Draft Initial Environmental Examination

October 2014

IND: Infrastructure Development Investment Program for Tourism, Tranche 3- Punjab Patiala Tourism Destination Development Projects

Prepared by Government of Punjab for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 16 October 2014)

Currency unit	–	India Rupee/s (Re/Rs)
Rs1.00	=	$0.162
$1.00	=	Rs61.585

ABBREVIATIONS

ADB –	Asian Development Bank
BPL –	Below Poverty Line
CPCB –	Central Pollution Control Board
DSC –	Design and Supervision Consultants
DoT –	Department of Tourism
EA-	Executing Agency
EAC –	Expert Appraisal Committee
EARF –	Environmental Assessment Review Framework
EIA –	Environmental Impact Assessment
EMP –	Environmental Management Plan
GoI –	Government of India
GoP-	Government of Punjab
PHTPB-	Punjab Heritage and Tourism Promotion Board
PPCB –	Punjab Pollution Control Board
IDIPT –	Infrastructure Development Investment Program for Tourism
IEE –	Initial environmental examination
MC –	Municipal Corporation
MINARS -	Monitoring of Indian National Aquatic Resources Series
MLD –	Million Litres per day
MOEF –	Ministry of Environment and Forests
MSL –	Mean Sea Level
NGO –	Non-Governmental Organization
O&M –	Operations and Management
PIU –	Project Implementation Unit
PMC-	Project Management Consultants
PMU –	Project Management Unit
PWD –	Public Works Department
REA –	Rapid Environmental Assessment
SEAC –	State Expert Appraisal Committee
SPM –	Suspended Particulate Matter
SPS –	Safeguards Policy Statement
TCP –	Town and Country Planning
TMP-	Traffic Management Plan
TDS –	Total Dissolved Solids
TSS –	Total Suspended Solids

NOTES

(i) The fiscal year (FY) of the Government of India ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 March 2008

(ii) In this report, "$" refers to US dollars unless otherwise stated

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EXECUTIVE SUMMARY

1. **Background**. The Infrastructure Development Investment Program for Tourism Financing Facility (the Facility) 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.

(i) **Subproject Components**. On successful completion of most of the Tranche – 1 projects funded by the ADB, the Department of Tourism, Punjab has extended its tourism development in other districts of Punjab under Tranche – 2 program. In view of this, various infrastructure subprojects which can support the tourism development has been selected across the state for implementation. One such Sub Project (Pkg. No. PB/ IDIPT/ T3/06/05 & PB/ IDIPT/ T3/06/06 to be advertised by Q4/ 2014 and Q3/ 2016 respectively) is the "Patiala Tourism Destination Development Projects". It is proposed to be developed under five subproject components i. Development of Heritage Route around the city including improvement of façade and parking facilities for Eco - Cabs at different locations; ii. Development of Environmental park including parking facility for tourist at Sheesh Mahal; iii. Nabha Fort Conservation and Adaptive Reuse as community resource centre; iv. Conservation of Main Gate of Qila Androon, and Art Conservation works with Adaptive Reuse, Landscaping and utility works at Qila Mubarak; v. Conservation and adaptive reuse of Mohindra Kothi. Under this project various historical and cultural monuments are identified and proposed for development/ improvement in Nabha and Patiala. The project aims to highlight the culture of Patiala city and educate visitors about the historical structures and the values of city, to showcase the historical importance of Maharaja's era of posterity, to enhance tourist attractions by upgrading site environment and infrastructure facilities and services and also to develop models of partnership between state- local community and tourism industry. The present condition of the monuments are deteriorated / badly damaged. To conserve these monuments the subproject with following interventions are proposed:

(ii) Conserving the original built fabric by following original material and techniques of construction for historical structures

(iii) Provision of boundary wall.

(iv) Provision of the entrance gate and guard rooms for security purpose.

(v) Adaptive reuse of structure and provision of Interpretation center and Craft Centre

(vi) Provision of Tourist Reception Centre.

(vii) Landscaping and Site Development

2. **Executing and implementing agencies.** The executing agency is the Punjab Heritage and Tourism Promotion Board (PHTPB), Punjab. 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. The implementing agency is Project Implementation Unit (PIU) which is set up at Rupnagar that would be

supported by Design Supervision Consultant (DSC). PWD, Punjab is the asset owners for this subproject.

3. **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.

4. **Description of the Environment**. The Subproject area is located in the Patiala District; this district is located in the eastern part of the Punjab state and it lies between 29°49' 30°40' North latitudes and 75° 58' 76° 48' East longitudes. Total geographical area of the district is 3720 sq.km. The Patiala district is divided into five sub-divisions (tehsils[1]) namely Patiala, Nabha, Ghanaur, Rajpura and Samana comprising of eight-community development blocks viz. Patiala, Nabha, Sanaur, Bhunerheri, Rajpura, Ghanaur, Samana and Patran for the purpose of administration. The district headquarter, Patiala town falls in Patiala Tehsil.

5. **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.

6. 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.

7. **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

8. **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

[1] A *tehsil* or *tahsil/tahasil* also known as *Taluka* (or *taluq/taluk*) or *mandal*, is an administrative division of India and some historical states of South Asia.

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.

9. 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.

10. 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.

11. **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.

12. **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.

13. **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. The Infrastructure Development Investment Program for Tourism Financing Facility (the Facility) 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. The proposed subproject is part of Eastern Circuit[2]. The project aims to enhance the participation of the local communities and the private sector in tourism. It will enhance tourist access and participation in Patiala. 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).

3. The subproject includes the following components:

(i) Development of Heritage Route around the city including improvement of façade and parking facilities for Eco - Cabs at different locations;
(ii) Development of Environmental park including parking facility for tourist at Sheesh Mahal;
(iii) Nabha Fort Conservation and Adaptive Reuse as community resource centre.
(iv) Conservation of Main Gate of Qila Androon, and Art Conservation works with Adaptive Reuse, Landscaping and utility works at Qila Mubarak.
(v) Conservation and adaptive reuse of Mohindra Kothi.

