Draft Initial Environmental Examination

Project Number: 40648

October 2014

IND: Infrastructure Development Investment Program for Tourism (Tranche 3) State of Punjab – Imperial Highway Heritage Conservation and Visitor Facility Development (Package No. PB/IDIPT/T3/03-12/02)

Prepared by the Government of Punjab for the Asian Development Bank

CURRENCY EQUIVALENTS

(as of 7 October 2014)

Currency unit	–	Indian rupee/s (Re/Rs)
Re1.00	=	$0.0163
$1.00	=	Rs61.326

ABBREVIATIONS

ADB	–	Asian Development Bank
BOD	–	Biological Oxygen Demand
BoQ	–	Bill of Quantities
CO	–	Carbon Monoxide
CPCB	–	Central Pollution Control Board
CR	–	Community Reserve
DSC	–	Design and Supervision Consultant
EA	–	Executing Agency
EAC	–	Expert Appraisal Committee
EARF	–	Environment Assessment and Review Framework
EIA	–	Environmental Impact Assessment
EMP	–	Environment Management Plan
ES	–	Environmental Specialist
GC	–	General Conditions
Go	–	Government of India
GoP	–	Government of Punjab
IDIPT	–	Infrastructure Development Investment Program for Tourism
IEE	–	Initial Environmental Examination
INR	–	Indian Rupee
IPIU	–	Investment Program Implementation Unit
IPMU	–	Investment Program Management Unit
PUC	–	Pollution Under Control Certificate
MCA	–	Municipal Corporation of Amritsar
MLD	–	Million Liters per day
MoEF	–	Ministry of Environment and Forests
MFF	–	Multi- Trench Financing Facility
NGO	–	Non-Governmental Organization
NOx	–	Nitrogen oxide
PD	–	Project Director
PIU	–	Project Implementation Unit
PM	–	Particulate Matters
PMU	–	Project Management Unit
RP	–	Resettlement Plan

RPM	–	Respirable Particulate Matter
SAUW	–	South Asia Urban Development and Water Division
SC	–	Scheduled Castes
SEAC	–	State Expert Appraisal Committee
SO_2	–	Sulfur dioxide
SPM	–	Suspended Particulate Matter
SPS	–	Safeguards Policy Statement
STP	–	Sewage Treatment Plant

NOTES

In this report, "$" refers to US dollars.

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EXECUTIVE SUMMARY

1. **Background**. Infrastructure Development Investment Program for Tourism (IDIPT) will develop and improve basic urban infrastructure and services in the four participating states of Himachal Pradesh, Punjab, Uttarakhand and Tamil Nadu to support the tourism sector as a key driver for economic growth. It will focus on: (i) strengthening connectivity to and among key tourist destinations; (ii) improving basic urban infrastructure and services, such as water supply, road and public transport, solid waste management and environmental improvement, at existing and emerging tourist destinations to ensure urban amenities and safety for the visitors, and protect nature and culture-based attractions. Physical infrastructure investments will be accompanied by: (iii) capacity building programs for concerned sector agencies and local communities for better management of the tourist destinations and for more active participation in the tourism-related economic activities, respectively.

2. Government of Punjab proposed 13 subpojects under Tranche 3. The subproject Package No. PB/IDIPT/T3/03-12/02 is one of the subprojects to support conservation of heritage structures to professionally accepted standards in tourist clusters inclusive of management-plan based investments (Output 1) and improve connectivity to tourist destinations (Output 4).

3. **Executing and implementing agencies.** The executing agency is the Department of Tourism, Government of Punjab and the executing agency is the Punjab Heritage and Tourism Promotion Board (PHTPB). Project Management Unit (PMU) is set up at Chandigarh to coordinate the overall execution. Project Management Consultant (PMC) at Chandigarh provides assistance to PMU for the execution of the project. Project Implementation Unit (PIUs) are set up in Amritsar and Rupnagar, which are supported by respective Design Supervision Consultant (DSC) teams. The Punjab Public Works Department is the asset owner of this subproject.

4. **Subproject Components**. Various historical and cultural monuments have been identified and proposed for development/improvement. The identified monuments are having unique history of Mughal era. The present condition of the monuments are deteriorated / badly damaged. The imperial highway heritage conservation and visitor facility development Package No. PB/IDIPT/T3/03-12/02 subproject is proposed to conserve/revitalize Aam Khas Bagh, provide interpretation centres, visitor amenities, conserve historic landscape and develop tourist in the Mughal Route (Badshahi Sarak), tomb of Raffudin, tomb of Alfsani, tomb of Bibi Taj and Rauza Sharif. The following interventions are proposed:

- Conserving the original built fabric by following original material and techniques of construction for historical structures
- Provision of boundary wall.
- Provision of the entrance gate and guard rooms for security purpose.
- Adaptive reuse of structure and provision of interpretation center and craft centre
- Provision of tourist reception centre.
- Landscaping and site development

5. **Categorization**. Based on the proposed interventions, the subproject has been classified as Environmental Category B as per the SPS as no significant impacts are envisioned. Accordingly this Initial Environmental Examination (IEE) has been prepared and the

environmental impacts are assessed in order to provide mitigation and monitoring measures to ensure no significant impacts arises as a result of the subproject.

6. **Description of the Environment**. The proposed subproject is part of Eastern Circuit[1]. Subproject components are located in Fatehgarh Sahib District. The subproject district does not have any perennial rivers; it is supported by the canals from the River Sutlej. There are mostly agricultural fields in the vicinity of the subproject area. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject area. The subproject district forms a part of Punjab plain or Indo-Gangetic plain and is characterized by flat featureless surface with deposition of alluvial soils in recent geological past brought by rivers originating in Himalayas. The climate is characterized by its general dryness (except in the south-west monsoon season), a hot summer and a bracing cold winter. The year may be divided into four seasons. The temperature ranges from a minimum of 4°C in winter to 45°C in summer. May and June are generally hottest months and December and January are the coldest months. Relative humidity is high, averaging about 70 percent during monsoon. The average annual rainfall is about 489.4 mm. Soil is loamy sand at the surface and calcareous sandy loam in subsurface layers.

7. **Environmental Management**. An Environmental Management Plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The EMP will be included in civil work bidding and contract documents.

8. Locations and siting of the proposed infrastructures were considered in order to reduce the impacts further. The concepts considered in design of the subproject are (i) design, material and scale will be compatible to the local architectural, physical, cultural and landscaping elements; (ii) preference will be given to the use of local material and labour as best as possible; (iii) for conservation, local construction material available in the nearby region as best as possible suiting to those in existence; (iv) all painting (interior and exterior) will be with environment-friendly low volatile organic compound paints (v) earth backfill, if any will be done from the site excavated material; and (vi) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

9. **During the construction phase**, impacts mainly arise from the need to dispose of moderate quantities of construction debris. These are common impacts of building construction projects and there are well developed methods for their mitigation. Measures such as conducting work in the non-monsoon season and minimizing inconvenience by best construction methods will be employed. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. Facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only.

[1] The Eastern Circuit connects the main pilgrimage, historic and natural tourism assets of the eastern part of the state located on a line from Patiala, Fatehgarh Sahib, Chandigarh, Rajpura, Rupnagar, Ghanouli, Kiratpur, and Nangal. The Circuit is linked to the southeastern end of the Western Pilgrimage and Ecotourism Circuit in Himachal Pradesh and is the main route to access this circuit from the south.

10. **Mitigation measures** have been developed to reduce all negative impacts to acceptable levels. Mitigation will be assured by a program of environmental monitoring that would be conducted during construction. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

11. The stakeholders were involved in developing the IEE through on-site discussions and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the subproject. The IEE will be made available at public locations and will be disclosed to a wider audience via the ADB and PHTPB websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

12. The tourists and the local community in the subproject area will be the major beneficiaries of the project. The most noticeable net environmental benefits to the tourists and local community will be positive and large as the proposed subproject will improve access to reliable and adequate tourism facilities and propagate the local traditions and cultural heritage of the state. This subproject will also provide a common platform for local traditions and values; provide and improve business opportunities for local communities, linked to the cultural and natural heritage tourism.

13. **Consultation, Disclosure and Grievance Redress**. Public consultations will be done in the preparation of the detailed design and final IEE. On-going consultations will occur throughout the project implementation period. A grievance redressal mechanism has been described within the IEE to ensure that any public grievances are addressed quickly.

14. **Monitoring and Reporting**. The PMU, PIU, PMC and DSC will be responsible for environmental monitoring. The PIU with support from the DSC will submit monthly, quarterly and Semi-annual monitoring reports to the PMU. The PMU will consolidate the Semi-annual reports with the assistance of PMC and will send it to ADB. ADB will post the environmental monitoring reports on its website.

15. **Conclusions and Recommendations**. The proposed subproject is unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category “B” is confirmed. No further special study or Detailed Environmental Impact Assessment (EIA) needs to be undertaken to comply with ADB Safeguard Policy Statement (SPS), June 2009 or Government of India EIA Notification, 2006.

I. INTRODUCTION

A. Background

1. Infrastructure Development Investment Program for Tourism (IDIPT) will develop and improve basic urban infrastructure and services in the four participating states of Himachal Pradesh, Punjab, Uttarakhand and Tamil Nadu to support the tourism sector as a key driver for economic growth. It will focus on: (i) strengthening connectivity to and among key tourist destinations; (ii) improving basic urban infrastructure and services, such as water supply, road and public transport, solid waste management and environmental improvement, at existing and emerging tourist destinations to ensure urban amenities and safety for the visitors, and protect nature and culture-based attractions. Physical infrastructure investments will be accompanied by: (iii) capacity building programs for concerned sector agencies and local communities for better management of the tourist destinations and for more active participation in the tourism-related economic activities, respectively.

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- Landscaping and site development

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envisioned. Accordingly this Initial Environmental Examination (IEE) has been prepared and the environmental impacts are assessed in order to provide mitigation and monitoring measures to ensure no significant impacts arises as a result of the subproject.

6. **Purpose of the IEE.** This report gives an account of the initial environmental examination (IEE) of subproject Package No. PB/IDIPT/T3/03-12/02 as per SAR and preliminary design. It has been prepared in accordance with ADB SPS's requirements for environment Category B projects and provides measures to (i) ensure the environmental sustainability of subproject Package No. PB/IDIPT/T3/03-12/02; (ii) integrate environmental considerations into the project preparation process; and (iii) provide for environmental management during project implementation.

II. DESCRIPTION OF PROJECT COMPONENTS

A. Project Overview

7. The proposed subproject is part of Eastern Circuit[2]. It aims to enhance the participation of the local communities and the private sector in tourism. It will enhance tourist access and connectivity in Fatehgarh Sahib. The district is a part of the Sikh Heritage Trail and the Grand Trunk Trail which starts from Ambala to Wagah Border (Source: As per Punjab Tourism Development Master Plan, 2008-2023; UNWTO).

8. The subproject includes the following components:

(i) Conservation/Revitalization of Aam Khas Bagh, Interpretation Centres, Visitor Amenities, Conservation of Historic landscape.
(ii) Tourist Development of Mughal Route (Badshahi Sarak) through Conservation, Visitors Amenities, Tomb of Raffudin, Tomb of Alfsani, Tomb of Bibi Taj, Rauza Sharif.

B. Need of the Project, Present Condition and Subproject Components

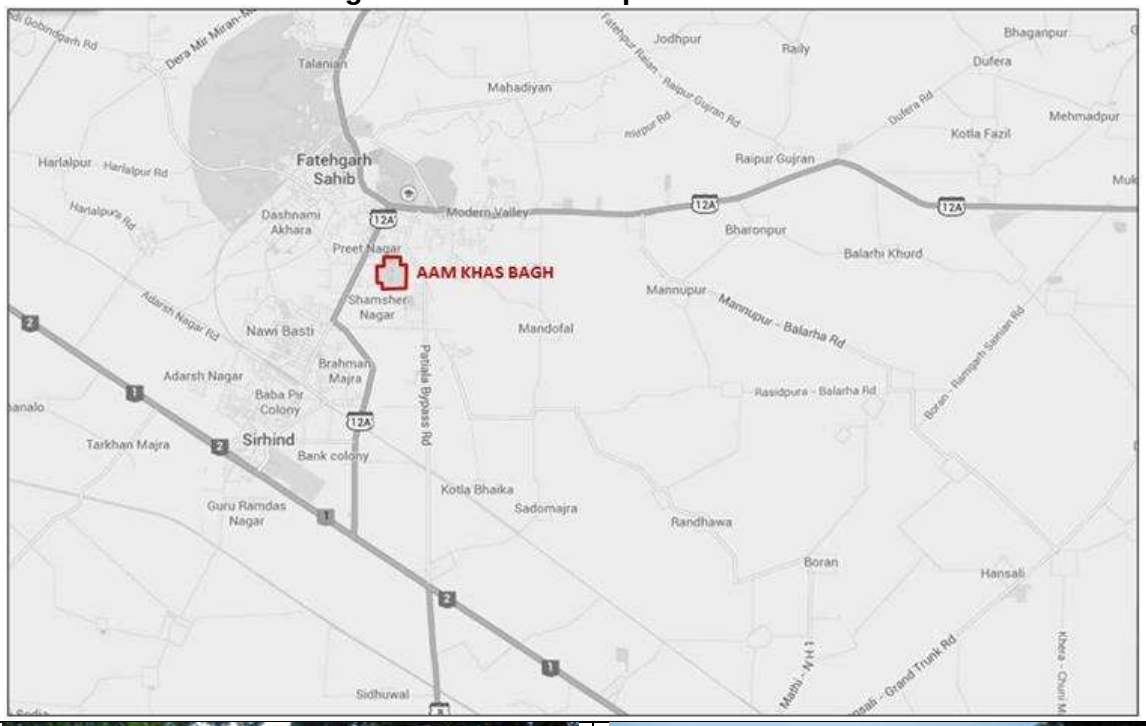
9. The town of Fatehgarh Sahib holds a significant place in the history of the state. It is also an important tourist place owing to Gurudwara[3] Fatehgarh Sahib which is the place of the martyrdom of Sahibzada Fateh Singh and Sahibzada Zorawar Singh (sons of Guru Gobind Singh Ji). Fatehgarh Sahib, meaning the 'Town of Victory', signifies the triumph and independence of the Sikhs from the tyrannical rule of the Muslims. This town is bounded by four gates, respectively dedicated to Dewan Todar Mal, Nawab Sher Muhammed Khan, Baba Banda Singh Bahadur and Baba Moti Ram Mehra. These gates have high architectural value and also signify the cultural diversity and secularity of the place. Major tourist places in Fatehgarh Sahib are Gurudwara Fatehgarh Sahib, Sanghol, Aam Khas Bagh, and Mata Chakreshvari Devi Jain Temple.

[2] The Eastern Circuit connects the main pilgrimage, historic and natural tourism assets of the eastern part of the state located on a line from Patiala, Fatehgarh Sahib, Chandigarh, Rajpura, Rupnagar, Ghanouli, Kiratpur, and Nangal. The Circuit is linked to the southeastern end of the Western Pilgrimage and Ecotourism Circuit in Himachal Pradesh and is the main route to access this circuit from the south.

[3] A gurdwara (Punjabi: ਗੁਰਦੁਆਰਾ, *gurduārā* or , *gurdwārā*), meaning the gateway to the guru, is the place of worship for Sikhs; however, people of all faiths are welcomed in the Sikh Gurdwara.

10. **Aam Khas Bagh.** Aam Khas Bagh, also known as Bagh-I-Hafiz Rakhna, is located in Fatehgarh Sahib District, Punjab. The subproject site is a Mughal garden situated approximately at a distance of 52 km from Chandigarh City (capital of Punjab). The structure was built during the reign of Akbar and further developed by Shajahan and Jahangir. The garden complex was used as a Royal *Sarai* (city). There are a lot of historical references mentioning this place being used by Mughal kings and royal families. There are several historical buildings inside the complex like Naughara, Sheesh Mahal, Hamam and Sarai Cells etc. Maulsari building is a later addition to this complex.

Figure 1: Location Map of Aam Khas



View of Aam Khas Bagh

Figure 2: Proposed area of Development in Aam Khas Bagh

11. The proposed subproject component for Aam Khas Bagh under this package are:

- Conserving the original built fabric by following original material and techniques of construction for historical structures comprising enclosure walls, bastions, northern pavilion and *mehtabi chabutara*.
- Conserving the decorative features.
- Vegetation clearance from the wall, cutting and uprooting all kinds of thick bushes at all levels of the historic surface.
- Consolidation and reconstruction of missing brick masonry: careful raking out joints in *nanakshahi* or *lakhori* masonry of lime or cement mortar and preparing the surface for re-plastering or pointing including disposal of rubbish at level including all lift and lead.
- Stitching of structural cracks/filling: stitching of masonry cracks by mechanical means including careful removal of the plaster and masonry of approximately 450mm to 900 mm wide and 200 mm deep.
- Consolidation of lime concrete flooring and demolition of ips flooring
- Algae removal and removal of multiple layers of lime wash.
- Removal dismantling of modular brick in fill
- Reconstruction of original brick work.
- Cleaning the exposed surface.
- Plastering the masonry surface with lime plaster.
- Repairing the terracing (gateways), sloping *chajjas* (bastions), brick brackets (bastions and enclosure walls)
- Site clearance from debris/mud.

