Pre-Feasibility Report

NAME OF THE PROJECT- "Development of 6 lane Access Controlled Greenfield Highway of Sirhind – Sehna Sec. from Km Ch. 0+000 to Km Ch. 108+000 (Total length = 108 km) in the State of Punjab under Bharatmala Pariyojana Phase II (Lot-9/Package-1)"

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भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India

SUBMITTED BY

National Highways Authority of India
Dwarka, Delhi

1.0 EXECUTIVE SUMMARY

Ministry of Road Transport and Highways, Government of India, has decided to improve the efficiency of freight movement in India. National Highways Authority of India (NHAI) has been entrusted for preparation of DPR to improve the road networks in the state of Punjab.

In pursuance of the above M/s Egis India Consulting Engineers Pvt Ltd in joint venture with M/s K & J Projects Pvt Ltd have been appointed as consultants to carry out the Inception, Feasibility Study and the Detailed Project Report for planning of 6 Lane Access Controlled Highway for Sirhind - Sehna section under Bharatmala Pariyojana in states of Punjab (Lot 9, Package 1).

This part of highway starts from near Sirhind (St. Ch. 0+000) and terminates near Sehna (End Ch. 108+000) in the state of Punjab. The length of the proposed alignment is approx. 108.00 km.

This is a green field alignment, access control and is proposed for 6-Lane. The main objective of the proposed project is to reduce the distance and travel time in Punjab state and to give connectivity to remote areas and major cities. The project lays emphasis on development of these areas and makes them available with the resources.

The proposed access controlled highway project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as the prime artery for the economic flow to this region. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as way side amenities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and road side plantation shall further improve the air quality of the region.

a. SALIENT FEATURES OF THE PROJECT

Project name	Development of 6 lane Access Controlled Greenfield Highway of Sirhind – Sehna Sec. from Km Ch. 0+000 to Km Ch. 108+000 (Total length = 108 km) in the State of Punjab under Bharatmala Pariyojana Phase II (Lot-9/Package-1) **Proposed Length** – 108 Km
Location	This part of highway starts from near Sirhind (St. Ch. 0+000) and terminates near Sehna (End Ch. 108+000) in the state of Punjab.
Latitude & Longitude	Start Location:30°35'19.48" N 76°25'09.63"E End Location: 30°24'41.91" N, 75°20'15.65"E
Land use	Agricultural land
Nearest railway station	Sirhind Railway Station (approx. 5.2 Km, aerial)

Nearest Airport	Chandigarh (Approx. 36 Km, aerial)
Seismic Zone	The area falls under seismic zone III which is categorized as severe intensity zone.(As per 1893:2002)

b. PROPOSED PLANNING

Type of project - National Highway (New)
Project cost - Rs 4733.58 Cr / 44 Cr (approx.)
Project Length - 108 km approx.

2.0 INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

a. IDENTIFICATION OF PROJECT PROPONENT

Ministry of Road Transport and Highways, Government of India, has decided to improve the efficiency of freight movement in India. National Highways Authority of India (NHAI) has been entrusted for preparation of DPR to improve the road networks in the State of Punjab.

b. BRIEF INFORMATION ABOUT THE PROJECT

The proposed project starts from near Sirhind (St. Ch. 0+000) and terminates near Sehna (End Ch. 108+000) in the state of Punjab. The total length of the proposed highway is approx.108 km. The proposed project highway will pass through 05 districts of Punjab namely Fatehgarh Sahib, Patiala, Malerkotla, Sangrur and Barnala.

c. NEED FOR THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY OR REGION

The proposed access controlled project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as the prime artery for the economic flow to this region. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as way side amenities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and road side plantation shall further improve the air quality of the region.

d. DEMAND-SUPPLY GAP

This is a green field alignment, access control and is proposed for 6-Lane.Vehicle operating cost will be reduced due to improved road quality and transportation will improve. It will help in development of the state and the Nation.

e. IMPORTS VS. INDIGENOUS PRODUCTION

Import/Indigenous production does not apply in the present case.

f. EXPORT POSSIBILITY

Not applicable in the present case.

g. DOMESTIC/ EXPORT MARKETS

Not applicable in the present case.

h. EMPLOYMENT GENERATION

During the construction of the road project around 1000 persons would be employed temporarily for a period of 2.5 years. However due to construction of toll plazas approx. 500 persons will be employed on permanent basis. The total manpower requirement for the project is 1500. Preference will be given to local people for employment. The Project will enhance economic development in the area through industrial growth, agricultural, and commercial development and consequent employment generation, savings in travel time & shall provide easy access to social infrastructure.