4. All the sub project components are described with all the location/ significant details below:

(i) Development of Heritage Route around the city including improvement of façade and parking facilities for Eco - Cabs at different locations.

- The proposed Patiala Heritage Trail runs from the two main entry points to the town, the railway station and bus stand. It follows the city's main boulevard the Mall Road passing a range of historic and architecturally appealing buildings, most set in attractive gardens.
- The Eco-cab is a public transport system operated by private agencies in Patiala town. The provision of parking spaces for Eco-cabs has been proposed for promotion of environmental friendly mode of transport and to encourage private entrepreneurship and systematize their operations and facilitation of visitors parking facilities at designated places en-route heritage sites. Purchase of Eco-cab however is not part of the sub-

[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.

project. Training will be provided to the drivers of Eco cab drivers along with the training as a tour guide.

(ii) The Mohindra Kothi is proposed as a new Patiala Welcome Visitor Centre.

- The visitor centre will tell the Patiala Story, feature the world class medal collection, and provide craft workshops, retail outlets and Tourist Information Centre.
- The visitor trail passes along the Mall Road ,National Institute of Sports in the Old Moti Bagh Palace to the Sheesh Mahal and Moti Bagh Bir.
- From the Sheesh Mahal, it heads north to the walled city passing a number of attractions along the heritage walk route such as Shahi Samadhian before reaching the Qila Mubarak and Qila Androon.
- From the Qilas it passes through the vibrant bazaars before returning to the Mall Road. The objective of the Heritage Trail is to highlight the many "must see" attractions.

5. **Development of Environmental Park including parking facility for tourist at Sheesh Mahal.** Sheesh Mahal is a famous tourist place in Patiala city which was built by Maharaja Narinder Singh in 1847. It is situated behind the Moti Bagh Palace in Old Moti Bagh area. The Mahal was residential palace of Maharajas of Patiala. It is designed on the pattern of Shalimar garden of Lahore with terraces, fountains, channels and flower beds. The Mahal contains a large number of frescoes, most of which were made under Maharaja Narinder Singh. To give the artistic look on the walls and ceilings of the Sheesh Mahal, Maharaja Narinder Singh engaged artistic painters from Rajasthan and Kangra. The artist made the floral designs on the walls and ceilings. Their art depict the vision of Bihari, Surdas and Keshav in the poetic form and in varied colors.

Figure 1: Map showing old Moti Bagh Palace and the Sheesh Mahal area and Quila Mubarak

6. **Nabha Fort Conservation and Adaptive Reuse as community resource centre:** Nabha Fort complex is located in the centre of Nabha town with the complex facing north-west.

The open space towards the front is ceremonial by design, the entrance to both the Quila Androon and the Kacheri (now Tehsil) being from this space. The south eastern edge of the complex has adequate open ground behind it to provide a grand view of the rear of the Quila complex (the outer fortification wall on that edge having collapsed many years ago). The Bastions and the existing fort wall define the edge of the cultural edifice. The fort is flanked by residential buildings on its three edges and a commercial spine on the north-western edge. The built grain size suggests that most of the north western and north-eastern edge have retained the historic fabric size, whereas the plot sizes on the south-eastern and south-western edge have larger plot sizes which might be evidence of a change in historic fabric texture.

Figure 2: The map showing the Nabha Fort in the Nabha region.

7. The foreground of the Quila Androon (towards the main entrance) is scattered with small- sized temporary built components which are later additions. The project aims conservation and preservation of the building layers from all distinct historic periods including its revitalization as a vibrant and socially meaningful cultural hub.

8. Conservation of Main Gate of Qila Androon and Art Conservation works with Adaptive Reuse, Landscaping and utility works at Qila Mubarak. Qila Mubarak (Fort of triumph) was established by Baba Ala Singh, The founder of the Patiala dynasty in 1763CE. Qila Mubarak is an outstanding and exemplary architectural delight located in Patiala. The fort has elements of both Mughal and Rajasthani architecture, the imposing facade of Qila Androon is marked by monumentality with the facade slightly leaning inwards. The sprawling Qila Mubarak complex is spread on a 10-acre land in the heart of Patiala. The complex comprises a main palace building known as Qila Androon, the guesthouse called Ran Bass as well as a Darbar Hall. The red sandstone gateway with latticed multiple arched opening is the only entrance to the Fort complex and leads to an open space popularly known as the Qila Androon Chowk. The Fort is laid out on a square plan, with monumental bastions at the corners. The fort wall is plain with some elaborative stucco work still surviving.

Figure 3: The Quila Mubarak Site map

9. Gate of Qila Androon. Qila Androon is located within the Qila Mubarak complex comprising multiple courtyard typologies with each courtyard and structure known by name of a palace. The Rang Mahal is the largest courtyard in Qila Androon complex located along the central axis accessed through a door near the main entrance to Qila Androon. Sheesh Mahal is a G+2 structure located in the central portion of Qila Androon built around a central courtyard with multiple terraces overlooking the same. The Androon gate to Qila Androon gives a grand gesture to the complex with beautiful stucco work on its exterior facade. The arched openings at the gate lead to the Androon courtyard. The gate faces the main gate and is flanked by the Darbar Hall and Ranbas.

10. Conservation and Adaptive Reuse of Mohindra Kothi. The Mohindra Kothi site is situated along the Mall Road Patiala, which directly connects to National Highway 64 and is close to the Patiala Train Station (at the junction of Mall Road and NH 64). The Mohindra Kothi Complex is bounded by the Mall Road on the northwest, a service road on the northeast and another road lined by shops on the southeast. It shares its southwest boundary with the Phul Cinema, an early 20th century building designed in the Art Deco style with an Indian flavour. It is a historical building with extensive grounds surrounding it. It currently houses the Rajiv Gandhi National University of law. This university is however proposed to be relocated to another site, which will make complex available for development as a tourist centre in the heart of Patiala.