- Provision of boundary wall on the eastern, western, and southern edge of the garden complex.
- Provision of the entrance gate and guard rooms for security purpose.
- Adaptive reuse of structure and provision of interpretation center and craft centre at Maulsari
- Provision of tourist reception centre at Maulsari.
- Landscaping and site development
    - Provision of visitor infrastructure and internal signage's of uniform sizes
    - Improved access.
- Provision of tented accommodation facilities on PPP model at Mehtab Bagh enclave. This will include:
    - toilet facilities
    - plinths for tents
    - base kitchen
    - conservation of structure

12. **Tombs of Raffudin, Alfsani and Bibi Taj.** The tombs are part of funerary landscape of Fatehgarh Sahib. There are many tombs in this area, located on outskirts of the main settlement. There are about 15 tombs in the region along with mosques and other places of religious importance. The selected tombs are all historic structures from the 14th to the 16th century, some of the oldest and good examples of architecture from that period, and are the only surviving examples of their period. These tombs are constructed on a raised plinth, about 1 m higher than the surrounding area. The base is constructed in basal (*kankar*) stone while the structure itself is constructed in stone and *nanakshahi*/*lakhori* bricks[4]. The core of these walls is built in mud mortar with two outermost layers in lime mortar. These are single cell, square in plan, symmetrical structures. The centrally located openings provide access from each side. The roof of these dome placed on an octagonal drum. The Tomb of Bibi Taj is an exception it has minarets on all four corners along with the dome. The interior is beautifully decorated with niches and motifs.

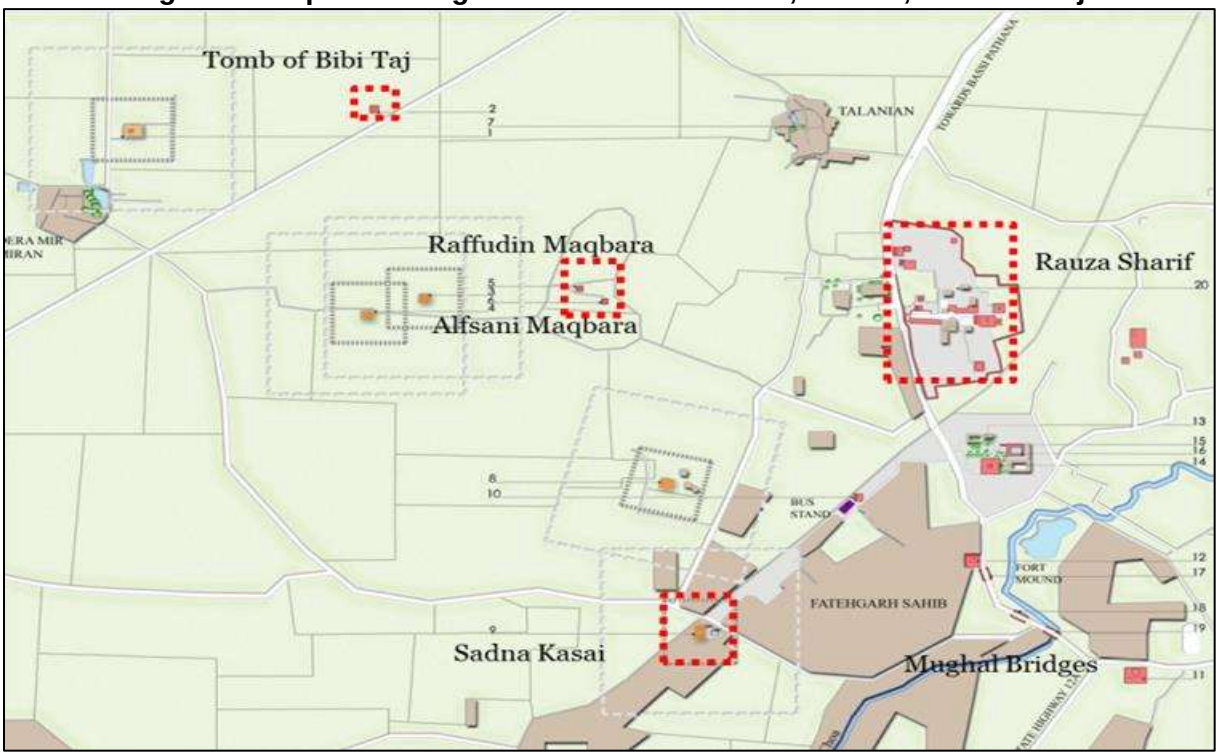
13. **Tomb of Rafuddin.** The Tomb of Rafuddin is a 16th century tomb and is one of the oldest surviving examples of architecture from that period. Also known as Ghode ka Maqbara (Horse's mausoleum), it is located in Harnam Nagar at the outskirts of village Talanian. The tomb stands in middle of agricultural fields and is approached by a pathway from the road. It stands on an elevated area with respect to its surrounding, however, its plinth is not visible. The base of the stone is constructed with basal (*kankar*) stone. The super structure is constructed in traditional lakhori bricks set in mud mortar as the core masonry. It is faced with *lakhori* bricks set in lime mortar.

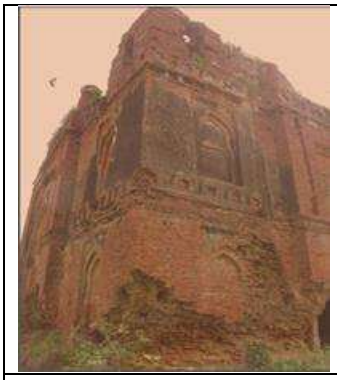
14. **Tombs of Alfsani.** The Tomb of Mujadid Alfsani is commonly known as Hathi ka Maqbar (Elephant's mausoleum). It is one of the oldest constructions which survived destruction of Sirhind by Sikhs. It is located on the outskirts of the settlement Talanian. It presently stands in ruinous condition, with agricultural fields cutting into its base. It is representative of 15 to 16th century tomb architecture. The architectural style is similar to another monument in Ludhiana which was constructed in early 15th century. These two tombs have unique details specific to Afghan architecture.

[4] Nanak Shahi bricks were decorative bricks used for structural walls during the Mughal era, The Nanak Shahi Bricks were less than 3/4 in every dimension from the contemporary bricks used in India nowadays those are 9 × 4¼ × 2¾ inches

15. **Tomb of Bibi Taj.** Bibi Taj was the daughter of the Aqil, brother of Caliph Ali. Her tomb is locally known as Haj-O-Taj. The most interesting feature of this structure is the exterior finish in blue glazed tiles. The tomb is representative of 15th century architecture. In the outskirts of the settlement Talanian (rural), this unprotected structure presently stands in ruinous condition surrounded by agricultural fields, along the main road, subjected to disuse and neglect.

Figure 3: Map indicating the Tombs of Raffudin, Alfsani, and Bibi Taj



		
Bibi Taj	**Tomb of Raffudin**	**Tomb of Alfsani**

16. The proposed subproject components for the tombs under this package are:

- Preservation and conservation of historic structures: Tombs of Raffudin, Alfsani and Bibi Taj. The conservation of these structures will address following areas:
  - Preventing decay of the historic fabric by addressing decay mechanisms in the buildings and precinct components.
  - Missing damaged elements/ features forming an integral part of historical

design need to be conserved so that understanding and appreciation of historical asset can be enhanced.

- Reversal of incompatible materials comprising the authenticity and integrity of structures.
- Conserving the original built fabric and decorative features of structures.
- Conserving the tangible and intangible aspects of the precinct.

- Conservation of high value original glazed tile and brick work by specialized professionals in Bibi Taj.
- Landscaping Site Development
  - Landscaping of the surrounding area.
  - Demarcating site boundary through landscaping around the structures.
  - Visitor infrastructure including lighting, parking, information kiosk, site interpretation, signage (uniform design) etc.

17. **Rauza Sharif Complex.** The Rauza Sharif Complex has more than one building to restore and a few site development works that are proposed. Sheikh Ahmed Sirhindi is recorded to have erected a mosque near his residence in 1008/1599-1600. On the same site a larger mosque is recorded to have been built by Tarbiyat Khan in 1064/1636-37. Most probably, the older part of the mosque that we see today was built by Tarbiyat Khan. As it has always been a living mosque, additions and alterations were made to it from time to time.

18. The main total structure of Rauza Sharif covers an area measuring 16.5 x 10.2m but at the most only the main sanctuary behind the verandah is original. The plan of the sanctuary comprises a single hall, measuring 14.4 x 4.2m, entered through three archways on the eastern side. The original facade which now lies concealed behind the verandah has three archways. The parapet of the building rises to a height of 6.2m. The skyline is formed by three domes, each placed on a 0.85m high octagonal drum. Each side of the octagonal drum measures 2.35m and that of the other ones, 2.15m. The rectangular hall has three *mihrabs* in the western wall.

19. An 'Urs' festival is organized on the 26, 27 & 28th of Safar every year, for which devotees from all over India participate staying at the Dargah Complex. The Urs festival has been held here for more than 300 years and is largely attended by Muslim nobility from Kabul and other devotees from Pakistan, Afghanistan, Indonesia, Bangladesh and other Muslim nations.

View of Rauza Sharif

20. The proposed subproject component for Rauza Sharif complex under this package are:

- Conservation and Restoration of six heritage buildings including interior decorative ceilings.
- Construction of toilet complexes and baths at Dargah complex, approximately 15 for men and 15 for women comprising a total area of 150 sq m.
- Paving of walkway towards guest rooms & site development works.
- Provision of internal signage (having uniformity in design) for the Dargah complex

C. Implementation Schedule

21. Preliminary design of the subproject has been done by the Design and Supervision Consultant (DSC) team and will be finalized during detailed design stage. It is estimated that construction period will cover 24 months.

22. The final detailed implementation schedule will be provided in the updated IEE once the detailed design phase is completed.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

23. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries and private sector loans.

24. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts and are assigned to one of the following four categories:

- **Category A**. Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- **Category B**. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- **Category C**. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- **Category FI**. Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all Projects will result in insignificant impacts.

25. **Environmental Management Plan.** An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

26. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centers, etc.), and a summary translated into Hindi/Punjabi for the project affected people and other stakeholders shall also be disclosed. The following safeguard documents will be put up in ADB,s website so that the affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

- For environmental category A projects, a draft EIA report at least 120 days before Board consideration;
- Final or updated EIA and/or IEE upon receipt; and
- Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.

B. National and State Laws

27. Implementation of the subproject will be governed by the national and State of Punjab environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subproject are consistent with the legal framework, whether national, state or municipal/local. Compliance is required in all stages of the subproject including design, construction, and operation and maintenance.

28. The environmental rules and regulations applicable for the subproject are listed in the **Table 1**. The Environmental Impact Assessment (EIA) notification, 2006 by the Ministry of Environment and Forests (MoEF, GoI) specifies the mandatory requirements for obtaining environmental clearance. Accordingly, all projects and activities are broadly categorized into two categories[5] - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man-made resources. Given that the sub-project is not covered in the ambit of the EIA notification, Environment clearance requirements from the GoI are not triggered.

Table 1: Environmental Regulatory Compliance

[5] All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, will require prior environmental clearance from the CentralGovernment in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification;

All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfil the General Conditions (GC) stipulated in the Schedule, *will* require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification.

In addition, General Condition (GC) of the notification specifies that any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries.

Subproject Components	Applicability of Acts/Guidelines	Compliance Criteria
1. Conservation/Revitalization of Aam Khas Bagh, Interpretation Centres, Visitor Amenities, Conservation of Historic landscape 2. Tourist Development of Mughal Route (Badshahi Sarak) through Conservation, Visitors Amenities, Site Interpretation and parking at Tomb of Raffudin, Tomb of Alfsani, Tomb of Bibi Taj, Rauza Sharif	The EIA notification, 2006 (and its subsequent amendments in 2009) provides the details for categorization of projects into category A and B, based on extent of impacts.	This subproject is not covered in the ambit of the EIA notification as they are not either covered under Category A or Category B of the notification. As a result of the above categorization, the subsequent environmental assessment and clearance requirements are not triggered
	Safeguard Policy Statement, 2009. The Environment Policy and Operations Manual (OM) 20: Environmental Considerations in ADB Operation	Categorization of sub-project components into A, B or C and developing the required level of environmental assessment for each component. Based on the construction activities involved in this subproject components, it shall be categorized as B
	Water (Prevention and control of pollution) Act, 1974 and Air (prevention and control of pollution) Act, 1981	Consent to Establishment (CTE) and Consent to Operation (CTO) is mandatory for all subproject components those requiring, setting up of hot mix plants, wet mix plants, stone crushers and diesel generators which can be obtained from the Punjab Pollution Control Board. The consent shall be obtained by the Contractor.
	The Noise Pollution (regulation and Control) Rules, 2000	The subproject shall put measures for abatement of noise including noise emanating from vehicular movements, blowing of horns, bursting of sound emitting firecrackers, use of loud speakers or public address system and sound producing instruments and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules.
	The Wildlife Conservation Act, 1972, amended in 2003 and 2006, provides for protection and management of Protected Areas.	The implementation of the subproject components does not have any impact on the forest and the wildlife, hence obtaining clearance under the Act is not envisaged at any stage of the project
	The Forest Conservation Act, 1980 and its subsequent amendments necessitate obtaining clearance from the MoEF for diversion of forest land for non-forest purposes.	Project site is not located within forest area (Reserved or Protected Forest). However, during the ground clearance, tree felling/ cutting permission have to be obtained from the forest department for the removal of the trees surrounding the monuments prior to the start of the construction works.
	The Ancient Monuments and Archaeological Sites and Remains Act, 1958, and the rules, 1959 provide guidance for carrying out activities, including conservation, construction and reuse in and around the protected monuments.	Not applicable as these monuments are not under the ambit of this Act. However, being a state protected monument. The Aam Khas Bagh requires clearance from the state for carrying out the civil oriented conservation works. The local archeological department suggestion on the same shall be considered during the project designing/ planning stages.

Source: MoEF, CPCB and ADB

29. The **Table 1** indicates that the proposed subproject does not need to go through a full-scale environmental assessment process; as the scale of impacts and categorization of the sub-

project components will not require clearances from Competent Authorities. Therefore, any further approvals or environmental clearances from the GoI or GoP are not envisaged.

30. The ADB guidelines, stipulate addressing the environmental concerns, if any, of a proposed activity in the initial stages of project preparation. For this, the ADB Guidelines categorizes the proposed components into categories (A, B or C) to determine the level of environmental assessment that is required to address the potential impacts. The Rapid Environmental Assessment (REA) checklist method was followed as per ADB requirement to assess the potential impacts of the project in planning phase. The REA checklist is attached as **Appendix 2** with this report. The subproject has been categorized as B. Accordingly this IEE is prepared to address the potential impacts, in line with the recommended IEE content and structure for Category B projects. The IEE was based mainly on secondary sources of information and field reconnaissance surveys. Stakeholder consultation was an integral part of the IEE. An Environmental management plan (EMP) outlining the specific environmental measures that are to be adhered to during implementation of the subproject has been prepared.

IV. DESCRIPTION OF ENVIRONMENT

A. Environmental and Social Profile

31. The sub project area is located in the Fatehgarh Sahib district, which lies between 30°25'00" to 30°45'45" North latitude and 76°04'30" to 76°35'00" East longitude. The total area of the Fatehgarh Sahib district is 1147 sq.km. Fatehgarh Sahib District was constituted on April 13th 1992 by carving out portions of Ludhiana, Fatehgarh Sahib - Sirhind and Ropar districts. The district is bounded by Ludhiana and Rupnagar in the North, Patiala in the South, parts of Rupnagar and Patiala in the East and parts of Ludhiana and Sangrur in the West. Mandi Gobindgarh, Sirhind, Bassi Pathana, Amloh, Khamano and Khera are the important cities and blocks of Fatehgarh Sahib.

1. Physiography:

32. Fatehgarh Sahib forms a part of Punjab plain or Indo-Gangetic plain and is characterized by flat featureless surface with deposition of alluvial soils in recent geological past brought by rivers originating in Himalayas. Basically it is a flat featureless plain but spatial variation is also experienced in surface configuration. It is a gently sloping plain with elevations ranging from 273m in north and 259m in south thus having a range of 14m indicating gentle slope. It has a mean elevation of about 256m and gently slopes from North-East towards South-West. The elevations are higher in east than west. The terrain is flat and featureless. Being alluvial in origin, its soils are well drained and are very fertile.