3.0 PROJECT DESCRIPTION

a. TYPE OF PROJECT INCLUDING INTERLINKED AND INTERDEPENDENT PROJECTS, IF ANY

The project is independent project, and it is a part of the Bharatmala Pariyojana of MoRTH.

b. LOCATION

The proposed project starts from near Sirhind (St. Ch. 0+000) and terminates near Sehna (End Ch. 108+000) in the state of Punjab. The total length of the proposed highway is approx. 108 km. The proposed project highway will pass through 05 districts of Punjab namely Fatehgarh Sahib, Patiala, Malerkotla, Sangrur and Barnala.

c. DETAILS OF ALTERNATE SITES

Three alternative alignments have been considered; option (i) Proposed alignment, option (ii) on the left-hand side of the proposed alignment and option (iii) on the right-hand side of the proposed alignment.

d. SIZE OR MAGNITUDE OF OPERATION

Length of the project: 108 Km approx. having proposed RoW of60 m.

e. GEOLOGY AND AGRICULTURE

Punjab State, located in northwestern part of India, has an area of 50,362 sq.km. which constitutes 1.57% of total area of country. The economy of the state is primarily agro based. The state falls in the Indus basin and is drained by three major rivers - the Ravi, Beas and the Sutlej apart from other drainage channels including the Ghaggar that drains the southern parts. In Punjab state about 85% of geographical area is under agriculture. It has a cropping intensity of 184%.

Traditionally, the farmers had followed the Maize-Wheat or Sugarcane-Maize-Wheat cropping pattern but during last about four decades, they have shifted to Wheat-Rice cropping pattern thereby leading to increased demand on irrigation water.

f. PRODUCTION PARAMETERS

Not Applicable in the present context.

g. DESIGN PARAMETERS

This is access controlled highway and will be designed based on IRC SP 99:2013 and IRC 87:2019. The width of RoW will be 60 m.

h. PROJECT DESCRIPTION WITH PROCESS DETAILS

No process is applicable being a construction project.

i. BLASTING

No blasting is proposed to be done.

j. RAW MATERIAL REQUIRED ALONG WITH ESTIMATED QUANTITY, LIKELY SOURCE, MARKETING AREA OF FINAL PRODUCT/S, MODE OF TRANSPORT OF RAW MATERIAL AND FINISHED PRODUCT

Materials requirement are Cement –1547400.6 MT, Sand - 462006 Cum, Aggregate – 8502287.4 Cum, Steel - 353532.4 MT, Bitumen – 34632363.6 MT, Fly Ash – 4183054.2 Cum, Earth Filling – 20462578.2 cum and Stone for pitching - 128339.8 MT.EPC Contractor before the start of construction would assess the actual quantity required and take necessary approval, if required. However, Steel and Cement would be sourced from Authorized Vendor. Soil, Sand and Aggregate will be procured from operational licensed borrow areas and quarries located around nearby areas. If any new borrow area or quarry site require to be opened, requisite permission will be obtained from concerned department before extraction of materials.

k. RESOURCE OPTIMIZATION/ RECYCLING AND REUSE

Guru Hargobind Thermal Power Plant (Bathinda), Guru Nanakdev Thermal Power Plant and Rajpura Thermal Power Plant at a distance of 30 km, 60 km and 25 km respectively of proposed project alignment and the fly ash will be used in the project depending upon their availability as per fly ash notification 2016 of MoEF&CC.

l. AVAILABILITY OF WATER ITS SOURCE, ENERGY / POWER REQUIREMENT AND SOURCE

- **Water Requirement**

The average water requirements is anticipated at 10000 KLD approx. during construction stage and will be extracted from suitable surface sources (canals) or ground water after obtaining necessary permissions from the competent authority.