B. Purpose of the IEE

11. In accordance with ADB's Safeguard Policy Statement (SPS, 2009), this IEE assesses the environmental impacts that are likely to arise due to the proposed project (PB/ IDIPT/ T3/06/ 05 & 06 to be advertised by Q4/ 2014 and Q3/ 2016 respectively) and also specifies the measures towards addressing these impacts. The IEE is based on a careful review of SAR, concept notes, subproject site plans, field visits and secondary data to characterize the environment and identify potential impacts; and interviews and meaningful consultations with primary and secondary stakeholders.

12. Based on the collected information, the project categorization for the subprojects has been performed (refer **Table 1**). The subprojects components have been categorized as "B" due to the environmental impacts that are envisaged; hence these subprojects require detailed IEE/EMP studies. The IEE shall cover all the construction and operation related environmental impacts. Since the subproject is at the concept stage, the environmental assessment is

performed in a broader approach. During the detailed design, the prepared IEE shall be further updated as stand-alone IEEs and EMPs for each of the procurement packages (and appended to the Contract document) (PB/ IDIPT/ T3/06/ 05 & 06 to be advertised by Q4/ 2014 and Q3/ 2016 respectively). This will enable integration of environmental provisions /management measures in the Contract Document. The IEE goes further and provides sample contract clauses (**Appendix 1**) that needs to be added to contract documents.

Table 1: Subproject Categorization

Sl. No.	Subproject Components	Project Categorization[3]	Remarks
1.	Development of Heritage Route around the city including improvement of façade and parking facilities for Eco - Cabs at different locations.	**B**	• Facade improvements of buildings along the existing heritage route of 2.5 km. This includes facade improvement of Shahi Samadhan, Haveliwala Mohalla, Chhatta Nanumal, and Darshini Deori. • Provision of parking facilities for the existing Eco-cabs at the identified 26 locations in city. • Landscaping and site development: o Developing the route with state of art street furniture and colonial lamp posts. o Solid waste management which includes provision of bins on the streets of Heritage route. o Providing interpretative signages (uniform designs) approximately 30, and illumination facilities to attract tourists. o Provision of explanatory plaque at its entrance, providing a detailed description of the place and its historical significance with a common "Patiala Heritage route branding". o The proposed route is primarily used by Eco-cabs and other light vehicles (two-wheelers). o Capacity building for tourism development and management.
2.	**Development of Environmental park including parking facility for tourist at Sheesh Mahal**	**B**	• Development of Environment Park at total land of 4 Acres. • Improvement of existing boundary wall and gate and other facilities. The Sheesh Mahal currently has a side entrance to the building which provides a side view of the building. The entrance to the complex is proposed to a closed entrance with driveway on the Banasar Ghar area. • Provision of interpretation facilities at Banasar Bagh and adding provisions for adaptive reuse of Banasar Bagh as exhibition space. A restaurant and gift shop can also be housed in this building which can be leased to a private operator. • Site Development o Provision of parking space at an area of 125x50m towards south east of Banasar Ghar for tourist coaches and private vehicles. o Provision of internal signages (uniform designs) for every building, exhibit and artifact. o Capacity building for tourism development and management.
3.	**Nabha Fort Conservation and Adaptive Reuse as community resource**	**B**	• Conservation and restoration of Qila Androon, Kacheri, external wall and gates, library building. • Scientific investigations: Scientific investigations will be carried out to identify the original levels, original

[3] as per Safeguard Policy Statement (SPS), 2009

Sl. No.	Subproject Components	Project Categorization[3]	Remarks
	centre		masonry and details of the historic site. • Site clearance and removal of additions and alterations/Adaptive Reuse of heritage buildings: Development of craft outlet, community resource centre for training and education, interpretation centre. Development of craft outlets will involve community in large and provide livelihood/employment opportunity to the local population. Nabha Foundation[4] is an active philanthropic organization working with Government of Punjab in state specifically in the Nabha region for community development activities and therefore the revitalization of the complex will be a significant vibrant asset for the community and the people of Nabha. • Conservation Management Plans for fort will be prepared along with the DPR. • Interpretation of the historic of Nabha particularly the contribution of Maharaja Hira Singh and Ripudaman Singh in the Darbar Hall. • Site Development o Visitor Amenities such as provision of toilets, cafeteria and parking o The complex lies in the heart of the city, illumination of the monument will enhance the presence of the monument and its visibility from far. • Capacity building for tourism development and management.
4.	**Conservation of Main Gate of Qila Androon, and Art Conservation works with Adaptive Reuse, Landscaping and utility works at Qila Mubarak.**	**B**	• Conservation and restoration of buildings at Qila Mubarak for the structures not undertaken for conservation in past by GoI. • Conservation works to be done to architectural and decorative details such as intricate mural paintings and mural paintings and mirror work in the Sheesh Mahal and Rang Mahal. • Adaptive reuse of area between Qila Androon and outer wall for museum and to showcase Ruler lifestyles. • Landscaping and Site Development: o Landscaping and site development of the inner areas of Qila Mubarak o Provision of adequate lighting and internal signages. o Provision of visitor facilities and services at appropriate places. • Rerouting the electric cables currently running across the fort, in more sensitive manner to avoid damages to the structure. • Capacity building for tourism development and management.
5.	**Conservation and Adaptive Reuse of Mohindra Kothi**	**B**	• Conservation and restoration of the Mohindra Kothi. • Adaptive reuse of Mohindra Kothi as a Tourist Information centre. The TIC will entail comprehensive

[4] The Nabha Foundation, A non government organisation has been working in Nabha and its extended rural areas in the area of community development training the local community in practices of sustainable development, health and cultural industries. The target communities are women and youth.