2. Climate and Rainfall

33. The climate of Fatehgarh Sahib District is characterized by its general dryness (except in the south-west monsoon season), a hot summer and a bracing cold winter. The year may be divided into four seasons. The period from about middle of November to February is the cold season. This is followed by the summer season from March to about the end of June. The south-west monsoon season commences late in June and continues up to about middle of September. The period from mid-September to the middle of November constitutes the post-monsoon or transition season. The temperature ranges from a minimum of 4°C in winter to 45°C in summer. May and June are generally hottest months and December and January are the coldest months. Relative humidity is high, averaging about 70 percent during monsoon. The

average annual rainfall in the district is about 489.4 mm. About 80 percent of the annual rainfall is received during the period from June to September.

3. Soil

34. Soils in the district are loamy sand at the surface and calcareous sandy loam in subsurface layers. Sand constitutes for 80% in the soil profile. Silt constitutes 11% and clay 9% in the soils. Soil in some parts of the district is saline, deficient in micronutrients, an impermeable sub-soil layer has developed due to continuous cultivation of paddy crop, very less crop residue is incorporated in the soil, which affects the crop yield adversely.

4. Geology

35. The Fatehgarh Sahib district is underlain by formations of Quaternary age comprising of alluvium deposits belonging to vast Indus alluvial plains. Sub surface geological formations comprise of fine to coarse grained sand, silt, clay and kankar. Groundwater exploration carried out by the Central Groundwater Board (CGWB), shows that the presence of the alluvium is in the form of bed rock having a thickness of 550m. Subsurface geological formations show the existence of a top layer of 10 to 15 m of clay, kankar with sand lenses. This layer is followed by granular zones of 20 to 30 m in thickness and under laid by clay bed of 10 to 20 m in thickness. At a depth of 90 to 120 m another clay bed of 25 to 30 m in thickness exists. In general the thickness of finer sediments increases below 100 m in the eastern part of the district.

5. Surface Water Quality

36. The sub project district does not have any perennial rivers; it is supported by the canals from the River Sutlej. The secondary information on the surface water quality collected from the Punjab State Road Sector Projects has been utilized for discussing the surface water quality of the sub project district. The surface water sample has been collected from the canal, which traverses through the Fatehgarh Sahib District.

Table 2: River Sutlej Surface Water Quality

Sl.No	Parameters	Canal at Sirhind – Patiala Road (28+200km)	CPCB Norms for Surface Waters
1.	Temperature (°C)	17.5	40
2.	Dissolved Oxygen(D.O.) (mg/l)	8.1	> 4
3.	pH	7.2	6.5-8.5
4.	Conductivity (µmhos/cm)	476	-
5.	Biochemical oxygen demand (B.O.D.) (mg/l)	1.6	< 3 mg/l
6.	Nitrate- N (mg/l)	1.2	-
7.	Nitrite-N (mg/l)	4.5	-
8.	Fecal Coliform (MPN/100ml)	465	< 2500
9.	Total Coliform (MPN/100ml)	1833	< 5000

Source: Environmental Impact Assessment, Punjab State Road Sector Projects

37. From the given information, the water quality of the canal is observed to be good in comparison with CPCB surface water norms. However, the presence of the Fecal and Total Coliforms indicates the canal water has been polluted due to the influx of sewage or some anthropogenic activities.

6. Groundwater Quality

38. Groundwater samples across the Fatehgarh District has been collected and analyzed for its quality. The study has been conducted by the Central Groundwater Board (CGWB) and the outcome of the analysis has been discussed in this section. The chemical quality of groundwater of shallow aquifer shows that all parameters are within the permissible limits for drinking purpose set by the BIS, 1991. In deeper aquifers the ground water is slightly alkaline in nature. The pH values of ground water vary from 8.22 to 8.60. As per geo-chemical classification, the shallow ground water is Ca Mg- HCO_3 type. Such water has temporary hardness. Suitability for irrigation purposes involves the salinity, Sodium Adsorption Ratio (SAR), Residual Sodium Carbonate (RSC) and Boron. Majority of groundwater samples fall in C3S1 category (Specific Conductance and Sodium Adsorption ratio), rest fall in C2S1 category, which are within the permissible level. Similarly RSC and Boron are within the safe limit for irrigation purposes.

7. Ambient Air Quality

39. Under the Punjab State Road Sector Projects, ambient air quality (AAQ) has been assessed for one of its project roads (Sirhind to Patiala road), which traverses through the Fatehgarh Sahib. Hence, the information given in the EIA report has been utilized to discuss the air quality of the sub project area.

Table 3: Ambient Air Quality Monitoring – Fatehgarh Sahib

Location	SPM µg/m^3	RPM µg/m^3	SO µg/m^3	NO µg/m^3	CO mg/m^3
AAQ-1 (Near NH-1)	224	55	11	17	1.14
AAQ-2 (Jhikwali Village)	177	52	11	17	0.69
AAQ-3 (Barna)	216	53	14	20	1.07

Source: EIA Report, Punjab State Road Sector Projects

40. It is observed from the analysis, that the key noxious air pollutants like sulphur di-oxide and oxides of nitrogen are well within the permissible limits set by the CPCB. However, the concentration of SPM is relatively high for residential areas in comparison with the standard. This may be due to the moving traffic and other anthropogenic activities.

8. Ambient Noise Quality

41. The information on the noise quality for the district was very limited. The secondary information on ambient noise quality has been taken from the Environmental Assessment report carried out for Punjab State Road Sector Projects (PSRSP) in Fatehgarh Sahib for discussion. The noise quality information is depicted in the

42. **Table 4**.

Table 4: Ambient Noise Quality

Sl.no	Location	Land use	Noise Levels dB(A)	
			Daytime	Night time
1	Junction with NH-I	Commercial	72.40	56.21
2	Jhikwali Village	Residential	70.98	52.31
3	Baran	Commercial	72.80	54.89
4	Educational Institute	Sensitive	69.95	51.11

Source: EIA Report, Punjab State Road Sector Projects

43. From the analysis it is observed that the daytime noise levels exceed the stipulated CPCB noise standards for various type of land use. The increase in the daytime noise level may be due to the movement of vehicle traffic and other commercial activities happening near the settlements. However, the night time noise levels are well within the standards.

9. Ecological Resources

44. **Flora**: The floral diversity consists of scattered Khair (*Acacia catechu*), Chhal (*Anogeisus latifolia*), Jhingan (*Lanea grandis*), Kikar (*Acacia nilotica*) Phalahi (*Acacia modesta*), Ber (*Zizyphus mauritiana*), shisham (*Dalbergia sisoos*), neem (*Azadirachta Indica*), mango(*Mangifera indica*), dhak (*Butea monosperma*) etc., Shrubs such as garna (*Carissa spinarum*), mehnder (*Dodona viscasa*), mallah (*Zizyphus nummularia*) gandhala (*Marraya koenigil*), basuti (*Adathoda vasica*), jhav(*Artemesia spp*), hins (*Capparis decidua*), panwar (*Cassia tara*), phul buti (*Lantana camara*), etc. and grasses such as (*Saccharum bengalenese*).

45. The forest strips have mostly artificially raised plantations like shisham (Dalbergia sissoo), eucalyptus (*Edcalyptus spp*), siris (*Albizzia lebbek*), mango (*Mangifera indica*) jaman (*Syzygium communi*) tun (*Cedrela toona*) neem (*Azadiachta indica*). Some of the mixed plantations are amaltas (*Cassia fistula*) jacranda (*Jacranda ovalifolia*), kachnar (*Bauhinca variegata*), bottle brush (*Callistemon vimnalis*) gulmohar (*Delomix rigia*) amla (*Emblica officivalis*) etc.

46. **Fauna**: The main animals found in these areas are Blue Bull (*Boselaphus tragocamelus*), Wild boar (*Sus scrofa*), Sambhar (*Cervas unicolor*), Jackal (*Canis aureus*), Common Mongoose (*Herpestes spp.*), Indian Porcupine (*Hystrix indica*) and Rhesus Monkey (*Macaca mulatta*) etc.

47. The common birds found in the district are :*Phalacrocorax niger* (vieillot), *Butorides striatus chloriceps* (Bonaparte), *Ardeola grayii* (sykes), *Bubulcus ibis coromandus* (Boddaert), *Egretta alba modesta* (Gray), *E. garzetta* (Linnaeus), *Anastomus oscitans* (Boddaert), *C. ciconia* (Linnaeus), *C. migra* (Linnacus), *Tadorna ferruginea* (pallas), *T tadorna*(Linnaeus), *Nettapus coromandelianus* (Gmelin), *Haliaeetus leucoryphus* (Pallas), *Coturnix coromandelica* (Gmelin), *T. stagnatili* (Bechastein), *S. pagodrum*(Gmelin), *Chrysomma sinense* (Gmelin).

B. Social Profile

1. Population Distribution

48. As per Census 2011, Punjab population is 2.77 crores, which shows an increase in the population in comparison with the Census 2001 (2.44 crores). Total population of the Fategarh Sahib District is 6.00 lakh in 2011 which was 5.38 lakh in 2001. However, the district population growth shows a down trend in Average Annual Growth Rate (AAGR) of nearly 1.1 percent. As per the census 2011, the total number of HH in the district is 118100. The Average Household (HH) size has been reduced from 5.8 (census 2001) to 5.1 (census 2011).

2. Urban and Rural Population

49. The urban population in Punjab during 2001 was 33.9% which has increased to 37.5% in 2011. The urban population in Fatehgarh Sahib District is 28% as per 2001census which is increased to 31%in 2011 census. The **Table 5** below presents the Population distribution of the State and the Fategarh Sahib District.

Table 5: Population Distribution – Fatehgarh Sahib

Population Distribution	2001		2011	
	Punjab	Fategarh Sahib	Punjab	Fategarh Sahib
Area (Sq.km)	50362	1180	50362	1180
Avg. HH size	5.6	5.8	5.0	5.1
Tot Population	24358999	538041	27743338	600163
AAGR 2001-2011	1.8	1.7	1.3	1.1
Tot Urban Pop	8262511	151091	10399146	185482
Tot Rural Pop	16096488	386950	17344192	414681
% of Urban Population	33.9	28	37.5	31

Source: Compiled from Primary Census Abstract, 1991, 2001 and 2011

3. Population Density

50. Population Density of Punjab is 551 per sq.km in 2011. Density of Fategarh Sahib is 509 per sq.km in 2011, which is higher than the value of 2001 census (456 Sq.km).

4. Sex Ratio

51. As per census 2011, the sex ratio of the state was 895 females per 1000 males. Whereas it was 874 females per 1000males in 2001. In the Fatehgarh Sahib District it was 871 females per 1000 males, which is higher than the 2001 figures (854 females per 1000 males).

5. Literacy Rate

52. The average literacy rate for the Fategarh Sahib District is 79.4% as per 2011 census which is higher in comparison to the Punjab state average of 75.8%. The district itself has a considerable growth in the literacy rate in comparison to the 2001 census (73.6%).

6. Work participation Rate

53. As per census 2011, the Workforce Participation Rate in the Fategarh Sahib District is 36 percent, which is similar to the Punjab state average of 36 percent. Fategarh Sahib District Workforce Participation was 38 percent in 2001 now it has decreased to 36 percent.

7. Social Characteristics

54. There is no ST population in the Punjab state. The percentage of the SC in the Punjab state as well as the Fatehgarh Sahib District constitutes to 32% (as per census 2011).The table below presents the Demographic status of the Punjab state and the Fategarh Sahib district.

Table 6: Social Characteristic – Fatehgarh Sahib

Social component	2001		2011	
	Punjab	Fategarh Sahib	Punjab	Fategarh Sahib
Population Density	484	456	551	509
Sex Ratio	874	854	895	871
Literacy Rate	69.7	73.6	75.8	79.4
Workforce Rate (WPR)	37	38	36	36
% of SC	29	31	32	32

Source: Compiled from Primary Census Abstract, 2001& 2011

V. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

55. The assessment of environmental impacts for the proposed interventions under this package has been carried out during the preparation of summary appraisal report (SAR). An environmental assessment as per preliminary design using ADB's Rapid Environmental Assessment (REA) checklist for urban development (Annex 1) was conducted. The following are categories of impacts assessed:

(i) **Location impacts**. Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities and wildlife
(ii) **Design impacts**. Impacts arising from project design, including the technology used, scale of operations, discharge standards etc.
(iii) **Construction impacts**. Impacts resulting from construction activities including site clearance, earthworks, civil works, etc.
(iv) **O&M impacts**. Impacts associated with the operation and maintenance of the infrastructure built in the project.

56. **Land Acquisition and Resettlement Impacts**. The sites of subproject components are planned to be developed in the government-owned land (Public Works Department and Department of Cultural Affairs, Archaeology and Museums, Punjab). However, the chances of land acquisition may arise if the approach road has been planned for the monuments (Tomb of Raffudin and Tomb of Alfsani). In the event of any land acquisition or resettlement requirements during the project implementation, the same shall be carried out in line with provision of the Resettlement Framework developed for the project and will be detailed in the Social Assessment Report.

57. **Design Considerations to Avoid Environmental Impacts.** The following are design considerations to avoid environmental impacts:

- Incorporation of adequate drainage provisions
- Design, material and scale will be compatible to the local architectural, physical, cultural and landscaping elements
- Preference will be given to the use of local material and labour as best as possible; (iii) for conservation, local construction material available in the nearby region as best as possible suiting to those in existenc
- All painting (interior and exterior) will be with environment-friendly low volatile organic compounds paints
- For any retaining wall repair works, random rubble masonry will be used, with locally available stone to be laid in cement mortar by local skilled labour
- Earth backfill, if any will be done from the site excavated material
- Ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

58. The results of interventions are unobtrusive and will be integral part of the ambience of the site. The physical components have been proposed with minimalist design treatment emphasising use of local materials (wood, stone) as defined in the management plan of the area.

A. Assessment of Environmental Impacts

59. **Determination of Area of Influence.** The area of influence is (i) sites for proposed project components; (ii) main routes/intersections which will be traversed by construction vehicles; and (iii) quarries and borrow pits as sources of construction materials.

60. In the case of this subproject Package No. PB/IDIPT/T3/03-12/02 the components will involve straight forward construction and operation, and impacts will be mainly localized, short in duration and expected only during construction period. During the construction phase, impacts mainly arise from the need to dispose of moderate quantities of waste soil; and from the disturbance of residents, businesses, and traffic. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation. Measures such as conducting work in lean season and minimizing inconvenience by best construction methods will be employed. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. Facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only.

B. Pre-construction Impacts and Mitigation Measures

61. **Consents, Permits, Clearances, No Objection Certificate (NoC), etc**. Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works. The following will be conducted during detailed design phase:

- Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.
- Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.
- Include in detailed design drawings and documents all conditions and provisions if necessary
- Utilities. Interruption of services (water supply, electricity, toilets etc.) will be scheduled and intermittently related to localized construction activities. To mitigate impacts, PIU/DSC will:
- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase.
- Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
- Require contractor to obtain from the PIU and/or DSC the list of affected utilities and operators;
- If relocations are necessary, contractor along with PIU/DSC will coordinate with the providers/line agencies to relocate the utility.

Table 8: Status Of NOCs And Undertakings Obtained From Asset Owners

S.No.	Sub-Project Component	Asset Owner	NOC / Undertaking	Date of Issue
1	Management and reuse plan of Aam Khas Bagh including Conservation of Boundary Wall and Providing visitors facilities at arts and craft centre	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	NOC	28.08.2014
2	Management and reuse plan of Aam	Director, Central Affairs	Undertaking	28.08.2014

S.No.	Sub-Project Component	Asset Owner	NOC / Undertaking	Date of Issue
	Khas Bagh including Conservation of Boundary Wall and Providing visitors facilities at arts and craft centre	Archaeology & Museum, Punjab, Chandigarh		
3	Conservation and site Development of Tomb of Rafuddin, Village-Talanian, Sirhind.	Divisional Magistrate, Fatehgarh Sahib	NOC	27.09.2014
4	Conservation and site Development of Tomb of Rafuddin, Village-Talanian, Sirhind.	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	NOC & Undertaking	27.09.2014
5	Conservation and site Development of Tomb of Alafsani, Village-Talanian, Sirhind.	Divisional Magistrate, Fatehgarh Sahib	NOC	
6	Conservation and site Development of Tomb of Alafsani, Village-Talanian, Sirhind.	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	NOC & Undertaking	27.09.2014
7	Conservation and site Development of Tomb of Bibi Taj and Tomb of Dera Mir Meera at Distt. Fatehgarh Sahib.	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	NOC	04.09.2013
8	Dargah Rouza Sharif at Sirhind	Khalifa Syed Mohd. Sadiq Raja, Sajjada Nashin Dargah, Rauza Sharief at Sirhind	NOC	26.08.2013

62. **Social and Cultural Resources**. There is a risk, that any work involving ground disturbance can uncover and damage archaeological and historical remains. However, the quantum of work involved in this conservation/restoration works is minimal and site specific. Hence the impacts on the social and cultural resources are not anticipated. However, the PIU/DSC shall consult the archeological department for assisting in implementing this subproject. The following mitigation shall be adopted by the PIU/DSC:

- Consult Archaeological Survey of India and/or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site.
- Consider alternatives if the site is found to be of medium or high risk.
- Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available.
- Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds (Chance find protocol attached as Appendix 11) are recognized and measures are taken to ensure they are protected and conserved

63. **Sites for Construction Work Camps and Areas for Stockpile, Storage and Disposal.** The priority is to locate the construction camp; storage and area of stockpile are adjacent/ near to the subproject sites. The contractor will be required to meet the following criteria for the sites:

- Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc.
- Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust,

and noise, and to prevent social conflicts, shortages of amenities, and crime).
- Disposal will not be allowed in to nearby water course or any nearby sensitive areas which may pollute surface water or can inconvenience the community.
- The construction camp, storage of fuel and lubricants should be avoided at the river bank. Any construction camp site will be finalized in consultation with DSC and PIU.

