractor will take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities. The contractor will make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor will identify necessary actions in the event of an emergency.	The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996 Factories Act 1948	Along the Project Road, construction Camps	Contractor	EO- IC, PIU
C.5.5	First Aid	The contractor will arrange for - <ul style="list-style-type: none"> a readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital Equipment and trained nursing staff at construction camp. 	The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996 Factories Act 1948	Along the Project Road, construction Camps	Contractor	EO- IC, PIU
C.5.6	Informatory Signs and Hoardings	The contractor will provide, erect and maintain informatory/safety signs, hoardings written in English and local language, wherever required as per IRC and MoSRTI specifications.	IRC:SP:55	Along the Project Road, construction Camps	Contractor	EO- IC, PIU
C.6						
C.6.1	Road side Plantation Strategy	The contractor will do the plantation at median and/or turfing at embankment slopes as per the tree plantation strategy prepared for the project. Minimum 80 percent survival rate of the saplings will be	Forest Conservation Act 1980 Guideline X	Along the Project Road	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		acceptable otherwise the contractor will replace dead plants at his own cost. The contractor will maintain the plantation till they handover the project site to PIU. The Environmental Expert of IC will inspect regularly the survival rate of the plants and compliance of tree plantation guidelines.	Guideline for median plantation and grass turfing			
C.6.2	Flora and Chance found Fauna	The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the Environmental Expert of IC and carry out the IC's instructions for dealing with the same. The Environmental Expert of IC will report to the near by forest office (range office or divisional office) and will take appropriate steps/ measures, if required in consultation with the forest officials.	Forest Conservation Act 1980 Wild Life Act 1972	Along the Project Road	Contractor	EO- IC, PIU
C.6.3	Chance Found Archaeological Property	All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the Environmental Expert of IC of such discovery and carry out the IC's instructions for dealing with the same, waiting which all work shall be stopped. The IC will seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence	The Ancient Monument and Archaeological Site Remains Act 1958	Along the Project Road, construction sites/Camps	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		the work in the site.				
C.7						
C.7.1	Accommodation	<p>Contractor will follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labor camp.</p> <p>The location, layout and basic facility provision of each labor camp will be submitted to 'EO-IC and 'PIU' prior to their construction.</p> <p>The construction will commence only upon the written approval of the Environmental Expert of IC.</p> <p>The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the IC.</p>	<p>The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996</p> <p>Factories Act 1948</p> <p>Guidelines II</p> <p>Guidelines for Siting and Layout of construction camp</p>	Along the Project Road, construction Camps/site	Contractor	EO- IC, PIU
C.7.2	Potable Water	<p>The Contractor will construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing.</p> <p>The Contractor will also provide potable water facilities within the precincts of every workplace in an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.</p> <p>The contractor will also guarantee the following:</p> <p>a) Supply of sufficient quantity of potable water (as per IS) in every workplace/labor campsite at suitable and easily accessible places and regular maintenance of such facilities.</p> <p>b) If any water storage tank is provided that will be kept such that the bottom of the tank at least 1mt. from the</p>	<p>The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996</p> <p>Factories Act 1948</p>	Along the Project Road, construction Camps/construction site	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		<p>surrounding ground level.</p> <p>c) If water is drawn from any existing well, which is within 30mt. proximity of any toilet, drain or other source of pollution, the well will be disinfected before water is used for drinking.</p> <p>d) All such wells will be entirely covered and provided with a trap door, which will be dust proof and waterproof.</p> <p>e) A reliable pump will be fitted to each covered well. The trap door will be kept locked and opened only for cleaning or inspection, which will be done at least once in a month.</p> <p>Testing of water will be done as per parameters prescribed in IS 10500:1991.</p>				
C.7.3	Sanitation and Sewage System	<p>The contractor will ensure that -</p> <ul style="list-style-type: none"> the sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place separate toilets/bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women adequate water supply is to be provided in all toilets and urinals <p>All toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition.</p>	Project Specific Requirement	Along the Project Road, construction Camps/Construction Sites	Contractor	EO- IC, PIU
C.7.4	Waste Disposal	<p>The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Expert of IC.</p> <p>Unless otherwise arranged by local sanitary authority,</p>	Guidelines II Guidelines for Siting and Layout of Labor Camp	Along the Project Road, construction Camps	Contractor	EO- IC, PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Location	Responsibility	
					Planning and Execution	Supervision/ Monitoring
		arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Environmental Expert of IC will have to be provided by the contractor.				
C.8						
C.8.1		The 'EO-IC' will contact the responsible people with the enhancement drawing of the site for which enhancement has been proposed and take their consent before the start of work. Accesses to Different Schools along the road will be developed to the satisfaction of 'PIU'.		Along the Project Road	Contractor	EO- IC, PIU
C.9						
C.9.1	Clean-up Operations, Restoration and Rehabilitation	Contractor will prepare site restoration plans, which will be approved by the Environmental Expert of IC. The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures; dispose all garbage, night soils and POL waste as per Comprehensive Waste Management Plan and as approved by IC. All disposal pits or trenches will be filled in and effectively sealed off. Residual topsoil, if any will be distributed in pre identified approved areas or in places suggested by the 'EO - IC' areas in a layer of thickness of 75 mm-150 mm. All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Environmental Expert of IC and PIU/ NHAI will certify in this regard.	Guidelines IV Guidelines for Disposal Site management	Along the Project Road, construction Camps	Contractor	EO- IC, PIU