Sl. No.	Subproject Components	Project Categorization[3]	Remarks
			material about historical, architectural and cultural significance of Patiala and Punjab state. • Mohindra Kothi will also house the medal gallery which is reputed to be the largest medal collection in the world. • Adaptive reuse of Kothi into craft centre. The south eastern portion of Kothi has a courtyard which is proposed for developing and showcasing the Patiala crafts. • The ancillary buildings within Mohindra Kothi can be converted to restaurant specializing in Punjabi cuisine, a budgeted hotel which can be leased on PPP mode. • Landscaping and Site Development o Adequate landscaping in form of hardscape and softscape. o Provision of internal signages and lighting system of uniform design. • Integration of services such as electrical and plumbing. • Capacity building for tourism development and management.

A. Report Structure

17. This report contains ten sections including this introductory section: (i) Introduction, (ii) Description of Project Components, (iii) Policy, Legal and Administrative Framework, (iv) Description of Environment (v) Screening of Potential Environmental Impacts and Mitigation Measures, (vi) Information Disclosure, Consultation and Participation, (vii) Grievance Redresses Mechanism, (viii) Environmental Management Plan, (ix) Findings & Recommendations and (x) Conclusions

I. DESCRIPTION OF PROJECT COMPONENTS

18. This section briefs the proposed subproject components/ intervention with appropriate maps/locations for ready reference

(i) Development of Heritage Route around the city including improvement of façade and parking facilities for Eco - Cabs at different locations;

19. The city represents royal heritage and rich culture with magnificent Forts, Palaces, and extensive gardens like Quilla Androon, Sheesh Mahal, Moti Bagh Palace, Baradari Garden, Art Galleries and National Institute of Sports. Baradari Gardens, Gurudwara Dukhniwaran Sahib, Temple Kali Devi, which on account of the rare murals on its walls has been declared a National Monument. The city offers wide variety of tourist attractions and experiences tourist flow throughout the year.

20. Large number of tourists within the country and outside country visits the city. The Heritage Walk is intended to make people aware of the architectural heritage and living culture of the old town of Patiala and also pointing out places of heritage importance, intricate designed havelis and the town houses. The total length of proposed heritage

walk is 2.5 km.

There is no physical delineation; however, pedestrian safety will be a priority. The proposed route is primarily used by eco-cab and other light vehicles (two-wheelers), except for some small stretches and intersections .Adequate measures will be worked out and incorporated in the DPR . Further the tour conductors / guides accompanying the visitors will also be trained to ensure visitor safety.

i. Qila Mubarak is the main landmark of the ancient city centre of Patiala. The entire old town within 11 old city gates is itself an important tourist attraction.
ii. Old Moti Bagh Palace comprises extensive 130 ha of grounds including an 18 hole golf ground. The Palace was used in mid 19th century by Maharaja Narinder Singh as place of entertainment which is now occupied by National Sports Institute.
iii. Sheesh Mahal complex is located behind the Old Moti Bagh Palace between the Palace and Moti Bagh Bir, the old hunting forest of the Maharaja. It is currently an Art Gallery and Museum, exhibiting fascinating and unique comprehensive Medal collection and fine collection of miniature paintings. The historic Old Polo Ground is converted into a sports centre.
iv. Mohindra Kothi originally was guest house for Maharaja and a unique Heritage Building. The Mohindra Kothi Complex is bounded by the Mall Road on the north west, a service road on the north east and another road lined by shops on the southeast.

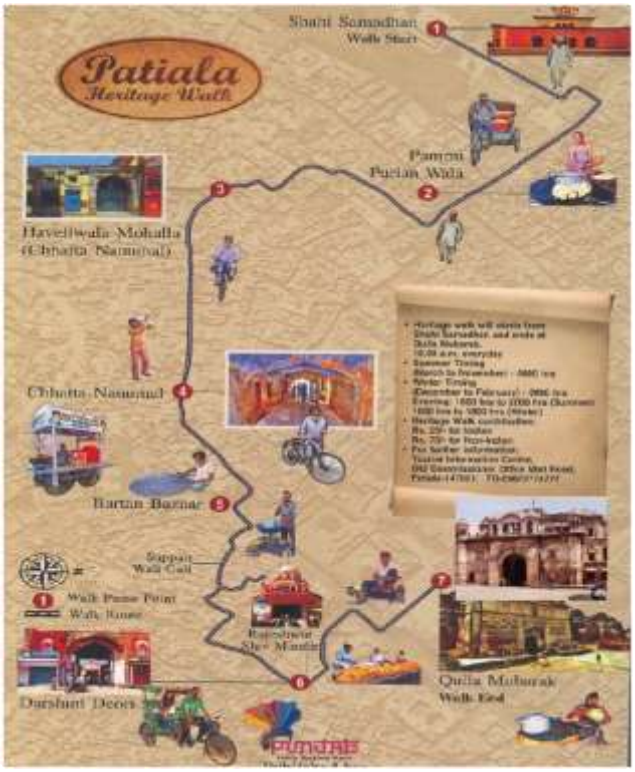


Figure : Identified Route of the “Patiala Heritage Walk”

a. Development of Environmental park including parking facility for tourist at Sheesh Mahal

Sheesh Mahal was built by Maharaja Narinder Singh in 1847. It is situated behind Moti Bagh Palace in Old Moti Bagh area and is one of the famous tourist places in Patiala city. The design and the decoration of the palace was chosen by Maharaja Narinder

Singh. One section of Sheesh Mahal is decorated with colored glass and mirror work and it is also known as ‘Palace of Mirrors’.