64. **Sources of construction materials.** Moderate amounts of gravel, sand, and cement will be required for this subproject. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. The contractor will be required to:

- Use quarry sites and sources permitted by government.
- Verify suitability of all material sources and obtain approval from PIU/DSC.
- If additional quarries are required after construction has started, obtain written approval from PIU/DSC.
- Submit to PIU/DSC on a monthly basis documentation of sources of materials.

65. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of PIU/DSC. If additional quarries are required after construction is started, then the contractor obtains written approval of PIU.

66. **Erosion control.** Most of the impacts will occur due to excavation and earth movements during construction phase. Prior to commencement of civil works, the contractor will be required to:

- Apart from the archaeologists, consult a certified geologist to look into soil stability to enable contractors to employ effective soil stabilization and erosion control measures to sustain restorative measures under the subproject
- Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality.
- Minimize the potential for erosion by balancing cuts and fills to the extent feasible.
- Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).
- Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal

67. **Utilities.** Interruption of services (water supply, toilets, bathing areas, etc.) will be scheduled and intermittently related to localized construction activities. To mitigate impacts, PIU/DSC will:

- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase.
- Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
- Require contractor to obtain from the PIU and/or DSC the list of affected utilities

and operators;

- If relocations are necessary, contractor along with PIU will coordinate with the providers to relocate the utility
- Require contractor to specify condition of general housekeeping (storage of construction implements, stockpiles, wastes, chemicals) in order to ensure compliance with environmental laws and provide reference for monitoring purposes

68. **Access.** Hauling of construction materials and operation of equipment on-site can cause traffic problems. Construction traffic will access most work areas from the existing roads therefore potential impacts will be of short-duration, localized and can be mitigated. The contractor will need to adopt the following mitigation measures:

- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
- Schedule transport and hauling activities during non-peak hours.
- Locate entry and exit points in areas where there is low potential for traffic congestion.
- Keep the site free from all unnecessary obstructions.
- Drive vehicles in a considerate manner.
- Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours.
- Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints.

69. **Summary of pre-construction** activities is presented in **Table** . The responsibilities, monitoring program and costs are provided in detailed in the EMP. The contractor is required to update the information during detailed design phase. Sample waste/spoils management plan, traffic management plan, etc. are attached as **Annexes 4 & 5.** Site-specific plans will be developed as per detailed design.

Table 9: Summary of Pre-Construction Mitigation Measures

Parameters	Mitigation Measures
Consents, permits, clearances, no objection certificate (NOC), etc.	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. • Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. • Include in detailed design drawings and documents all conditions and provisions if necessary
Social and Cultural Resources	• Consult Archaeological Survey of India or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site. • Consider alternatives if the site is found to be of medium or high risk. • Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol (Appendix 11) for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.

Parameters	Mitigation Measures
Sites for construction work camps, areas for stockpile, storage and disposal	• Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc. • Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). • Disposal will not be allowed near sensitive areas which will inconvenience the community. • The construction camp, storage of fuel and lubricants should be avoided at the river bank. The construction camp site for intake well should be finalized in consultation with DSC and PIU.
Sources of construction materials	• Use quarry sites and sources permitted by government. • Verify suitability of all material sources and obtain approval from PIU/DSC. • If additional quarries are required after construction has started, obtain written approval from PIU/DSC. • Submit to DSC on a monthly basis documentation of sources of materials.
Erosion control	• Apart from the archaeologists, consult a certified geologist to look into soil stability to enable contractors to employ effective soil stabilization and erosion control measures to sustain restorative measures under the subproject • Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality. • Minimize the potential for erosion by balancing cuts and fills to the extent feasible. • Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). • Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.
Utilities	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase. • Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Obtain from the PIU and/or DSC the list of affected utilities and operators; • Prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • If relocations are necessary, contractor will coordinate with the providers to relocate the utility. • Require contractor to specify condition of general housekeeping (storage of construction implements, stockpiles, wastes, chemicals) in order to ensure compliance with environmental laws and provide reference for monitoring purposes.
Access	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion. • Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner. • Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided

Parameters	Mitigation Measures
	during peak hours. • Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints. • Provide free access to households and businesses/shops along ROWs during the construction phase.

C. Anticipated Construction Impacts and Mitigation Measures

70. The impacts during the proposed construction works are generic to the construction activities and not expected to be significant. The EMP specifies the necessary mitigation measures to be strictly followed by the contractor and supervised by the DSC. Key impacts during construction are envisaged on the following aspects: (i) transportation of materials, (ii) dust generation, air and noise pollution from construction activities, (iii) handling of construction materials at site and, (iv) adoption of safety measures during construction.

71. **Construction Schedule and Method**. As per preliminary design, construction activities will cover approximately 2 years (24 months). The exact implementation schedule will be updated during detailed design phase and will be reflected in this IEE. The infrastructures will be constructed manually according to design specifications. Demolished materials will be reused to the maximum extent possible. Materials will be brought to site by trucks and will be stored on unused areas/ vacant areas near to the heritage/ monuments site. Any excavated road will be reinstated. The working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Night works shall not be permitted.

72. **Erosion Hazards**. As per the reconnaissance survey, the subproject components on the monuments (tombs) are potential to have erosion hazard. This is due to the subproject site has been altered by the agricultural activities leaving the tombs isolated from surrounding areas. Hence any activities on excavation shall lead to erosion; hence the contractor is advised to carry out the construction activities in the non-monsoon seasons. The contractor will be required to:

- Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so.
- Use dust abatement such as water spraying to minimize windblown erosion.
- Provide temporary stabilization of disturbed/excavated areas that are not actively under construction.
- Apply erosion controls (e.g., silt traps) along the drainage leading to the water drains.
- Maintain vegetative cover within unused land to prevent erosion and periodically monitor the area to assess erosion.
- Clean and maintain catch basins, drainage ditches, and culverts regularly.
- Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems

73. **Impacts on Water Quality**. There are no surface water sources near the subproject site therefore impacts on water quality is negligible. Nevertheless, the contractors will be required to:

- Schedule civil works during non-monsoon season, to the maximum extent possible.
- Ensure drainages within the construction zones are kept free of obstructions.

- Keep loose soil material and stockpiles out of drains and flow-lines.
- Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.
- Re-use/utilize, to maximum extent possible, excavated materials.
- Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites).
- Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.

74. **Impacts on Air Quality**. There is potential for increased dust particularly during summer/dry season due to various construction activities including stockpiling of construction materials. Emissions from vehicles transporting workers, construction materials and debris/materials to be disposed may cause increase in air pollutants within the construction zone. These are inherent impacts which are site-specific, low magnitude, short in duration and can be easily mitigated. The contractor will be required to:

- Conduct regular water spraying on earth piles, trenches and sand piles.
- Conduct regular visual inspection along alignments and construction zones to ensure no excessive dust emissions.
- Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed areas cannot be done immediately.
- Maintain construction vehicles and obtain “pollution under control” (PUC) certificate from PSPCB.
- Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the project.

75. **Noise and Vibration Impacts**. The civil works proposed in the subproject components shall be implemented manually, the use of heavy equipment is limited and hence noise and vibration impacts are not anticipated. Nevertheless the contractor will be required to:

- The construction activities having excess noise shall be performed during the day time.
- Plan activities in consultation with the PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.
- Minimize noise from construction equipment by using vehicle silencers and by fitting jackhammers with noise-reducing mufflers.
- Avoid loud random noise from sirens, air compression, etc.
- Train the drivers to ensure that they do not honk unless it is necessary to warn other road users or animals of the vehicle’s approach.
- If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the DSC:
    - Locate stationary construction equipment as far as possible from nearby noise-sensitive areas.
    - Turn off idling equipment.
    - Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
    - Notify nearby residents whenever extremely noisy work are planned.
- Follow Noise Pollution (Regulation and Control) Rules, 2000, day time ambient

noise levels should not exceed 65 dB(A) in commercial areas, 55 dB(A) in residential areas and 50 dB(A) in silence zone.[6]

- Ensure vehicles comply with Government of India noise regulations for vehicles. The test method to be followed shall be IS: 3028-1998.

76. **Impacts on Flora and Fauna**. As per preliminary design, tree-cutting is not required. However, the wild vegetation surrounding the heritage / monuments has to be removed. This will be reassessed during detailed design phase. There are no protected areas, areas having ecological biodiversity in the vicinity of the subproject area and indirect impact zones and thus no impacts on flora and fauna will be envisaged. But in general the contractor will be required to:

- Conduct site induction and environmental awareness.
- Limit activities within the work area.
- Do not remove or harm existing vegetation except required under proposed contract
- Strictly instruct workers not to cut trees for fuel wood.
- Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department.

77. **Impacts on Physical and Cultural Resources**. There may be inconvenience to tourists, residents, businesses, and other road users due to construction activities in the proposed area. This potential impact is site-specific, short-term and can be mitigated. The contractor will be required to:

- Ensure no damage to structures/properties near construction zone.
- Provide walkways and metal sheets where required to maintain access of people and vehicles.
- Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Implement good housekeeping. Remove wastes immediately. Prohibit stockpiling of materials that may obstruct/slow down pedestrians and/or vehicle movement.
- Ensure workers will not use nearby/adjacent areas as toilet facility.
- Coordinate with DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc.
- Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
- Provide instructions on event of chance finds (Appendix 11) for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.

78. **Impact due to Waste Generation**. Construction activities will produce excavated soils construction materials, and solid wastes (such as removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items). These

[6] Day time shall mean from 6.00 am to 10.00 pm. Silence zone does an area comprise not less than 200 meters around eco sensitive areas, hospitals, educational institutions, courts, religious places or any other area which is declared as such by PPCB. Mixed categories of areas may be declared as one of the above mentioned categories.

impacts are negative but short-term and reversible by mitigation measures. The contractor will need to adopt the following mitigation measures:

- Prepare and implement a waste management plan.
- Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas.
- Coordinate with the local municipal authorities for beneficial uses of demolished materials or immediately dispose to designated areas.
- Recover used oil and lubricants and reuse; or remove from the sites.
- Avoid stockpiling and remove immediately all demolished materials, excess construction materials, and solid waste (removed concrete, wood, packaging materials, empty containers, oils, lubricants, and other similar items).
- Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.

79. **Impacts on Occupational Health and Safety.** Workers need to be mindful of occupational hazards which can arise from construction works. Exposure to work-related chemical, physical, biological and social hazard is typically intermittent and of short duration, but is likely to reoccur. Potential impacts are negative and long-term but reversible by mitigation measures. Overall, the contractor should comply with IFC EHS Guidelines on Occupational Health and Safety (this can be downloaded from http://www1.ifc.org/wps/wcm/connect/9aef2880488559a983acd36a6515bb18/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES). The contractor will be required to:

- Disallow worker exposure to noise level greater than 85 dB(A) for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.
- Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents.
- Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers.
- Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps.
- Provide medical insurance coverage for workers.
- Secure construction zone from unauthorized intrusion and accident risks.
- Provide supplies of potable drinking water.
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do

not enter hazard areas unescorted.

- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.
- Ensure moving equipment is outfitted with audible back-up alarms.
- Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.

80. **Impacts on Socio-Economic Activities**. Manpower will be required during the 24 months construction phase. This can help generate contractual employment and increase in local revenue. Thus potential impact is positive and long-term. As per preliminary design, land acquisition and closure of roads are not required. However, construction activities may impede access of residents and customers to shops. The potential impacts are negative and moderate but short-term and temporary. The contractor will need to adopt the following mitigation measures:

- Provide sign boards for visitors to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Employ at least 50% of the labor force, or to the maximum extent, local persons within the 20km immediate area if manpower is available.

81. **Summary of Mitigation Measures during Construction**.

82. **Table** provides summary of mitigation measures to be considered by the contractor during construction phase. The detailed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related implementation arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators are provided in the EMP.

Table 10: Summary of Mitigation Measures during Construction Phase

Potential Impact	Mitigation Measures
Impacts on water quality	• Schedule civil works during non-monsoon season, to the maximum extent possible. • Ensure drainages within the construction zones are kept free of obstructions. • Keep loose soil material and stockpiles out of drains and flow-lines. • Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets. • Re-use/utilize, to maximum extent possible, excavated materials. • Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites). • Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.
Impacts on air quality	• Conduct regular water spraying on earth piles, trenches and sand piles. • Conduct regular visual inspection along alignments and construction zones to ensure no excessive dust emissions. • Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed areas cannot be done immediately. • Maintain construction vehicles and obtain “pollution under control” (PUC) certificate from PPCB. • Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if it is required for this project.

Potential Impact	Mitigation Measures
Noise and vibrations impacts	• The construction activities having excess noise shall be performed during the day time. • Plan activities in consultation with the PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. • Minimize noise from construction equipment by using vehicle silencers and by fitting jackhammers with noise-reducing mufflers. • Avoid loud random noise from sirens, air compression, etc. • Train the drivers to ensure that they do not honk unless it is necessary to warn other road users or animals of the vehicle's approach. • If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the DSC: o Locate stationary construction equipment as far as possible from nearby noise-sensitive areas. o Turn off idling equipment. o Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. o Notify nearby residents whenever extremely noisy work are planned. • Follow Noise Pollution (Regulation and Control) Rules, 2000, day time ambient noise levels should not exceed 65 dB(A) in commercial areas, 55 dB(A) in residential areas and 50 dB(A) in silence zone.[7] • Ensure vehicles comply with Government of India noise regulations for vehicles. The test method to be followed shall be IS:3028-1998.
Impacts on flora and fauna	• Conduct site induction and environmental awareness. • Limit activities within the work area. • Do not remove or harm existing vegetation except required under proposed contract • Strictly instruct workers not to cut trees for fuel wood. • Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department
Impacts on physical resources	• Ensure no damage to structures/properties near construction zone. • Provide walkways and metal sheets where required to maintain access of people and vehicles. • Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints. • Implement good housekeeping. Remove wastes immediately. Prohibit stockpiling of materials that may obstruct/slow down pedestrians and/or vehicle movement. • Ensure workers will not use nearby/adjacent areas as toilet facility. • Coordinate with PIU/DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc. • Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.
Impacts on	• Prepare and implement a waste management plan. Manage solid waste according

[7] Day time shall mean from 6.00 am to 10.00 pm. Silence zone does an area comprise not less than 200 meters around eco sensitive areas, hospitals, educational institutions, courts, religious places or any other area which is declared as such by PPCB. Mixed categories of areas may be declared as one of the above mentioned categories.

Potential Impact	Mitigation Measures
waste generation	to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas. • Coordinate with Municipal Authorities for beneficial uses of demolished materials/silts/sediments or immediately dispose to designated areas. • Recover used oil and lubricants and reuse; or remove from the sites. • Avoid stockpiling and remove immediately all demolished materials, excess construction materials, and solid waste (removed concrete, wood, packaging materials, empty containers, oils, lubricants, and other similar items). • Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.
Impacts on occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project. • Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. • Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers. • Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps. • Provide medical insurance coverage for workers. • Secure construction zone from unauthorized intrusion and accident risks. • Provide supplies of potable drinking water. • Provide clean eating areas where workers are not exposed to hazardous or noxious substances. • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted. • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas. • Ensure moving equipment is outfitted with audible back-up alarms. • Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.
Impacts on socio-economic activities	• Provide sign boards for visitors to inform nature and duration of construction works and contact numbers for concerns/complaints. • Employ at least 50% of the labor force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available. • “Mobility Plan” has to be chalked out in consultation with the District Administration prior to start of work.

83. The construction related impacts due to proposed subproject components are generic to construction activities, and are typical of building and other construction projects. The potential

impacts that are associated with construction activities can be mitigated to standard levels without difficulty through incorporation or application of the recommended mitigation measures and procedures.

D. Post-Construction Impacts and Mitigation Measures

84. Site clean-up is necessary after construction activities. The contractor will be required to:

- Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase.
- Use removed topsoil to reclaim disturbed areas.
- Re-establish the original grade and drainage pattern to the extent practicable.
- Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees.
- Restore access roads, staging areas, and temporary work areas.
- Restore roadside vegetation.
- Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites.
- Monitor success of re-vegetation and tree re-planting. Replace all plants determined to be in an unhealthy condition.
- Request in writing from PIU/DSC that construction zones have been restored.