- **Power**

Diesel generator and State Electricity Board will provide electricity required for construction equipment. Labor camps will be provided with LPG as fuel sourced from GOI authorized Supplier.

m. QUANTITY OF WASTES TO BE GENERATED (LIQUID AND SOLID) AND SCHEME FOR THEIR MANAGEMENT/ DISPOSAL

- **Solid Waste Generation & its Disposal**

Solid waste will be generated from construction camp and dismantling of existing structures. Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies. The following precaution will be taken for disposal:

- Dumping sites must be having adequate capacity equal to the amount of debris generated.
- Public perception and consent from the village Panchayats has to be obtained before finalizing the location.
- Develop waste management plan for various specific waste streams (e.g., reusable waste,
- Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach.
- Segregate and reuse or recycle all the wastes, wherever practical.
- Prohibit burning of solid waste
- Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route
- Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process.
- Provide refuse containers at each worksite.
- Request suppliers to minimize packaging where practicable.
- Place a high emphasis on good housekeeping practices.
- Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.

- **Liquid Effluent**

The sewage water generated in construction camp will be disposed through soak pits.

4.0 SITE ANALYSIS

a. CONNECTIVITY

The proposed project starts from near Sirhind (St. Ch. 0+000) and terminates near Sehna (End Ch. 108+000) in the state of Punjab. The proposed alignment is connected with Sirhind (4 km away), Fatehgarh Sahib (7 km away), Amloh (3 km away), Malerkotla (5 km away), Dhuri (10 km away), Barnala (7 km away), Sangrur (23km away), Ludhiana(46 km away), Patiala (25 km away), Ambala (42 km away)and Chandigarh (28 km away).

b. LANDFORM, LANDUSE AND LAND OWNERSHIP

- **Land Use**

The project area is mostly agricultural land.

- **Land Ownership**

The existing land use around the proposed project primarily comprises of agricultural land both under private and government ownership.

TOPOGRAPHY

The project area is located in the state of Punjab. The topography in the proposed project area is mainly plain and rolling area. The areas have an elevation ranging from 234m to 252.271 m.

EXISTING LAND USE PATTERN

The existing land use around the proposed project primarily comprises of agricultural land both under private and government ownership, land for cattle grazing, forest.

e. EXISTING INFRASTRUCTURE & SENSITIVE ECOLOGICAL LOCATIONS

S.No.	Areas	Name / Identity	Aerial distance (within 10 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	NA

2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	No	NA
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	Yes	Protected forest = Approx. 5 ha.
4	Inland, coastal, marine or underground waters	Yes	Ponds - 0 Nos., Canals – 05 Nos, Drains – 06 Nos, Stream – 01 No. and Distributary – 15 Nos.
5	State, National boundaries	No	-
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	-
7	Defense installations	No	-
8	Densely populated or built-up area	No	The proposed project alignment does not pass through any densely populated or built up area.
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	No	The proposed project alignment does not affect any hospitals, schools, places of worship, community facilities
10	Areas containing important, high quality or scarce resources. (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	Not applicable
11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	No	Not applicable
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions) similar effects	No	The area falls under seismic zone III.

a. SOIL CLASSIFICATION

The variations in soil profile characteristics are much more pronounced because of the regional climatic differences. The soil of this zone has developed under semi-arid condition. The soil is sandy loam to clayey with normal reaction (pH from 7.20 to 7.95).

CLIMATIC DATA FROM SECONDARY SOURCES

The Punjab Climate is determined by the extreme hot and extreme cold conditions. The region lying near the foot hills of Himalayas receive heavy rainfall whereas the region lying at a distant from the hills, the rainfall is scanty and the temperature is high.

Punjab Climate comprises of three seasons. They are the summer months that spans from mid-April to the end of June. The rainy season in Punjab is from the months of early July to end of September. The winter season in Punjab is experienced during the months of early December to the end of February. The transitional Seasons in Punjab are the post monsoon season and the post winter season.

Summer in Punjab actually commences from mid-April. But the temperature starts rising from February onwards. The summer months are followed by the rainy seasons. Generally, the rainy season in Punjab begins in the first weeks of July. It ranges from 250mm to 1000mm. The agriculture of the state highly depends on the rains. The monsoon is brought by the monsoonal winds blowing over the Bay of Bengal. The winter season in Punjab is mostly experienced in the month of January, when the temperature falls to 5 degrees in the night and it is around 12 degrees in the morning.