Figure 1: Sheesh Mahal, Patiala

The Mahal was residential palace of Maharajas of Patiala. It is designed on the pattern of Shalimar garden of Lahore with terraces, fountains, channels and flowerbeds. The Mahal contains a large number of frescoes, most of which were made under Maharaja Narinder Singh. Sheesh Mahal houses museum and art gallery depicting paintings of Jaya Deva’s poetry and Geet Govinda. To give the artistic look on the walls and ceilings of the Sheesh Mahal, Maharaja Narinder Singh engaged artistic painters from Rajasthan and Kangra. The artist made the floral designs on the walls and ceilings. A parking area is needed to serve the Sheesh Mahal and the land in this subproject is the only land available in the vicinity of it. Parking has been proposed at an area of 125x50m towards south east of Banasar Ghar for tourist coaches and private vehicles which is largely empty, with few trees. Loss of trees, if any, will be compensated as per the applicable regulations.

In the foreground of the Sheesh Mahal is a huge tank with two towers on both sides. A suspended bridge popularly known as the Lakshman Jhula connects the palace with the Banasar Ghar which houses the Natural History Gallery.

b. Nabha Fort Conservation and Adaptive Reuse as community resource centre

The project area constitutes the historic Quila complex at Nabha in Patiala district. The geographical coordinate of the fort complex is 30.37474 N, 76.152109 E. The Quila complex is spread over an area of 47,660 sq m. While the Quila Androon within the complex covers an area of 11,706 sq m. It is almost square in plan with approximately 100 m side.

Figure 2: Nabha Fort

c. Conservation of Main Gate of Qila Androon, and Art Conservation works with Adaptive Reuse, Landscaping and utility works at Qila Mubarak.

The Qila Mubarak complex is almost square in plan with central part occupied by Qila Androon, encircled with a wide passage line with other ancillary buildings and Fort wall all around. Both the Qila and Qila gates are entered through single imposing gateways. The building and courts in Qila Mubarak displays a wide range of decorative elements but the most striking include:

- Stuccowork and Lime Plaster: Lime stucco work can be seen on external walls and internal walls are covered in a line chunan plaster.
- Painted decorative ceilings: Painted ceilings form an important part of many rooms of Qila Mubarak.
- Carved wooden doors and windows: Rooms on the third floor right above the central bay has glass and timber panel for its arched openings.
- Marble Pavilions: finely crafted marble pavilions flank the main entrance gate.
- Metal-wood works for the balcony: On the exterior facade of the main gate has a semi-open balcony on its second floor that showcases an excellent artistry in metal and wood work above its arch openings.

Figure 3: Qila Mubarak, Patiala

Gate of Qila Androon

Qila Androon which is part of Qila Mubarak is located in the heart of old part of Patiala city. It is accessed through an impressive gateway containing the palace with room accessed through various courtyards and spread across different levels. The Androon gate to Qila gate gives a grand gesture to the complex with the beautiful stucco work on its exterior facade. The arched opening at the gate leads to the Androon courtyard. The gate faces the Main gate and is flanked by the Durbar Hall and Ranbas. The architectural style of QIla Androon including its gateways is blend of Rajput and Mughal style architecture. The Androon gate is more protected within the site than the outer gate as this is within the complex of the Qila Mubarak. On entering the main gate there is an open plaza with Ran Bas on its left and Darbar Hall to the right accessed by a wide flight of stairs, facing the Androon gate. The gate guards the Sheesh Mahal, Rang Mahal and Burg Baba Ala Singh forming the entrance to the Qila Androon. The structure has issues such as water penetration and deterioration of architectural renders. The structure comprises load bearing wall made of Nanakshahi bricks and lime plaster, wall surface is finished with decorative stucco work and paint. The ceilings comprise a combination of wooden rafters supporting brick slabs and Jack arch roof with steel girders finished in plaster and paint.

d. Conservation and Adaptive Reuse of Mohindra Kothi

The Mohindra Kothi site is a heritage structure of the erstwhile Patiala state. It is located along the Mall Road Patiala. The Mohindra Kothi Complex is presently under Rajiv Gandhi University of Law. The complex connects to National Highway 64 and is close to the Patiala railway station (at the junction of Mall Road and NH 64).

It is bounded by the Mall Road on the northwest, a service road on the northeast and another road lined by shops on the southeast. It shares its southwest boundary with the

Phul Cinema, an early 20th century building designed in the Art Deco style with an Indian flavor.

Figure 4: Mohindra Kothi , Patiala

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

v. 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.

vi. **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.

vii. **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.

viii. **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

ix. 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.

x. The environmental rules and regulations applicable for the subproject are listed in the **Table 2**. 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 2: Environmental Regulatory Compliance

Subproject Components	Applicability of Acts/Guidelines	Compliance Criteria

[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
a. Development of Heritage Route around the city including improvement of façade and parking facilities for Eco - Cabs at different locations. **b. Development of Environmental park including parking facility for tourist at Sheesh Mahal.** **c. Nabha Fort Conservation and Adaptive Reuse as community resource centre.** **d. Conservation of Main Gate of Qila Androon, and Art Conservation works with Adaptive Reuse, Landscaping and utility works at Qila Mubarak.** **e. Conservation and Adaptive Reuse of Mohindra Kothi**	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 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. All required NoCs and undertakings have been obtained and enclosed as Annexure The local archeological department suggestion on the same shall be considered during the project designing/ planning stages.

Source: MoEF, CPCB and ADB

xi. The **Table 2** 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.

xii. 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.

III. DESCRIPTION OF ENVIRONMENT

A. Environmental and Social Profile

xiii. The Subproject area is located in the Patiala District; this district is located in the eastern part of the Punjab state and it lies between 29°49' 30°40' North latitudes and 75° 58' 76° 48' East longitudes. Total geographical area of the district is 3720 sq.km. The Patiala district is divided into five sub-divisions (tehsils) namely Patiala, Nabha, Ghanaur, Rajpura and Samana comprising of eight-community development blocks viz. Patiala, Nabha, Sanaur, Bhunerheri, Rajpura, Ghanaur, Samana and Patran for the purpose of administration. The district headquarter, Patiala town falls in Patiala Tehsil.