E. Anticipated Operations and Maintenance (O&M) Impacts and Mitigation Measures

85. Impacts on environmental conditions associated with the O&M of the subproject Package No. PB/ IDIPT/ T3/03-12/02 components pertain to impacts related to increased tourists in the areas resulting to increased vehicular movement along the roads, increased demands for services, and increased solid waste generation. These impacts can be mitigated by:

- Increased vehicular movement along the roads shall have speed restrictions, provision of appropriate road signage and well located rest points for pedestrians which shall minimize impacts on safety of the people
- Increase in demands for services shall be addressed through the subproject design
- Increase in solid waste generation shall be mitigated through local municipalities/ panchayat's which shall put up solid waste management programs in place.

F. Cumulative Impact Assessment

86. The cumulative impact assessment examined the interaction between the subproject's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing, and reasonably foreseeable future projects or activities. The interaction of residual effects associated with multiple projects and/or activities can result in cumulative impacts, both positive and negative. The project's potential cumulative effects were considered with respect to valued components in environmental and socioeconomic categories, in four areas:

- of any potential residual project effects that may occur incrementally over time;

- consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the project;
- potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed subproject; and
- future developments that are reasonably foreseeable and sufficiently certain to proceed.

87. The project has identified the valued components as air quality, acoustic environment, socioeconomic and socio-community components, and human health and safety. There are no foreseeable projects that will overlap with the subproject. The spatial boundary of the subproject is the subproject component sites and the temporal boundary can be considered as the whole town of Fatehgarh Sahib.

88. It has been recommended that infrastructures be designed to the current best practice standard and notified Government of Punjab codes and management plans. No negative cumulative impact and the potential long-term environmental impacts are positive.

89. **Air quality.** Emissions of common air contaminants and fugitive dust may be elevated in proximity to active work sites during construction and O&M phases, these impacts will be short-term and localized to the immediate of the sites. Greenhouse gas (GHG) emissions may increase as a result of the subproject activities (i.e., vehicle and equipment operation, concrete production, disposal of excavated material, land-filling of residual wastes). Given the subproject's relatively minor contribution to common air contaminants and GHG emissions during construction, the overall significance rating of both these potential residual and cumulative effects is considered to be negligible.

90. **Acoustic environment.** Noise levels during construction and O&M activities in immediate proximity of work sites are expected to increase. The duration of exposure will be relatively brief and imperceptible. The exposure represents a temporary, localized, adverse residual effect of low significance for affected receptors. While building damage due to ground vibrations is unlikely, there may be annoyance to spatially located receptors during construction and O&M activities. The overall significance rating of potential residual and cumulative effects is considered to be negligible.

91. **Socioeconomic and socio-community.** Concerns on existing provisions for community and tourists will occur spatially during construction and O&M activities. Existing conditions within the subproject sites and immediate surroundings will be improved once the activities are completed. Since the subproject will be improvement of existing infrastructures, it will not conflict with existing or planned land use. However, following improvement in infrastructures and services, added residential developments, commercial, and business facilities and increased densities are expected to develop and enhance the town of Fatehgarh Sahib. This can be considered a long-term cumulative benefit of the subproject.

92. Given the scale of the project it is likely that local people will obtain at least temporary socio-economic benefits, by gaining employment in the construction workforce, and thus raising

their levels of income. These benefits can bring wider social gains if they are directed at vulnerable[8] groups.

93. **Community and workers health and safety.** No adverse residual effects to human health will occur as a result of construction or O&M activities, and mitigation measures are in place to ensure public and worker safety, and will be closely monitored. While exposure to elevated noise levels, fugitive dust and common air pollutants will occur in proximity to work sites, due to their short-term and localized nature, these effects are expected to be minor and insignificant with no measurable effects on human health.

94. Therefore the project will benefit the general public by contributing to the long-term improvement of tourism and community livability in town of Fatehgarh Sahib.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. ADB Disclosure Policy

95. Public consultation was undertaken as per ADB SPS requirements. All the five principles of information dissemination, information solicitation, integration, coordination and engagement into dialogue were incorporated during the task. A framework of different environmental impacts likely from the subproject was prepared based on opinions of all those consulted, especially at the micro level, by setting up dialogues with the local communities from whom information on site facts and prevailing conditions were collected.

96. As per ADB safeguard requirement, public consultation is to be carried out before and after impact identification. Public consultation was therefore carried out twice, once at the time of start of work with the key stakeholders particularly with wildlife/ forest authorities and NGOs, and secondly to discuss mitigating measures and get concurrence of stakeholders.

B. Process for Consultation Followed

97. During the project preparation, consultations have been held with the Department of Tourism, Punjab Heritage and Tourism Promotion Board, Department of PWD, NGOs and also with tourists on issues pertaining to the implementation of the proposed sub-projects. The key issues highlighted during the discussion include the conservation and restoration of the Mughals historical structures in Fatehgarh Sahib. These consultation's (**Table** below) provides the necessary inputs for identifying the required needs of the communities, and the relevant stakeholders.

Table 11: Stakeholder's Consultation

S.No	Place	Date	Participants	Issues discussed
1.	Chandigarh	December 2013	Officials of Tourism Department and other stakeholders	Finalization of project components, environment and social safeguard requirements
2.	Fatehgarh Sahib	December 2013	Officials of forest department, tourism department and Pollution control board	Proposed design elements, clearance requirements, environment and social policies of ADB.

[8] Vulnerable groups as those without legal title to land and other assets; households headed by single earner females, the elderly or disabled; indigenous peoples (based on ADB OM); and households with incomes that are below the poverty line.

S.No	Place	Date	Participants	Issues discussed
3.	Chandigarh	December 2013	Officials of PWD	Proposed design element, NOC/ clearance requirements, environment and social policies of ADB.
4.	Chandigarh	December 2013	Officials of Tourism Department/ Fatehgarh Sahib Municipal Corporation	Role of Environmental and Social safeguard and the necessity of IEE in the project implementation and methodology adopted

C. Plan for Continued Public Participation

98. To ensure continued public participation, a provision to ensure regular and continued stakeholder participation, at all stages during the project design and implementation is proposed. This project does not have any land acquisition or Resettlement and Rehabilitation (R&R) issues. However, in the event of any land acquisition or resettlement requirements during the project implementation, a grievance redressal cell will be set up within the PIU to register grievances of the people regarding technical, social and environmental aspects. This participatory process will ensure that all views of the people are adequately reviewed and suitably incorporated in the design and implementation process. Further, to ensure an effective disclosure of the project proposals to the stakeholders and the communities, an extensive project awareness campaign will be carried out.

99. The public consultation and disclosure program with all interested and affected partied will remain a continuous process throughout the project implementation, and shall include the following:

- **Consultations during construction phase**: (a) public meetings with affected communities to discuss and plan work programs and allow issues to be raised and addressed once construction has started; and (b) smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and to provide a mechanism through which stakeholders can participate in project monitoring and evaluation.
- **Project disclosure**: (a) public information campaigns (via newspaper, flyers, and media) to explain the project to the wider city population and prepare them for disruptions they may experience once construction is underway; (b) public disclosure meetings at key project stages to inform the public of progress and future plans, and to provide copies of summary documents in local language; (c) formal disclosure of completed project reports by making copies available at convenient locations in the study areas, and informing the public of their availability; and (d) providing a mechanism through which comments can be made.

100. For the benefit of the community a summary IEE will be translated in the local language (Punjabi) and made available at: (i) Office of the PMU; and, (ii) Office of the Deputy Commissioner, Fatehgarh Sahib District. These copies will be made available free of cost to any person seeking information on the same. Hard copies of the IEE will be available in the PMU/PIU as well as the district libraries at Fatehgarh Sahib, and accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. On demand, the person seeking information can obtain a hard copy of the complete IEE document from the office of the PMU/PIU such that to cover the cost of photocopy, on a written request and after initiating a payment for the same to the Project Director. Electronic version of the IEE

will be placed in the official website of the Tourism Department and the website of ADB after approval of the documents by Government of Punjab and ADB.

101. The PMU will issue notification on the disclosure mechanism in local newspapers, ahead of the initiation of implementation of the project, providing information on the project, as well as the start dates etc. The notice shall be issued by the PMU in local newspapers one month ahead of the implementation works. This shall create awareness of the project implementation among the public. Posters designed such that it creates mass awareness regarding the basic tenets of the IEE and the same shall be distributed to libraries in different localities that shall be part of such mass campaign.

VII. GRIEVANCE REDRESS MECHANISM

102. The project affected person/aggrieved party can give their grievance verbally or in written to the local grievances committee. Grievances of affected person will first be brought to the attention of the PIU who can resolve the issue at site level. If the matter is not solved within 7 days period by the PIU, it will be brought to the Grievance Redress Committee constituted for the purpose in PIU. This GRC shall discuss the issue in its monthly meeting and resolve the issues within one month of time after receiving the grievance. If the matter is not resolved by GRC at PIU level within stipulated time, it shall be referred to GRC at PMU level by Executive Engineer of PIU.

103. GRC at PMU shall discuss the issue and try to resolve it and inform the PIU accordingly. If the matter is not resolved by the GRC at PMU level within one month of time, the aggrieved person/party can bring the matter to The Court of Law. The PIU shall keep records of all grievances received including contact details of complainant, date of receiving the complaint, nature of grievance, agreed corrective actions and the date these were affected and final outcome. The grievance redress process is shown below:

A. Composition and functions of GRC

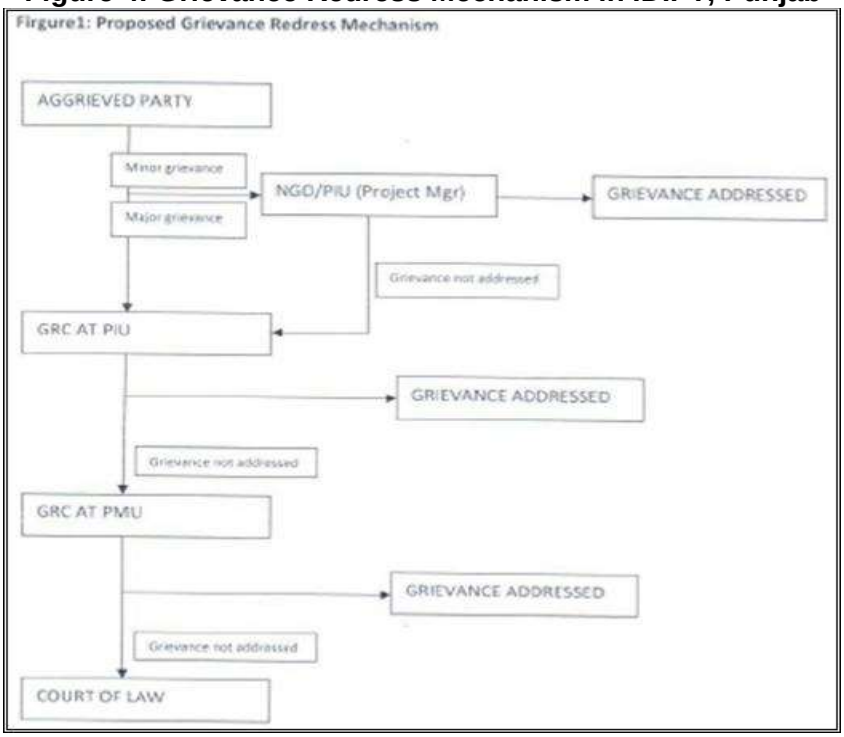
104. **Local Grievance Committee (LGC).** In this LGC has worked with NGO, SHG, Line Agency, representative of Gram Panchayat, Special invitee.

105. **Grievance Redress Committee (GRC) at PIU.** In each PIU there shall be one GRC, which will include Project Manager (PIU), District Tourist Officer of the Punjab Heritage & Tourism Promotion Board, Govt. of Punjab, Community Development Officer of PIU, nominated representative of District Magistrate and nominated representative committee shall be headed by Project Manager (PIU). The committee will meet at least once in every month. Agenda of meeting shall be circulated to all the members and affected persons/aggrieved party along with venue, date and time; informed in written at least 7 days in advance of meeting. The matters shall remain with GRC at PIU level for one month and if grievance is not resolved within this time period, the matter shall be referred to GRC at PMU.

106. **GRC within Environmental and Social Management Cell (ESMC) at PMU**. There shall be one GRC in PMU. The matters not resolved by the GRC at PIU level within one month shall come under GRC at PMU. GRC at PMU will include Community Development Expert of PMU, Safeguard Specialist of PMU and Additional Project Director (APD) of PMU. The Committee shall be headed by APD of PMU. This committee shall look the matters, which are referred to and not resolved by GRC at PIU level. If the matter is not resolved by the GRC at

PMU level within one month of time, the aggrieved person/party can bring the matter to The Executive Committee/State Level Empowered Committee (SLEC).

Figure 4: Grievance Redress Mechanism in IDIPT, Punjab



Note: LGC -NGO, SHG, Line Agency, Representative of Gram Panchayat, Special invitee GRC – PM, CDO, Engineer, DFO, DTO, SDM GRC in Environment and Social Management Cell (ESMC) –PMU (APD, SS, CDS, FS), PMC (EE, CDE)

107. **Approach to GRC.** Affected person/aggrieved party can approach to GRC for redress of his/their grievances through any of the following modes:

- Web based: A separate corner will be developed at the program website so that public / community/ affected person can register their complaint in the online column.
- Telecom based: A toll free no. Will be issued by the PMU/ PIU so that general public can register their complaint through telephone / mobile phone to the PIU/PMU office.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

108. The purpose of the Environmental Management Plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

109. A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the

contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

110. The contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that PMU and PIU will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

A. Responsibilities for EMP Implementation

111. The following agencies will be responsible for EMP Implementation:

- Department of Tourist, Government of Punjab is the executing agency responsible for overall management, coordination, and execution of all activities funded under the loan. Punjab Heritage and Tourism Promotion Board is the implementing agency responsible for coordinating procurement and construction of the project.
- Project Management Unit (PMU) is set up in Chandigarh to coordinate the overall execution. Project Management Consultant (PMC) in Chandigarh provides assistance to PMU in execution, including procurement and assures technical quality of design and construction.
- A Project Implementation Unit (PIU) is established in Amritsar for subprojects in Patiala District. This PIU will look into progress and coordination of day to day construction works with the assistance of DSC, who will prepare the detailed project report (DPR) of the subproject and will carry out construction supervision during project implementation. Their responsibility will also include updating this IEE based on detailed design and EMP implementation supervision;
- The contractor will be responsible for execution of all construction works. The contractor will work under the guidance of the PIU Amritsar and DSC. The EMP mitigation measures relevant to construction phase will also be implemented by the contractor.

112. The contractor's conformity with contract procedures and specifications during construction will be carefully monitored by the PIU. Safeguard Specialists are deputed in PMU, PMC and DSC, who will monitor the environmental performance of contractors. Terms of References of Safeguards Specialists are given in boxes below.

Box 1: Terms of Reference of Safeguards Specialist – PMU
• A working knowledge of India's national environmental policies and ADB SPS to reconcile parallelism and compliance between the two policy frameworks. • Review the IEE document and ensure adequacy under Safeguard Policy Statement, 2009 and identify any areas for improvement. • Ensure that the project design and specification adequately reflect the IEE, co-ordinate the obtaining of requisite environmental clearances for the project • Monitor construction activities to ensure that identified and appropriate control measures are effective and in compliance with the IEE and advise PIU for compliance with statutory requirements. • Develop training programme for the PMU/PIUs staff, the contractors and others involved in the project implementation, in collaboration with the Environmental Specialist of the PMC and DSC • Review and approve the Contractor's Implementation Plan for the environmental measures, as per

Box 1: Terms of Reference of Safeguards Specialist – PMU

IEE.

- Liaise with the Contractors and Consultants on the implementation of the Environmental management measures proposed in the IEE
- Liaise with the various Government agencies on environmental and other regulatory matters
- Continuously interact with the NGOs and Community groups to be involved in the project
- Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project.
- Review the environmental performance of the project through an assessment of the periodic environmental monitoring reports submitted by the DSC; provide a summary of the same to the Project Director, and initiate necessary follow-up actions
- Provide support and assistance to the Government Agencies and the Asian Development Bank to supervise the implementation of the IEE during the construction as well as operation stage of the project
- Document the good practices in the project on incorporation and integration of environmental issues into engineering design and on implementing measures in the construction, and dissemination of the same

Box 2: Terms of Reference of Safeguards Specialist of DSC

- A working knowledge of India's national environmental policies and ADB SPS to reconcile parallelism and compliance between the two policy frameworks.
- Review the IEE document and ensure adequacy under ADB SPS, 2009.
- Interact on a regular basis with the sector specialists of the DSC and integrate environmentally sound practices into the detailed design of project components.
- Advise PMU/PIU for compliance with statutory clearances.
- Work out the site specific mitigation measures for components as required and integrate the same into contractual provisions.
- Develop, organise and deliver environmental training programmes and workshops for the staff of the PIU and Contractors and in accordance to the Capacity Building Programme as specified in the IEE.
- Preparation of Activity Plans as identified in IEE (these include Site Management Plans, Waste Management Plans and Disposal Plans, Occupational Safety Plans etc).
- Supervise the implementation of the Environmental provisions by the Contractors.
- Review and approve site specific environmental enhancement/mitigation designs worked out by the Contractor. Hold regular consultation meetings with the Environmental specialist of the PMU
- Review the Contractors' Environmental Implementation Plans to ensure compliance with the IEE.
- Develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE.
- Prepare and submit regular environmental monitoring and implementation progress reports.
- Assist Environmental Specialist of the PMU to prepare good practice dissemination notes based on the experience gained from site supervision.