Table 10.2: Environmental Management Plan

Sl. No.	Environmental Issue	Management Measures	Reference	Time Frame	Location	Responsibility	
						Execution/ Civil Work	Supervision/ Monitoring
OPERATION STAGE							
Activities to be Carried Out by the PIU							
O.1	Monitoring Operation Performance	The PIU will monitor the operational performance of the various mitigation/ enhancement measures carried out as a part of the project. The indicators selected for monitoring include the survival rate of trees; utility of enhancement provision, status of rehabilitation of borrow areas and disposal sites,		Operation Phage	Along the Project Road	PIU	PIU
O.2	Maintenance of Drainage	PIU will ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding. PIU will ensure that all the sediment and oil and grease traps set up at the water bodies are cleared once in every three months.		Operation Phase	Along the Project Road	PIU	PIU
O.3	Pollution Monitoring	The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/contamination in the selected locations as suggested or recommended by IC-EO PIU will either appoint PCB or its approved pollution-monitoring agency for the purpose.		Operation Phase	Along the Project Road	PIU through Pollution Monitoring Agency	PIU
O.3.1	Atmospheric Pollution	Ambient air concentrations of various pollutants shall be monitored as envisaged in the pollution-monitoring plan	Air (P & CP) Act 1981	Operation Phase	Along the Project Road	PIU through Pollution Monitoring Agency	PIU
O.3.2	Noise Pollution	Noise pollution will be monitored as per monitoring plan at sensitive locations. Noise control programs are to be enforced strictly. Monitoring the effectiveness of the pollution attenuation barriers Hospital Boundary wall will be taken up thrice in	Noise Rules 2002	Operation Phase	Along the Project Road	PIU through Pollution Monitoring Agency	PIU



Sl. No.	Environmental Issue	Management Measures	Reference	Time Frame	Location	Responsibility	
						Execution/ Civil Work	Supervision/ Monitoring
		the operation period.					
O.3.3	Water Pollution	Water Quality will be monitored as per monitoring plan	Water (P & CP) Act 1974	Operation Phase	Along the Project Road	PIU through Pollution Monitoring Agency	PIU
O.4.	Soil Erosion and Monitoring of Borrow Areas	Visual monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), and embankment > 2m. and other places expected to be affected, will be carried out once in every three months as suggested in monitoring plan.		Operation Phase	Along the Project Road	PIU	PIU
O.5	Road Safety	Road Safety will be monitored during operation especially at location where traffic-calming measures have been proposed.		Operation Phase	Along the Project Road	PIU	PIU







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