1. The physiography of the district forms a part of the Indo- Gangetic plain and consists of three types of region :

- The Upland Plain: This terrain covers about 80 percent of the total area of the Patiala district. Leaving aside a small choe-infested tract in the north-east and a narrow belt running along river Ghaggar in the east, south-east and south, the whole of the district is covered by this unit. It is higher in elevation than the flood plain but is lower than the choe-infested plain. In general, its land surface is smooth.
- The Choe-infested Foothill Plain: The western upland plain occupies the whole of Nabha and Samana Tehsil and north-western and western parts of Patiala Tehsil. This part of the upland plain is superimposed by sand dunes at various places. These mounds of sand, popularly known as tibas, are found in belts.
- The Floodplain of the Ghaggar River: This terrain unit occupies nearly 4 per cent of the area of Patiala District. It covers eastern most part of Rajpura Tehsil. Its elevation ranges between 290 and 320 meters. A number of seasonal streams, locally known as choe traverses through this unit, which is its special feature. They originate in the Shiwalik Hills and after traversing through this region, it joins either the Ghaggar River or any of its tributaries.

2. Apart from this, the district has a complex drainage system consisting of canals and rivers. The River Ghaggar is the most important water channel of the district. It is essentially a seasonal stream, which remains dry during most part of the year. However, during the rainy session, it remains in spate often flooding the adjoining villages, causing damage to crops, livestock and at times to houses and human lives. A number of

subsidiary rivulets join the Ghaggar River, the most important ones being the Tangri Nadi, Patiala-Wali Nadi, Sirhind Choe and the Jhambowali Choe. Apart from the natural drainage line, the district also has three important canals viz.,Bhakra Main Line canal, the Nawana Branch, and the Ghaghar Link.

1. Climate and Rainfall

3. The climate of Patiala can be classified as subtropical with hot summer and cold winter except during monsoon season when moist air of oceanic origin reaches the area. There are four seasons in a year. The hot weather season starts from mid - March to last week of the June (Mean Maximum temperature of the city is 43.1°C (May and June) and the mean Minimum is 2.1°C (January) followed by the southwest monsoon, which lasts up to September. The transition period from September to November forms the post monsoon season. The winter season starts late in November and remains up to first week of March. The highest relative humidity touches 80% during July – August whereas the lowest relative humidity values of 26% are recorded during April-May. Wind velocity is maximum at 8.4 km/hr during May while it is minimum at 3.2 km/hour during September.

4. The normal monsoon and annual rainfall of the Patiala district is 547 mm and 677 mm, respectively which is unevenly distributed over a period of 29 days. The southwest monsoon sets in from last week of June and withdraws in end of September, which contributes to about 81% of annual rainfall. July and August are the wettest months. The remaining 19% rainfall is received during non-monsoon period.

2. Geology and Soil

5. The soil is deep alluvium varying from clay to silty loam. The soil is mostly heavy in texture but is light where the sand content becomes high. The soil material forms part of Indo-Gangetic plains deposited by River Ghaggar and its tributaries from the Shiwaliks and outer Himalaya. Due to arid climate, the soils are light coloured. Tropical arid brown soils exist in the major parts of the Patiala district. Here soils are deficient in nitrogen, phosphorus and potassium. In Patran and Samana blocks, soils are arid brown.

6. Geological formation consists of clay, sand, silt and gravel belt. The depth of clay varies and at places it goes down to 30 feet. At places there are large patches of 'Kallar', which have been caused mostly by impeded drainage. Kankar pans are also found in some areas. The soil in most of the area is very hard due to compaction of clay caused by trampling by grazing over the years. The penetration and percolation of the water is extremely slow in such areas. Occasional flooding of the streams during rains causes erosion of soil.

3. Surface Water Quality

7. The Subproject 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 Subproject district. The surface water sample has been collected from the canal, which traverses through the Patiala District.

Table 3: 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

Sl.no	Parameters	Canal at Sirhind – Patiala Road (28+200km)	CPCB Norms for Surface Waters
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

8. 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.

4. Groundwater Quality

9. Groundwater samples across the Patiala 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 ground water of the district is alkaline in nature. The EC in the area ranges from 687 to 4100 Micro mhos /cm. Nitrate values ranges between 0.40 to 200 mg/l and fluoride concentration ranges from 0.20 to 2.8 mg/l. At few places high fluoride and nitrate concentrations have been observed. The range of physicochemical concentration is given in the Table 4. The shallow ground water is of $NaHCO_3$ type and mixed faeces type of water also occurs wherever EC increases is observed within the district.

Table 4: Surface Water Quality

Sl.no	Parameters	Units	Minimum limit	Maximum limit
1.	pH		7.1	8.24
2.	EC Micro mhos /cm at 25°C		687	4100
3.	Alkalinity	mg/l	195	810
4.	CO_3	mg/l		
5.	HCO_3	mg/l	238	988
6.	Cl	mg/l	21	379
7.	SO_4	mg/l	37	1260
8.	NO_3	mg/l	0.4	200
9.	F	mg/l	0.44	2.8
10.	Ca	mg/l	12	130
11.	Mg	mg/l	1.2	81
12.	Na	mg/l	116	778
13.	K	mg/l	1.4	205
14.	B	mg/l	0.14	0.54

15.	TH as $CaCO_3$	mg/l	35	657
16.	As	mg/l	0.0002	0.0022
17.	Fe	mg/l	0.1	0.75
18.	SAR		3	14.01
19.	RSC		7.37	12.17

Source: CGWB, District Brochure

10. Groundwater is potable and fit for drinking and domestic purposes, except at few places, where high values of nitrates and fluoride is observed. The suitability of ground water for irrigation purpose is calculated by SAR and RSC values, which ranges between 3.00-14.01 and –7.37-12.17 respectively. The ground water in the area is C_3 and C_4 type from salinity point of view and S_1 and S_2 type from solidity point of view; as such ground water is fit for irrigation.