Box 3: Terms of Reference of Safeguards Specialist (Environment) of PMC

- Support and Advice the PMU and Consultants team in-
- A working knowledge of India's national environmental policies and ADB SPS to reconcile parallelism and compliance between the two policy frameworks.
- Best Environmental Practices for responding to environmental issues involved with implementation of the projects on a sustainable basis
- Assistance and advice on institutional strengthening and capacity building at the PMU and PIU levels in regards to environmental practices.
- Ensure that baseline surveys, environmental monitoring plans and programs, initial environmental examinations (IEE) as may be required are carried out.
- Preparation of ADB procedure compliant environmental safeguard actions including impact assessment if any during the design stage

Box 3: Terms of Reference of Safeguards Specialist (Environment) of PMC
• Management plan and mitigation measures • Oversight of implementation of environmental standards and safeguards as part of project implementation • Participate in preparation of Master Plan for additional sites and contribute to the environmental safeguards to the plan and sub components • Preparation of performance monitoring reports

113. **Responsibility for updating IEE during detailed design.** DSC will update this IEE during detailed design and submit to PMU for final review before submission to ADB. PMC will assist PMU and coordinate with DSC.

114. **Responsibility for monitoring.** During construction, DSC's Environmental Specialist and the designated representative engineer of the PIU will monitor the contractor's environmental performance on day to day basis while PMC expert will randomly monitor the performance for corrective measures if required. During the operation phase, monitoring will be the responsibility of the PMU/PIU.

115. **Responsibility for reporting.** PIU in coordination with DSC will submit monthly monitoring report to PMU on the basis PMU will submit to ADB semi-annual reports on implementation of the EMP and will permit ADB to field environmental review missions which will review in detail the environmental aspects of the project. Any major accidents having serious environmental consequences will be reported immediately. PMC environmental expert will help in preparing quarterly, semi-annual and annual progress reports. The sample environmental monitoring template is attached as **Appendix 8 to10**.

B. EMP Tables

116.

117. **Table** to

118. **Table** shows the potential adverse environmental impacts, proposed mitigation measures, responsible parties, and cost of implementation. This EMP will be included in the bid documents and will be further reviewed and updated during implementation

Table 12: Environmental Management Plan – Pre construction Stage

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
Consents, permits, clearances, no objection certificate (NOC), etc.	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.	Consents, permits, clearance, NOCs, etc.	PMU	EA to report to ADB in environmental monitoring report (EMR)	check CFEs, permits, clearance, prior to start of civil works	PMU
	• Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.	Records and communications	PMU	EA to report to ADB in EMR	Acknowledge upon receipt Send report as specified in CFE, permits, etc.	PMU
	• Include in detailed design drawings and documents all conditions and provisions if necessary	Detailed design documents and drawings	Contractor	PMU and PMC PIU and DSC	Upon submission by contractor	Contractor
Location impacts pertain to the proposed conservation and restoration interventions	• Most of the proposed interventions on renovation works will not have any location impacts. However, few interventions shall have location impacts like tree cutting, erosion etc. Minimizing the clearance of trees wherever practicable shall be adopted	Detailed design documents and drawings	Contractor	PMU and PMC PIU and DSC	Upon submission by contractor	Contractor
Integration of energy efficiency and energy conservation programs in design of sub-	• The detailed designs for the sub-project components shall ensure that environmental sustainability principles,	Detailed project design, documents and necessary drawings	Contractor	PMU and PMC PIU and DSC	Upon submission by contractor	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
project components	including energy efficiency, resource recycling, waste minimization etc are integrated, and designs accordingly worked out. All the electrical and mechanical equipments used in the construction works shall be energy efficient and ISO certified as per BOQ provisions					
Establish baseline environmental conditions prior to start of civil works	• Conduct documentation of location of components, areas for construction zone (camps, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates	Records	Contractor	PMU and PMC PIU and DSC	to be included in updated IEE report	PMU
Erosion control	• Apart from the archaeologists, consult a certified geologist to look into soil stability to enable contractors to employ effective soil stabilization and erosion control measures to sustain restorative measures under the subproject • Develop an erosion	Erosion control and re-vegetation plan covering construction phase	Contractor	PIU and DSC	to be included in updated IEE report	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality. • Minimize the potential for erosion by balancing cuts and fills to the extent feasible. • Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). • Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time. Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation					

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	removal. Stage construction to limit the exposed area at any one time.					
Utilities	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase. • Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Obtain from the PIU and/or DSC the list of affected utilities and operators; • If relocations are necessary, contractor will coordinate with the providers to relocate the utility. • Require contractor to specify condition of general housekeeping (storage of construction implements, stockpiles, wastes, chemicals) in order to ensure compliance with	List and maps showing utilities to be shifted Contingency plan for services disruption	- DSC to prepare preliminary list and maps of utilities to be shifted - During detailed design phase, contractor to (i) prepare list and operators of utilities to be shifted; (ii) contingency plan	PMU and PMC PIU and DSC	to be included in updated IEE report	DSC – preliminary design stage Contractor – implementation stage

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	environmental laws and provide reference for monitoring purposes.					
Social and Cultural Resources	• Consult Archaeological Survey of India (ASI) or Punjab State Archaeology Department to obtain an expert assessment of the archaeological potential of the site. • Consider alternatives if the site is found to be of medium or high risk. • Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.	Chance find protocol is attached at Appendix 11, which is already being implemented in Tranche I projects.	- PMC to consult ASI or Punjab State Archaeology Department - PMC to develop protocol for chance finds	PMU	to be included in updated IEE report	PMC
Sites for	• Will not promote	List of pre-	- DSC to	PMU	to be included in	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
construction work camps, areas for stockpile, storage and disposal	instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc. • Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). • Disposal will not be allowed near sensitive areas which will inconvenience the community. • The construction camp, storage of fuel and lubricants should be avoided at sensitive zones. The construction camp site should be finalized in consultation with DSC and PIU.	approved sites for construction work camps, areas for stockpile, storage and disposal Waste management plan	prepare list of potential sites - DSC to inspect sites proposed by contractor if not included in pre-approved sites	PIU	updated IEE report	
Sources of construction materials	• Use quarry sites and sources permitted by government. • Verify suitability of all material sources and obtain approval from	Permits issued to quarries/ sources of materials	Contractor PMC and DSC to verify sources (including permits) if	PMU PIU	Upon submission by contractor	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	PIU. • If additional quarries are required after construction has started, obtain written approval from PIU. • Submit to DSC on a monthly basis documentation of sources of materials.		additional is requested by contractor			
Access	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion. • Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner. • Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities	Traffic management plan	Contractor	PIU and DSC	to be included in updated IEE report	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	cannot be avoided during peak hours. • Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints.					
Occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project. • Include in H&S plan measures such as: (i) type of hazards in the construction site; (ii) corresponding personal	Health and safety (H&S) plan	Contractor	PMU and PMC PIU and DSC	to be included in updated IEE report	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. • Provide medical insurance coverage for workers.					
Public consultations	• Continue information dissemination, consultations, and involvement/participation of stakeholders during project implementation.	- Disclosure records - Consultations	PMU and PMC PIU and DSC Temple administrators Contractor	PMU and PMC	- During updating of IEE Report - During preparation of site- and activity-specific plans as per EMP - Prior to start of construction - During construction	PMU Contractor to allocate funds to support

Table 13: Environmental Management Plan –Construction Stage

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Impacts on water quality	• Schedule construction activities during non-monsoon season, to the maximum extent possible.	Work schedule	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Ensure drainages within the construction zones are kept free of obstructions.	Visual inspection				
	• Keep loose soil material and stockpiles out of drains and flow-lines.	Visual inspection				
	• Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.	Visual inspection				
	• Re-use/utilize, to maximum extent possible, excavated materials.	condition in waste management plan				
	• Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites).	condition in waste management plan				
	• Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.	condition in waste management plan				
	• Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.	Vehicle inspection report				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Impacts on air quality	• Conduct regular water spraying on stockpiles.	- Visual inspection - No complaints from sensitive receptors - Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during dry season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Conduct regular visual inspection in the construction zones to ensure no excessive dust emissions.	Visual inspection				
	• Maintain construction vehicles and obtain “pollution under control” certificate from PPCB.	PUC certificates				
	• Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the subproject.	CTE and CTO				
Noise and vibrations impacts	• Limit construction activities in proposed complexes and other important areas to daytime only. • Plan activities in consultation with PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.	Work schedule	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during noise-generating activities and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Minimize noise from construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing mufflers.	Report on ambient noise level monitoring within direct impact zones				
	• Avoid loud random noise from sirens, air compression, etc.	zero incidence				
	• Drivers should be trained to use vehicle horns during the emergency time to avoid	feedback from receptors within direct and direct				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	accidents.	impact zone				
	• If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the DSC: • Locate stationary construction equipment as far from nearby noise-sensitive properties, such as the schools, hospital etc, as possible. • Shut off idling equipment. • Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. • Notify nearby residents whenever extremely noisy work will be occurring.	- Complains addressed satisfactory -GRM records				
Impacts on flora and fauna	• Conduct site induction and environmental awareness. • Strictly instruct workers not to cut trees for fuel wood • Do not harm existing vegetation in the area except indicated in site plan	Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Limit activities within the work area.	Barricades along excavation works				
	• Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut. Replacement species must be approved by district Forest Department.	- Number and species approved by District Forest Department				
Impacts on	• Ensure no damage to	- Visual	Contractor in	PIU and	- daily inspection by	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
physical cultural resources	structures/properties adjacent to construction zone.	inspection - any impact should be addressed by project resettlement plan	coordination with PIU and DSC for any structures within proposed site and construction zone	DSC	contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	
	• Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/ complaints.	- no complaints received - photo documentation				
	• Implement good housekeeping. Remove wastes immediately.	- Visual inspection - No stockpiled/ stored wastes				
	• Ensure workers will not use nearby/adjacent areas as toilet facility.	- No complaints received - Sanitation facilities for use of workers				
	• Coordinate with PIU/DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc. • Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.	- Approved routes in traffic management plan				
	• Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by	Condition in chance find protocol should be implemented at site as attached in				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	experts.	Appendix 11.				
Impact due to waste generation	• Prepare and implement a waste management plan. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas. • Coordinate with PIU/DSC for beneficial uses of excavated soils or immediately dispose to designated areas. • Recover used oil and lubricants and reuse; or remove from the site. • Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (remove concrete, wood, packaging materials, empty containers, oils, lubricants, and other similar items). • Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.	Conditions as per Waste Management Plan	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
Impacts on occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety	- Visual inspection - Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required)	Contractor
	• Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced	- Visual inspection - Work schedule - Noise level monitoring in work area				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	actively.				- random inspection by PMU, PIU, PMC and/or DSC	
	• Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective equipment, and preventing injury to fellow workers.	- Records - Condition in H&S plan				
	• Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps.	- Visible first aid equipment and medical supplies - Condition in H&S plan				
	• Provide medical insurance coverage for workers.	Records				
	• Secure construction zone from unauthorized intrusion and accident risks.	- Area secured - Trenches barricaded				
	• Provide supplies of potable drinking water.	- Supply of water				
	• Provide clean eating areas where workers are not exposed to hazardous or noxious substances.	- Workers area				
	• Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.	- Records - Condition in H&S plan				
	• Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment	- Visual inspection - Condition in H&S plan				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	operating areas.					
	• Ensure moving equipment is outfitted with audible back-up alarms.	- Construction vehicles - Condition in H&S plan				
	• Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.	- Visible and understandable sign boards in construction zone - H&S plan includes appropriate signs for each hazard present				
Risk caused by Force Majeure	• All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. All necessary steps will be taken for prompt first aid treatment of all injuries that are likely to be sustained during the course of work	Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
Impacts on socio-economic activities	• Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Visible and understandable sign boards in construction zone				
	• Employ at least 50% of the labor force, or to the maximum extent, local persons within the 20km immediate area if manpower is available.	Employment records				

Table 14: Environmental Management Plan – Post- construction Stage

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Solid waste (debris, excavated soils, etc.)	• Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase. • Use removed topsoil to reclaim disturbed areas. • Re-establish the original grade and drainage pattern to the extent practicable. • Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees. • Restore access roads, staging areas, and temporary work areas. • Restore roadside vegetation, if removed • Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites. • Monitor success of re-vegetation and tree re-planting. Replace all plants determined to be	Pre-existing condition Construction zone has been restored	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- visual inspection by contractor supervisor and/or environment specialist	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	in an unhealthy condition. • Request in writing from PIU/DSC that construction zones have been restored.					
Uncontrolled tourism development can cause congestion, increased pollution, and deterioration of destinations and thereby degrade the cultural identity of the site	• Appropriate plans will be prepared in consultation with the various stake holders, which includes tourists to be monitored and to avoid uncontrolled tourism development.	Tourist Management Plan	PMU	PMU	Quarterly	PMU
Unhygienic condition due to poor maintenance of sanitation facilities and irregular solid waste collection in the project site necessitate regular maintenance of constructed amenities.	• The Fatehgarh Sahib Municipal Corporation will carry out maintenance of the toilets, and carry out the regular collection of wastes, and will also ensure that: Sanitation facilities do not result in pollution of groundwater. The transfer of waste will also ensure that no spillage occurs and all wastes that are generated will be transported to a designated solid waste treatment site	Punjab Water Supply and Sewerage Board (PWSSB) acts and rules	PMU	PMU	Quarterly	PMU

C. Summary of Site- and Activity-Specific Plans as per EMP

119. **Table** summarizes site and activity-specific plans to be prepared as per EMP tables.

Table 15: Site- and Activity-Specific Plans/Programs as per EMP

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Detailed Design Phase	Environmental monitoring program as per detailed design	Indicate sampling locations, methodology and parameters	PMC/DSC	Contractor
Detailed Design Phase	Erosion control and re-vegetation plan	Mitigate impacts due to erosion	PMC/DSC	Contractor
Detailed Design Phase	List and maps showing utilities to be shifted	Utilities shifting	PIU/DSC during preliminary stage Contractor as per detailed design	Contractor
Detailed Design Phase	Contingency plan	Mitigate impacts due to interruption of services during utilities shifting	Contractor	Contractor
Detailed Design Phase	Chance find protocol (Appendix 11)	Address archaeological or historical finds	PMU and PMC	Contractor
Detailed Design Phase	List of pre-approved sites	Location/s for work camps, areas for stockpile, storage and disposal	PIU and DSC	Contractor
Detailed Design Phase	Waste management plan	Mitigate impacts due to waste generation	Contractor	Contractor
Detailed Design Phase	Traffic management plan	Mitigate impacts due to transport of materials and pipe laying works	Contractor	Contractor
Detailed Design Phase	H&S plan	Occupational health and safety	Contractor	Contractor

D. Environmental Monitoring Program

120. Through integration of mitigation measures in project design, impacts are mostly insignificant, temporary in nature and can be properly avoided or mitigated by following proposed mitigation measures given in the EMP of this IEE report.

121. **Table** provides the indicative environmental monitoring program which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsibility. This will be updated during detailed design to ensure EMP and monitoring program is commensurate to the impacts of the subproject.