The post monsoonal transitional season remains quite fair and dry. In the post winter transitional season, hail storms and brief showers occur which causes damage to the crops. During the end of the March, the wind becomes dry. The Punjab Climate has been a great factor in contributing to the economy of the state.

b. SOCIAL INFRASTRUCTURE

The social infrastructure like educational facilities (primary and higher secondary schools, Degree College), drinking water supply, post office, public transportation are by and large are available in the study area.

PLANNING BRIEF

PLANNING CONCEPT

The state will have its own self-sustaining eco-system consisting of economic drivers through industrialization, utility & logistic infrastructure, Social Infrastructure including education, healthcare and other public amenities. It will be connected with by a 6-laneaccess-controlledhighway as an effective means of transportation in Punjab state.

a. ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

Only basic infrastructure facilities are available in the vicinity of in the study area. The proposed road is essential for improving faster and economical transportation facilities between Fatehgarh Sahib, Patiala, Malerkotla, Sangrur, Barnala and other major cities.

b. AMENITIES/FACILITIES

Office, Workshop etc.

Proper site services such as First Aid, Rest Shelter, toilet with soak pits & drinking Water will be provided to the workers.

Rest Shelter

Rest shelter along with first-aid station complying with all the provisions of State Rules shall be provided by project proponent.

Water Supply

Water will be supplied for human consumption, dust suppression and for plantation from surface water sources.

Power Supply

The power supply for project and construction camp will be done through D.G. Sets and State Electricity Board.

Transport of Men and Material

Employee will report to the duty on own means. The material from the site will be transported by trucks / tractor trolleys.

Communication

Mobile phones shall be used for communication.

Security Arrangements

Appropriate security arrangement shall be made.

5.0 PROPOSED INFRASTRUCTURE

a. CONSTRUCTION SITE

Temporary arrangements like site office, rest shelters, & approach roads etc. shall be provided. No permanent infrastructure is proposed.

c. RESIDENTIAL AREA

As the local person shall be employed, no residential building / housing are proposed. However, temporary construction camp will be established.

d. SOCIAL INFRASTRUCTURE

In-line with the Social Responsibility Activities at other operational sites, relevant developmental assistance shall be rendered depending on the local needs identified through studies.

e. CONNECTIVITY

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f. DRINKING WATER MANAGEMENT

Local Water supply is used for drinking purpose.

g. SEWERAGE SYSTEM

Soak pits shall be provided to workers camp & construction site.

h. INDUSTRIAL WASTE MANAGEMENT

Not applicable, as the activity will not be generating any industrial waste.

i. SOLID WASTE MANAGEMENT

No industrial solid waste will be generated. However, municipal / construction waste generated during construction will be disposed in environmental friendly manner.

6.0 REHABILITATION AND RESETTLEMENT (R&R) PLAN

The Project requires approx.745 ha. Approx.180 nos. of structures (mainly pump houses) are coming in the proposed RoW. The land will be acquired as per procedure laid down in RFCT LARR Act, 2013.

7.0 PROJECT SCHEDULE & COST ESTIMATES

a. LIKELY DATE OF START OF CONSTRUCTION AND LIKELY DATE OF COMPLETION

Project will be started after getting requisite statutory clearances. A construction period of 2.5 years has been envisaged.

b. ESTIMATED PROJECT COST ALONG WITH ANALYSIS IN TERMS OF ECONOMIC VIABILITY OF THE PROJECT

The capital cost of proposed project is estimated to be approx. Rs.4733.58 Crores.

8.0 ANALYSIS OF PROPOSAL

a. FINANCIAL AND SOCIAL BENEFITS WITH SPECIAL EMPHASIS ON THE BENEFIT TO THE LOCAL PEOPLE INCLUDING TRIBAL POPULATION, IF ANY, IN THE AREA

The proposed project starts from near Sirhind (St. Ch. 0+000) and terminates near Sehna (End Ch. 108+000) in the state of Punjab under Bharatmala Pariyojana by the Government of India. The proposed access controlled project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as the prime artery for the economic flow to this region. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as way side amenities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and road side plantation shall further improve the air quality of the region.