5. Ambient Noise Quality

11. 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 Patiala district. Hence, the information given in the EIA report has been utilized to discuss the air quality of the Subproject area.

Table 5: 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

12. It is observed from the analysis that the key noxious air pollutants like Sulphur di-Oxide (SO_2) and Oxides of Nitrogen (NO_x) 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.

6. Ambient Noise Quality

13. The information on the noise quality for the district is 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 Patiala district for discussion. The noise quality information is depicted in the **Table 6**.

Table 6: 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

14. 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.

7. Agriculture

15. Out of geographical area of 3,72,000 hectares in Patiala district, 3,03,000 hectares (81%) is cultivable. 93% of the area is irrigated through tube wells and 3% by canals. The crop density of the district is 97%. There are 62,090 agricultural families in the district. Wheat, barley, paddy, maize and sugarcane are major crops of the district. To break the wheat-paddy cycle, contract-farming has been started in the district by the Agriculture Department and PAFC for the crops like basmati, maize, pulses, barley etc. Agriculture is the main and most important economic activity in the district.

8. Ecological Resources

20. The important fauna and flora found in the site are given in the following table:

Table 7: Flora and Fauna of Patiala

Important Fauna		Important Flora	
Common name	**Zoological Name**	**Common name**	**Botanical Name**
Black buck	*Antilope cervicapra*	Amb	*Mangifera indica*
Blue bull	*Boselaphus tragocamelus*	Bamboo	*Bambusa vulgaris*
Chital	*Axis axis*	Beri	*Zizyphus mauritiana*
Hare	*Lepus nigricollis*	Drek	*Melia azadirachta*
Hog deer	*Axis porcinus*	Eucalyptus	*Eucalyptus globolus*
Jackal	*Canis aurius*	Imli	*Tamarindus indica*
Jungle cat	*Felis chaus*	Jamun	*Syzygium cumini*
Rhesus monkey	*Macaca mulatta*	Karir	*Capparis aphylla*
Spotted owlet	*Athene brama*	Karonda	*Carissa karanda*
Wild boar	*Sus scrofa*	Khajoor	*Phoenix sylvestris*
Black partridge	*Melanoperdix niger*	Kikar	*Acacia Nilotica*
Brahminy myna	*Sturnia pagodarum*	Lasura	*Cordia myxa*
Common quail	*Coturnix coturnix*	Mesquite	*Prosopis juliflora*
Grey partridge	*Perdix perdix*	Neem	*Azadirachata indica*
Peafowl	*Pavo cristatus*	Shisham	*Dalbergia sissoo*
Rose Ringed Parakeet	*Psittacula krameri*	Teak	*Tectona grandis*

Source: Forest Department, Punjab

A. Social Profile

9. Population Distribution

16. 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 Patiala District is 18.96 lakh in 2011 which was 16.34 lakh in 2001. However, the district population growth shows a down trend in Average Annual Growth Rate (AAGR) of

nearly 1.5 percent. As per the census 2011, the total number of HH in the district is 372293. The Average Household (HH) size has been reduced from 5.6 (census 2001) to 5.1 (census 2011).

10. Urban and Rural Population

17. The urban population in Punjab during 2001 was 33.9% which has increased to 37.5% in 2011. The urban population in Patiala District is 36.4% as per 2001 census which is increased to 40.3% in 2011 census. The

18. Table **8** below presents the Population distribution of the State and the Patiala District.

Table 8: Population Distribution – Patiala District

Population Distribution	2001		2011	
	Punjab	**Patiala**	**Punjab**	**Patiala**
Area (Sq.km)	50362	3325	50362	3325
Avg. HH size	5.6	5.6	5.0	5.1
Tot Population	24358999	1633879	27743338	1895686
AAGR 1991-2001-2011	1.8	1.7	1.3	1.5
Tot Urban Pop	8262511	594631	10399146	763280
Tot Rural Pop	16096488	1039248	17344192	1132406
% of Urban Population	33.9	36.4	37.5	40.3

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

11. Population Density

19. Population Density of Punjab is 551 per sq.km in 2011. Density of Patiala is 570 per sq.km in 2011, which is higher than the value of 2001 census (491 Sq.km).

12. Sex Ratio

20. As per census 2011, the sex ratio of the state was 895 females per 1000 males. Whereas it was 874 females per 1000 males in 2001. In the Patiala District it was 891 females per 1000 males, which is higher than the 2001 figures (875 females per 1000 males).

13. Literacy Rate

21. The average literacy rate for the Patiala 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 (69.3%).

14. Work participation Rate

22. As per census 2011, the Workforce Participation Rate in the Patiala district is 35 percent, which is almost similar to the Punjab state average of 36 percent. Patiala District Workforce Participation was 37 percent in 2001 which is now decreased to 35 percent.

15. Social Characteristics

There is no ST population in the Punjab state. The percentage of the SC in the Punjab state is 32% and the Patiala district constitutes to 25% (as per census 2011).The Table 9 below presents the Demographic status of the Punjab state and the Patiala district.

Table 9: Social Characteristic – Patiala District

Social component	2001		2011	
	Punjab	Patiala	Punjab	Patiala
Population Density	484	491	551	570
Sex Ratio	874	875	895	891
Literacy Rate	69.7	69.3	75.8	75.3
Workforce Rate (WPR)	37	37	36	35
% of SC	29	23	32	25

Source: Compiled from Primary Census Abstract, 2001& 2011

IV. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

xiv. The assessment for environmental impacts due to the implementation of this subproject has been carried out for the potential impacts envisaged during the various stages of the project planning and implementation:

(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.

xv. **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). Presently, there is no resettlement issue involved in the project as all the NoCs and undertakings have been obtained from the asset owners and line agency department as given in the table below. 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.