Table 16: Indicative Environmental Monitoring Program

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
1. Detailed Design Phase							
Consents, permits, clearances, no objection certificate (NOC), etc.	- Consents, permits, clearance, NOCs, etc. - Records and communications - Detailed design documents and drawings	n/a	Visual inspection	check CFEs, permits, clearance, Acknowledge upon receipt Send report as specified in CFE, permits, etc.	Obtained prior to start of civil works Conditions of consents, permits, clearance, NOCs, etc incorporated in detailed design	already covered under PMU and PIU	PMU
Establishment of baseline environmental conditions prior to start of civil works	Ambient air quality - particulate matter in sensitive receptors	Temple complex and Parking area (one location each)	Collection of air samples (continuously 24 hours)	prior to start of civil works	baseline data included in updated IEE report	10,000 per sample	PMU
	Noise levels – day time	- Temple complex (one at silence zone, one at construction site, one at road towards temple) - Parking area (one)	Use of noise meters (once)	prior to start of civil works	baseline data included in updated IEE report	4,000 per sample	PMU
Erosion control	Erosion control and re-vegetation plan covering construction phase	n/a	Checking of erosion control and re-vegetation plan	Upon finalization of detailed design	included in updated IEE report provided to contractor	already covered under PMU and PIU	Contractor
Utilities	List and maps showing utilities to be shifted Contingency plan for services disruption	n/a	Checking of list and maps showing utilities to be shifted Checking of contingency plan for services	Upon finalization of detailed design	included in updated IEE report provided to contractor	already covered under PMU/PIU and PMC/DSC	DSC – preliminary design stage Contractor – detailed design stage

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
			disruption				
Social and Cultural Resources	Chance find protocol	n/a	Checking of chance find protocol	Upon finalization of detailed design	included in updated IEE report copy and orientation provided to contractor	already covered under PMU/PIU and PMC/DSC	PMU
Sites for construction work camps, areas for stockpile, storage and disposal	List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal	sites for construction work camps, areas for stockpile, storage and disposal	Visual inspection	Upon approval of site/s	included in updated IEE report information provided to contractor		DSC
	Waste management plan	n/a	Checking of waste management plan	Upon finalization of detailed design	included in updated IEE report provided to contractor	already covered under PMU/PIU and PMC/DSC	
Sources of construction materials	Permits issued to quarries/sources of materials	n/a	Checking of permits	Upon submission by contractor	contractor's submission	already covered under PMU/PIU and PMC/DSC	PMC and DSC
Access	Traffic management plan	n/a	Checking of traffic management plan as per detailed design (alignment, routes, etc)	Prior to start of civil works	contractor's submission	contractor's cost	Contractor
Occupational health and safety	Health and safety (H&S) plan	n/a	Checking of H&S plan	Prior to start of civil works	contractor's submission	contractor's cost	Contractor
Public consultations	- Disclosure records - Consultations	- locations of affected persons - locations of stakeholders	Documentation of (minutes of consultations, date/s, location/s, issue/s raised, photographs, etc.)	- During updating of IEE Report - During preparation of site- and activity-specific plans as per EMP - Prior to start of construction - During	included in updated IEE	already covered under PMU/PIU and PMC/DSC	PMU/PMC/DSC

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
				construction			
2. Construction Phase							
Erosion hazards	Erosion control and re-vegetation plan	- Construction zone - storage areas	Visual inspection	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	- no erosion - erosion control in place - measures in erosion control and re-vegetation plan implemented	Contractor's cost	Contractor
Impacts on water quality	- Any construction related materials - visible seepage of paints, oils, silts, etc. from storage areas - complaints related to water quality	Adjacent bodies of water including drainages, canals/nallahs, etc.	Visual inspection	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU,	- no visible change in pre-construction quality of adjacent bodies of water including drainages, canals/nallahs, etc. - no disposal and/or seepage to adjacent bodies of water including drainages, canals/nallahs, etc.	Contractor's cost	Contractor

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
				PMC and/or DSC			
Impacts on air quality	- water spraying on stockpiles - excessive dust emissions - vehicles "pollution under control" certificate from Himachal Pradesh SPCB - CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the project - complaints related to air quality	- Construction zone - Sensitive receptors site/s	Visual inspection	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	- no excessive dust emissions - no complaints from sensitive receptors - Valid pollution under control certificate/s. CFE, and/or CFO	Contractor's cost	Contractor
Impacts on air quality	PM_{10}, $PM_{2.5}$	At two locations for each monuments: (I) Residential/ sensitive area (120_ from the construction site) (ii) Periphery of the project area (downwind)	As per PPCB/ CPCB guidelines	Once in a season (except monsoons) for the entire construction period	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)	Contractor
Noise and vibrations impacts	- work schedule (limit to day time only in temple complexes and other important areas) - activities with the greatest potential to generate noise (conducted during	- Construction zone - Sensitive receptors site/s - silence zone/s	Visual inspection	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual	- no complaints from sensitive receptors	Contractor's cost	Contractor

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
	periods of the day which will result in least disturbance) - vehicle silencers and noise-reducing mufflers - complaints related to noise and vibrations			inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC			
Impacts on flora and fauna	- site induction and environmental awareness - number of trees cut - number of trees replanted - survival rate of trees planted	- construction zone - sites approved by Forest Department for replanting, if any	Visual inspection	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	- all contractor's employees have undertaken site induction and environmental awareness prior to mobilization - approved trees to be cut - approved tree species for replantation	Contractor's cost	Contractor
Impacts on physical and cultural resources	- damage to structures/properties adjacent to construction zone - sign boards to inform nature and duration of construction works and contact numbers	- construction zone	Visual monitoring	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual	- no damage to structures/properties adjacent to construction zone - sign boards understandable by local people - sufficient number of	Contractor's cost	Contractor

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
	for concerns/complaints - number of workforce near the school/s and other sensitive receptor/s - housekeeping practices, wastes around construction zones - toilet facilities for workers - transportation routes and schedule - chance find procedure			inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	workforce near the school/s and other sensitive receptor/s - wastes managed according to waste management plan - clean and usable toilet facilities for workers - transportation routes and schedule followed - no complaints from sensitive receptors - chance find procedures followed, as necessary		
Impact due to waste generation	- provisions of the waste management plan - quantity of excavated soils - quantity of used oil and lubricants - excess construction materials, and solid waste (removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items)	- construction zone	Visual monitoring	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	- wastes managed according to waste management plan - no complaints from sensitive receptors	Contractor's cost	Contractor
Impacts on occupational health and safety	- IFC EHS Guidelines on Occupational Health and Safety - noise level and duration of exposure	- construction zone	- visual monitoring - checking of records	- daily visual inspection by contractor supervisor and/or	- conditions in H&S plan - all workers oriented on H&S plan - use of PPEs, etc at	Contractor's cost	Contractor

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
	- PPEs, high visibility vests, hearing protection, etc. - conduct of H&S orientation training - qualified first aider and equipped first aid stations - medical insurance coverage for workers - security in construction zone - potable drinking water supply - clean eating areas - conduct of visitor orientation - audible back-up alarms for vehicles - sign boards in the construction zone - site accident records			environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	all times - max of 80 dBA and 8 hours exposure - visible first aid equipment and medical supplies - areas secured - trenches barricaded - adequate potable drinking water - clean eating areas away from hazardous or noxious substances - visible and understandable sign boards in construction zone		
Impacts on socio-economic activities	- % of locals in labor force - complaints/ grievances	- construction zone	checking of records	- random inspection by PMU, PIU, PMC and/or DSC - during complaints/ grievance redressal	- least 50% of the labor force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available - complaints/grievance addressed as per GRM	Contractor's cost	Contractor
3. Post-construction Phase							
Solid waste (debris, excavated soils, etc.)	- disturbed areas	- construction zone	visual inspection	upon completion of civil works prior to turn over to asset owner	- backfilled any excavation and trenches - reclaimed disturbed areas. - Re-established origial grade and drainage pattern to the extent practicable. - stabilized all areas of	Contractor's cost	Contractor

Potential Impact	Parameter to be monitored	Proposed Locations	Method of Monitoring	Frequency of monitoring	Indicator of Compliance	Cost	Source of Funds
					disturbed vegetation using weed-free native shrubs, grasses, and trees - restored access roads, staging areas, and temporary work areas. - restored roadside vegetation, if removed - removed all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. - demolished buildings/structures not required for O&M. - disposed in designated disposal sites. - success of re-vegetation and tree re-planting. Replaced all plants determined to be in an unhealthy condition. - documentation from PIU/DSC that construction zones have been restored.		

E. Capacity Building

122. The Environmental Specialist of the DSC will provide the basic training required for environmental awareness followed by specific aspects of infrastructure improvement projects along with environmental implications for projects. Specific modules customized for the available skill set will be devised after assessing the capabilities of the members of the Training Programme and the requirements of the project. The entire training will cover basic principles of environmental assessment and management; mitigation plans and programmes, implementation techniques, monitoring methods and tools. The proposed training program along with the frequency of sessions is presented in **Table** below. This training program is intended for the entire destination and is not just specific to this package.

Table 17: Training Modules for Environmental Management (Common for Entire Project)

Program	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
A. Pre-Construction Stage					
Sensitization Workshop	Introduction to Environment: Basic Concept of environment Environmental Regulations and Statutory requirements as per Govt. of India and ADB	Tourism / Forest / Roads / Culture Department Officials, Project Director (PD) and Environmental Specialist (ES) of the PMU/PIU	Workshop	½ Working Day	Environmental Specialist of the PMC and DSC
B. Construction Stage					
Module 1	Roles and Responsibilities of officials / contractors / consultants towards protection of environment Implementation Arrangements	Engineers and staff of line depts. of GoP, and PMU/PIU (including the ES)	Lecture / Interactive Sessions	½ Working Day	Safeguards Specialist of the PMC and DSC
Module 2	Monitoring and Reporting System	Engineers and staff of implementing agencies and PMU/ PIU (including ES)	Lecture / Interactive Sessions	½ Working Day	Safeguards Specialist of the PMC and DSC

F. EMP Implementation Cost

123. As part of good engineering practices in the project, there have been several measures as safety, signage, dust suppression, procurement of personal protective equipment, provision of drains, etc. and the costs for which will be included in the design costs of specific subproject. Therefore, these items of costs have not been included in the IEE budget. Only those items that are not covered under budget for construction are considered in the IEE budget.

124. This is a small construction project and it is not expected to cause much significant air, water and noise pollution. The main EMP cost will arise from monitoring of environmental parameters (air, water and noise) and training. The costs of water sprinkling for dust

suppression and providing personal protective equipment's to construction workers shall be borne by contractor as part of conditions of contract. In addition, the sources of funds for Mitigation measures during construction stage including those for monitoring during the construction stage are also to be borne by the contractor. These are deemed to be included as part of the contract price amount quoted by the contractor for the works. The cost of components for monitoring during the operation stage and the capacity building costs are to be funded by the PMU. The EMP cost is given in the **Table** below.

Table 18: Indicative EMP Budget

Sl. No.	Particulars	Stages	Unit	Rate (INR)	Total number	Cost (INR)
A	***Monitoring***					
1	Air Quality in the vicinity of the Monuments	Construction	Per sample	8000	120	960,000
2	Air Quality at Construction Camp	Construction	Per sample	8000	60	480,000
3	Air Quality at Monuments	Operation	Per sample	8000	90	720,000
4	Noise Level in the vicinity of the Monuments	Construction	Per sample	4000	160	640,000
5	Noise Level at Construction Camp	Construction	Per sample	4000	80	320,000
6	Noise Levels at Monuments	Operation	Per sample	4000	120	480,000
7	Water Quality in the vicinity of the Monuments	Construction	Per sample	4000	16	64,000
8	Landscaping		LS			150,000
	Sub -Total (A)					**3,814,000**
B	***Capacity Building***					
1	Sensitization Workshop	Pre-Construction	L.S			150,000
2	Training Session I (Environmental Safeguard)	Pre-Construction	L.S			150,000
3	Training Session II (Social Safeguard)	Pre-Construction	L.S			150,000
	Sub-Total (B)					**450,000**
	Total (A+B)					**4,264,000**

IX. FINDINGS & RECOMMENDATIONS

125. The construction (renovation) work proposed for implementing the subproject does not have any adverse/ significant impact on the environmental and the subproject does not require environmental clearances from the GoI (MoEF) and GoP (SEIAA). Being a renovation work to the existing monuments, the construction work involved will be moderate and it is expected to bring a positive impact to the local people and other tourists who are travelling to the Fatehgarh Sahib. The NOC to carry out the construction works has been obtained from the Public Works Department and Department of Cultural Affairs, Archaeology and Museums, Punjab.

126. The significance of the environmental impacts will be moderate due to the construction related impacts, given that the components are located in the vicinity of agricultural field and settlements. It is to be noted that the resultant potential impacts from these proposal can be offset through provision of proven mitigation measures at the design stage itself and also by adopting good engineering practices during construction and implementation.

127. The specific management measures that are laid down in the IEE will effectively address any adverse environmental impacts that are likely to arise due to the subproject. The effective implementation of the proposed measures will be ensured through capacity building of the PMU towards environmental management, supplemented with the technical expertise of a Safeguards Specialist who is part of the PMC and DSC Consultants. Further, the environmental monitoring plans also provide adequate opportunities towards course correction to address any residual impacts during construction or operation stages

X. CONCLUSIONS

128. The IEE carried out for the subproject shows that the proposed interventions will result in net environmental benefits in terms of enhanced tourism facilities and employment generation. If there are any adverse environmental impacts, it can be addressed through proper location, planning and design of the proposed subproject; by means of exerting adequate control of construction activity and mitigation measures. The EMP provides the mitigation plan for all identified impacts and the contract clauses for the environmental provisions which will be part of the civil works contract. Further, the proposed designs have been consulted with the stakeholders and no significant issues requiring redress in terms of environmental safeguards are known to exist at present.

129. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

Annexure 1

Rapid Environmental Assessment Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	**IDIPT – Punjab:** Imperial Highway Heritage Conservation and Visitor Facility Development at Eastern Circuit
Sector Division:	**SARD (Urban Development and Water Division)**

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following areas:			
▪ Underground utilities		✓	
▪ Cultural heritage site	✓		The project area is located at different project sites of Sirhind and Fatehgarh Sahib District, and involves management and reuse of the historical structures and providing visitors facilities at the sites.
▪ Protected Area		✓	
▪ Wetland		✓	
▪ Mangrove		✓	
▪ Estuarine		✓	
▪ Buffer zone of protected area		✓	
▪ Special area for protecting biodiversity		✓	
▪ Bay		✓	
B. Potential Environmental Impacts Will the Project cause…			
▪ Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		✓	Not anticipated.
▪ Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		✓	Not anticipated.
▪ Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		✓	Not anticipated.

Screening Questions	Yes	No	Remarks
▪ Dislocation or involuntary resettlement of people?		✓	Not anticipated. Land acquisition and resettlement are not required for the subprojects. RF to guide any resettlement related issues.
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?		✓	Not anticipated.
▪ Degradation of cultural property, and loss of cultural heritage and tourism revenues?		✓	Not anticipated.
▪ Occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?		✓	Not anticipated.
▪ Water resource problems (e.g. depletion/ degradation of available water supply, deterioration for surface and ground water quality , and pollution of receiving waters?		✓	Not anticipated.
▪ Air pollution due to urban emissions?		✓	Not anticipated.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during project construction and operation?		✓	Not anticipated.
▪ road blocking and temporary flooding due to land excavation during rainy season?		✓	Not anticipated.
▪ Noise and dust from construction activities? ▪	✓		Anticipated during construction phase. However, impacts are temporary and short in duration. The EMP includes measures to mitigate impacts.
▪ Traffic disturbances due to construction material transport and wastes? ▪	✓		Anticipated during construction phase. However, impacts are temporary and short in duration. The EMP includes measures to mitigate impacts.
▪ Temporary silt runoff due to construction?		✓	Not anticipated.
▪ Hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		✓	Not anticipated.
▪ Water depletion and/or degradation?		✓	Not anticipated.
▪ Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		✓	Not anticipated.
▪ Contamination of surface and ground waters due to improper waste disposal? ▪		✓	Not anticipated.
▪ Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		✓	Not anticipated.
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Improved management systems through capacity building and institutional development will ensure reduced burden on services and infrastructure.
▪ Social conflicts if workers from other regions or countries are hired?		✓	Priority in employment will be given to local residents.

Screening Questions	Yes	No	Remarks
▪ Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	Not applicable. Construction will not involve use of explosives and chemicals. Excavations/trenching will be done manually. Chemicals will not be used during O&M.
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	Operational area will be clearly demarcated and access will be controlled. Only worker and project concerned members will be allowed to visit the operational sites.
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Improved management systems through capacity building and institutional development will ensure reduced burden on services and infrastructure.

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: IDIPT – Punjab: Imperial highway heritage conservation and visitor facility development at eastern circuit
Sector: SAUW (South Asia Urban Development and Water Division)
Sub sector:
Division/Department:

Screening Questions		Score	Remarks[9]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	Investments will not likely be affected by climate change and extreme weather events due to the siting/location of the subprojects. No investments will be sited in flood plains etc.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	not applicable
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	Works involving conservation and restoration will use local materials similar to the existing structures.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	Maintenance will not likely be affected by climate change and extreme weather events.

[9] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Performance of project outputs	Would weather/climate conditions and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Not likely to be affected by climate change and extreme weather events.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.
Result of Initial Screening (Low, Medium, High): Low
Other Comments:

Annexure 2

No Objection Certificates

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project Management and reuse plan of Aam Khas Bagh including Conservation of Boundary wall and Providing visitors facilities at arts and crafts Centre (Maulari)
(name of the project)
is executed by PHTPB of the Tourism Department (Punjab) as per the guide lines of Govt. of India and ADB loan funded projects under IDIPT at Aam Khas Bagh, Distt Fatehgarh Sahib, Punjab.
(details of land/area/ building)

Place: Chandigarh

Date: 28/8/14

Signature .....
Department /owner

Director,
Cultral Affairs Archaeology & Museums, Punjab, Chandigarh
(Official Stamp)

Counter Signed

Deputy Commissioner

(Official Stamp)

Imperial highway heritage conservation and visitor facility development at eastern circuit – Archeology Department , Punjab

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The Aam Khas Bagh Distt Fatehgarh Sahib
(details of land/area/ building)
Where the Management and reuse plan of Aam Khas Bagh including Conservation of Boundary wall and Providing Visitors facilities at arts & Craft Centre (Maulsi
(name of the project)
project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of Directorate of cultural Affairs, Archaeology and Museums and is
(Details of the owner)
under the possession of Directorate of Cultural Affair Archaeology and Museums
(Details of possessor)

2. There is NO encroachment and NO resettlement/displacement/rehabilitation of people involved in the above Proposed Project area/building/land.

3. The proposed Project is not Partially/Fully part of any other project funded under any other scheme/programme of the State/Central Govt. or any external funding.

4. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by Directorate of Cultural Affairs,
(Name of the department/organization
Archaeology and Museums, Punjab.

Place: Chandigarh
Date: 27/8/14

Signature
Department/Organisation/Owner
(Official Stamp)

Director,
Cultral Affairs Archaeology &
Museums, Punjab, Chandigarh

Counter Signed

Deputy Commissioner
(Official Stamp)

Imperial highway heritage conservation and visitor facility development at eastern circuit – Undertaking certificate from PWD, Punjab

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project Development of Community Craft retail outlets in eastern circuit including Maulsari at Aam Khas Bagh, Sirhind.
(name of the project)
is executed by PHTPB of the Tourism Department (Punjab) as per the guide lines of Govt. of India and ADB loan funded projects under IDIPT at Maulsari al Aam Khas Bagh Sirhind, Fatehgarh Sahib, Punjab.
(details of land/area/ building)

.....

Place: Chandigarh
Date: 27/8/2014

Signature .....
Department /owner
Director,
Cultral Affairs Archaeology & Museums, Punjab, Chandigarh
(Official Stamp)

Counter Signed

Deputy Commissioner

(Official Stamp)

Imperial highway heritage conservation and visitor facility development at eastern circuit – NOC for Community Craft retail outlet , Archeology Department , Punjab

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The Maulsari at Aam Khas Bagh, Sirhind Fatehgarh Sahib (details of land/area/ building) Where the Development of Community Craft retail outlets in eastern Circuit (name of the project) including Maulsari at Aam Khas Bagh Sirhind project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of Directorate of Cultural Affairs, Archaeology and Museums, Punjab and is (Details of the owner) under the possession of Directorate of Cultural Affairs, Archaeology and Museums Punjab (Details of possessor)

2. There is NO encroachment and NO resettlement/displacement/rehabilitation of people involved in the above Proposed Project area/building/land.

3. The proposed Project is not Partially/Fully part of any other project funded under any other scheme/programme of the State/Central Govt. or any external funding.

4. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by Directorate of Cultural Affairs, Archaeology and Museums Punjab (Name of the department/organization)

Place: Chandigarh
Date: 27/8/14

Signature .....
Department/Organisation/Owner
(Official Stamp) Director, Cultral Affairs Archaeology & Museums, Punjab, Chandigarh

Counter Signed

Deputy Commissioner
(Official Stamp)

Imperial highway heritage conservation and visitor facility development at eastern circuit – Undertaking Certificate for Community Craft retail outlet , Archeology Department , Punjab

Annexure 3

Sample Outline of Spoil Management Plan (SMP)

1.0 Purpose and application:

SMP is to describe how the project will manage the spoil generated and reuse related to design and construction works. This is an integral part of EMP. The objective of SMP is to reuse of spoil from works in accordance with the spoil management hierarchy outlined in this document.

2.0 Objectives of SMP:

The objectives of SMP are:

- To minimize spoil generation where possible
- Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- Mange onsite spoil handling to minimize environmental impacts on resident and other receivers
- Minimize any further site contamination of land, water, soil
- Manage the transportation of spoil with consideration of traffic impacts and transport related emissions

3.0 Structure of SMP:

Section 1: Introduction of SMP
Section 2: Legal and other requirements
Section 3: Roles and responsibilities
Section 4: Identification and assessment of spoil aspects and impacts
Section 5: Spoil volumes, characteristics and minimization
Section 6: Spoil reuses opportunities, identification and assessment
Section 7: On site spoil management approach
Section 8: Spoil transportation methodology
Section 9: Monitoring, Reporting, Review, and Improvements

4.0 Aspects and Potential Impacts

The key aspects of potential impacts in relation to SMP are listed in table below

Aspects	Potential Impacts
Air Quality	Potential for high winds generating airborne dust from the stock piles
Sedimentation	Potential for sediment laden site runoff from spoil stockpiles and potential for spillage of spoil from truck on roads
Surface and Groundwater	Contamination of water (surface and ground water)
Noise	Associated with spoil handling and haulage and storage
Traffic	Impacts associated with spoil haulage
Land Use	Potential for spoil to be transported to a receivable site that doesn't have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize spoil generation
Sustainability	Limited sites for storage, reuse opportunities

5.0 Spoil volumes, characteristics and minimization

5.1 Spoil volume calculations: Estimate the volumes of spoils produced from each of the construction sites.

5.2 Characterization of spoil: Based on the type of spoil; characterization is done (sand stone, mud mix materials, reusable materials

5.3 Adopt Spoil Reduce, Reuse Opportunities

- An overview of the assessment methodology to be used is mentioned below.
- Consideration of likely spoil characteristics
- Identification of possible reuse sites
- Screening of possible reuse opportunities

5.4 Identification of possible safe disposal sites for spoil: Those spoils which can't be reuse shall be properly disposed in designated areas, such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as spoil disposal area. The local administration must be consulted and if required permission should be obtained from them.

5.5 Storage and stock piling

5.6 Transportation and haulage route

6.0 Based on the above, the contractor will prepare a SMP as an integral part of EMP and submit it to the PIU/DSC for their review and approval.

Annexure 4

Sample Traffic Management Plan (TMP)

A. Principles

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties
- Avoid hazards in
- addressing issues that may delay the project.

B. Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

C. Analyze the impact due to street closure, if required

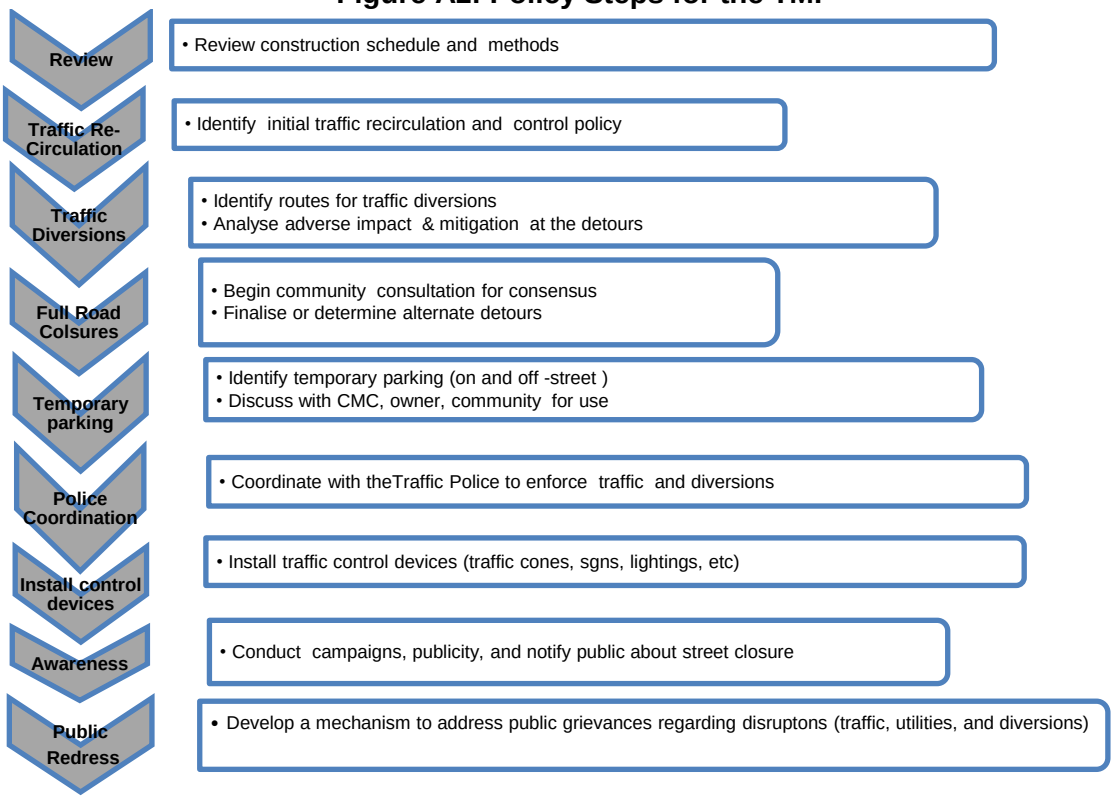
3. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the PIU, local administration to use the local streets as detours;
- consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;

- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

4. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the Detour Street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A1: Policy Steps for the TMP



D. Public awareness and notifications

5. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

6. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their

travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) Traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) Defensive driving behaviour along the work zones; and
(iii) Reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

E. Vehicle Maintenance and Safety

10. A vehicle maintenance and safety program shall be implemented by the construction contractor. The contractor should ensure that all the vehicles are in proper running condition and it comply with roadworthy and meet certification standards of GoN. All vehicles to be used at STWSSP shall be in perfect condition meeting pollution standards of GoN. The vehicle operator requires a pre state of shift checklist. Additional safety precautions will include the requirement for:

- Driver will follow the special code of conduct and road safety rules of Government of Nepal.
- Drivers to ensure that all loads are covered and secured drivers to ensure operation equipment can’t leak materials hauled
- Vehicles will be cleaned and maintained in designed places.

F. Install traffic control devices at the work zones and traffic diversion routes

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

11. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

12. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

13. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

14 In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

15. The PIU and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

Annexure 5

Public Consultations

Public Consultations shall be done during detailed design phase and included in final IEE report

S.No.	Place	Date	Participants	Issues discussed
1.	Chandigarh	December 2013	Officials of Tourism Department and other stakeholders	Finalization of project components, environment and social safeguard requirements
2.	Fatehgarh Sahib	December 2013	Officials of forest department, tourism department and Pollution control board	Proposed design elements, clearance requirements, environment and social policies of ADB.
3.	Chandigarh	December 2013	Officials of PWD	Proposed design element, NOC/ clearance requirements, environment and social policies of ADB.
4.	Chandigarh	December 2013	Officials of Tourism Department/ Fatehgarh Sahib Municipal Corporation	Role of Environmental and Social safeguard and the necessity of IEE in the project implementation and methodology adopted

1. **SITE:** Imperial highway heritage conservation and visitor facility development at eastern circuit

2. **Date**: Meetings conducted on 13th December 2013 at PMU office and during site visits at Fatehgarh Sahib for the development of two subproject components *(i) Conservation/ Revitalization of Aam Khas Bagh, Interpretation Centres, Visitor Amenities, Conservation of Historic landscape and (ii) Tourist Development of Mughal Route (Badshahi Sarak) through Conservation, Visitors Amenities, Tomb of Raffudin, Tomb of Alfsani, Tomb of Bibi Taj and Rauza Sharif*.

Objective: The consultation exercise is being undertaken to access the acceptance of our proposed scope of work by the stakeholders at site Village Panchayat members/ Patwari/ villagers/ tourists at site/ head of mosque PMU officials. The outcome of this consultation would enable us to modify and finalize the SCR and help us in the preparation of the relevant documents for SAR/DDR/DPR and other round of consultations during the various phases of Project implementation. This is a continual exercise and is taken up at different stages of the project. Public consultation will be conducted also at the detailed design phase and will be updated in the IEE.

Procedure: An informal FGD/Individual interviews and formal official meetings conducted with various stakeholders at that site and line agency departments.

Mosque trust Members: Various members /Village head (Patwari)/ Head prophet of mosque are all in favor of the project. This land is free from any encumbrances and they are ready to provide the NOC and give their full support in the implementation of the project.

Vendors/Visitors The conservation works at all the heritage sites and allied facilities will be provided in a systematic manner would facilitate the visitors and ease the traffic influx to the sites. There are no shops and vendors around the site, as confirmed through site visits.

Major Problems: Tourists especially women who are coming from other states and Pakistan (who have religious beliefs in these monuments and pay annual visits as family rituals) are

disappointed with the indifferent behaviour of the villagers towards these monuments. Further, tourists/ school children/ local community groups are not able to appreciate the historical significance of these monuments on the route of imperial highway due to poor interpretation/ informative facilities/ signages.

Recommendations from the stakeholders: All Stakeholders/ including villagers, caretakers/ Village head (Patwari) have provided recommendations for project components and the same will be incorporated to design the SARs and DPR documents of the project. Tourists/ women groups/ School children have recommended better interpretative/ signages on the sites to appreciate the historical significance and conservation work, as this will promote Rural tourism in the long run. Local community/ village Panchayat members have expressed their desire for training in livelihood generation trainings including Rural Tourism & Bed and breakfast schemes.

	
Consultation with line agency departments	*Consultation with members of village Panchayat at site*

Annexure 6

Sample Grievance Redress Form
(To be available in Local Language and English)

The _____Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback. Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date		**Place of registration**			
Contact Information/Personal Details					
Name		**Gender**	* Male * Female	**Age**	
Home Address					
Place					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of Official registering grievance)	
Mode of communication: Note/Letter E-mail Verbal/Telephonic	
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	Yes No
Means of Disclosure:	

Annexure 7

Sample Semi-Annual Environmental Monitoring Report Template

This template must be included as an Appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

INTRODUCTION

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be Reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual Report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
- What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;

- If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
- adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Are their designated areas for concrete works, and refuelling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/EMP

No.	Sub-Project Name	EMP/CEMP Part of Contract Documents (Y/N)	CEMP/EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed & Additional Measures Required

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Brief description on the approach and methodology used for environmental monitoring of each sub-project
-

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L	TN (mg/L)	TP (mg/L)

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L	TN (mg/L)	TP (mg/L)

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

Annexes

- **Photos**
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection Report
- Other

Annexure 8

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION:_____GROUP:_____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION:_____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory_____ Incident_____ Resolved _____Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

Signature
_____

_____ _____
Name **Position**

Annexure 9

ARCHAEOLOGICAL MONITORING AND CHANCE ENCOUNTER PROTOCOL

Protocol for Design and Supervision Consultants (DSC) RECORDING WHEN HISTORIC FEATURES ARE REVEALED DURING EXCAVATIONS IN ARCHEOLOGICALLY SIGNIFICANT BUILDINGS AND STRUCTURES.

PREPARED BY CULTURAL HERITAGE CONSERVATION SPECIALIST (CHCS) INTL. PMC, THOMAS ADDYMAN (SIMPSON AND BROWN ARCHITECTS, EDINBURG.

1.1 Introduction

When historic features such as walls, brick constructions and other features are encountered during excavation the excavation must be stopped immediately and the DSC must be informed immediately.

1.2 Cleaning

When a feature is discovered it must be defined by careful cleaning. Roots must be removed and dirt must be carefully cleaned away and brickwork revealed and carefully scraped clean. The section or trench base should also be cleaned back for a little distance around the feature.

1.3 Record photography

When the feature is clean good photography should be taken – vertical and face-on shots and a few general shots of the feature, also showing its position in relation to surrounding features, buildings, etc. The red and white photographic scale should be in each photograph. The scale should be parallel to the top and bottom of each camera shot. The photographic scale should be kept in the store room in the northern bastion on site when not in use [ADD EXAMPLE PHOTOS].

When test excavations / investigations are made at the fort (to examine historic floor levels, etc) these should also be recorded photographically. The photographic scale should be used.

The photographed should be catalogued (date, location, direction of shot)

1.4 Drawn record

When features are revealed a drawn record should also be made.

a. General location record – measuring its position and orientation within the fort / in relation to surrounding structures
b. Record drawings – detail drawings made in plan and section/profile. The extent (edges) of the feature should be drawn and the level of the existing ground surface and the top and base of the feature should be recorded. These levels should be marked on the drawings. The drawings should include detail of the construction of the feature. Perspective sketches could also be made if necessary. Explanatory notes can also be put on the drawings.

1.5 Reporting finds

When finds are made these should be reported to PMC (for the attention of Tom Addyman). Photographs and record drawings should be sent.

1.6 Discovery of historic objects

When clearance and excavation takes place artefacts and historic objects are sometimes found. These should be recovered and kept in a safe place. The place of discovery should be recorded and each find given a number and tag tied to the find with the same number on it. A list of the finds should be kept (with the find No. And place of discovery and date of discovery recorded). Tom Addyman will inspect the finds in the store when he does site inspections to decide which are important and should be kept.

1.7 Contractors' instruction: mechanical excavation of services trenches at Gobindgarh Fort

Contractors working at Gobindgarh Fort must take additional care not to destroy or damage historic features during excavations. There are many buried historic features inside the fort – wells, ancient drains, remains of buildings, other walls, grain pits, etc. Every care must be made not to destroy these during excavations.

Excavator drivers need to be instructed to be aware of hitting buried features and that they must be investigated before continuing work.

When features are encountered during mechanical excavation work should stop and the DSC must be informed immediately so that they can be inspected at the first opportunity.