Table 10: Status of NoCs and undertakings obtained for the sub projects – Patiala District

S.No.	Sub-Project Component	Asset Owner	NOC / Undertaking	Date of Issue
1.	MC Patiala (Rajindra Lake and construction of Rickshaw at Patiala)	Deputy Commissioner, Patiala	NOC & Undertaking	03.12.13

2.	Sheesh Mahal at Patiala	Divisional Forest Officer	NOC	27.09.14
3.	Project Development of Environmental Park including parking facility at Sheesh Mahal Patiala	Forest Range Officer, Patiala	NOC	27.09.14
4.	Project Development of Environmental Park including parking facility at Sheesh Mahal Patiala	Forest Range Officer, Patiala	Undertaking	27.09.14
5.	Development of Heritage route including facade improvement and parking facility at Shahi Smadhan Patiala	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	NOC	26.09.14
6.	Development of Heritage route including facade improvement and parking facility at Shahi Smadhan Patiala	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	Undertaking	26.09.14
7.	Development of Qila Mubarak, Patiala	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	NOC	27.08.14
8.	Development of Qila Mubarak, Patiala	Director, Central Affairs Archaeology & Museum, Punjab, Chandigarh	Undertaking	27.08.14
9.	Construction of Rickshaw Stand, at various location at Patiala	Deputy Commissioner Patiala	Undertaking	21.11.13
10.	Construction of Rickshaw Stand, at various location at Patiala	Deputy Commissioner Patiala	NOC	21.11.13

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

- Incorporation of adequate drainage provisions
- Adoption of design compatible with the natural environment and suitable selection of materials to enhance the aesthetic appeal and blend with the natural surroundings.
- Straight lines and simple geometry in the proposed landscape and architectural features.
- Use of subtle colours and simple ornamentation in the structures.
- Natural tree species in the proposed landscape.
- Use of local stone in the proposed walkways and built structures thus maintaining a rustic architectural character

xvii. 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

xviii. **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.

xix. The proposed sub project interventions are conservation/ renovation works; hence anticipated location impacts are very minimal. However, most of the project sites are within the city, hence transportation of the construction materials to the project site (monuments) may have impact on the adjoining areas. During the project construction, activities related with transport of construction materials will be carried out during the night hours/ or holidays to ensure smooth traffic and least impact on the adjoining neighborhood areas. Hence, it is advised/ suggested to carry out the renovation works during the summer and winter seasons. The construction camps have to be located within the project sites to minimise further location impacts. However, the anticipated impacts on the area of influence will be mainly localized, short in duration and expected only during construction period.

B. Pre-construction Impacts and Mitigation Measures

xx. **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:
  a) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase.
  b) Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
  c) Require contractor to obtain from the PIU and/or DSC the list of affected utilities and operators;
  d) If relocations are necessary, contractor along with PIU/DSC will coordinate with the providers/line agencies to relocate the utility.

xxi. **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

xxii. **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.

xxiii. **Sources of construction materials.** Moderate amounts of gravel, sand, and cement will be required for this subproject. Extraction of materials will not disrupt any natural land contours and vegetation, as the project sites are not surrounded by any natural sites. 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.

xxiv. 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.

xxv. **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:

- 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

xxvi. **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

xxvii. **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.

xxviii. **Summary of pre-construction** activities is presented in 11. 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 11: 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.

Parameters	Mitigation Measures
	• 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.
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	• 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.
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.

Parameters	Mitigation Measures
	• 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. • Provide free access to households and businesses/shops along ROWs during the construction phase.

C. Anticipated Construction Impacts and Mitigation Measures

xxix. 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.

xxx. **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.

xxxi. **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

xxxii. **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.

xxxiii. **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.

xxxiv. **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.

xxxv. **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.

xxxvi. **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.

xxxvii. **Impact due to Waste Generation**. Construction activities will produce excavated soils, construction materials, and solid wastes (such as removed concrete, wood, trees and

[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.

plants, packaging materials, empty containers, oils, lubricants, and other similar items). These 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.

xxxviii. **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.

xxxix. **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.

xl. **Summary of Mitigation Measures during Construction**. **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 12: 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

[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
	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 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 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

Potential Impact	Mitigation Measures
	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.

xli. 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

xlii. 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

xliii. Impacts on environmental conditions associated with the O&M of the subproject Sub Project Sub Project (Pkg. No. PB/ IDIPT/ T3/06/05 & PB/ IDIPT/ T3/06/06 to be advertised by Q4/ 2014 and Q3/ 2016 respectively) 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.

V. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. ADB Disclosure Policy

xliv. 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.

xlv. 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

xlvi. 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 Patiala. These consultation's (**Table** below) provides the necessary inputs for identifying the required needs of the communities, and the relevant stakeholders.

Table 13: Stakeholder's Consultation

S.No.	Place	Date	Number of participants	Participants	Issues discussed
1.	Patiala	March 2014		Officials of Forest Department	Implementation of the proposed components under the Tranch-2 and its issues and management strategies.
2.	Patiala	April 2014		Officials of Forest Department	Discussion on the construction materials that are to be used at the site and its alternatives to reduce impacts. Obtaining NoC, Proposed design elements, Tree felling permission from the Forest Department
3.	Chandigarh	December 2013		Officials of PWD Department	NOC/ clearance requirements, environment and social policies of ADB.
4.	Chandigarh	December 2013		Officials of Tourism Department / Forest Department	Role of Environmental and Social safeguard and the necessity of IEE in the project implementation and methodology adopted

C. Plan for Continued Public Participation

xlvii. 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.

xlviii. 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, Patiala 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 Patiala, 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.

xlix. 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.

VI. GRIEVANCE REDRESS MECHANISM

l. 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.

li. 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

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

liii. **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.

liv. **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).

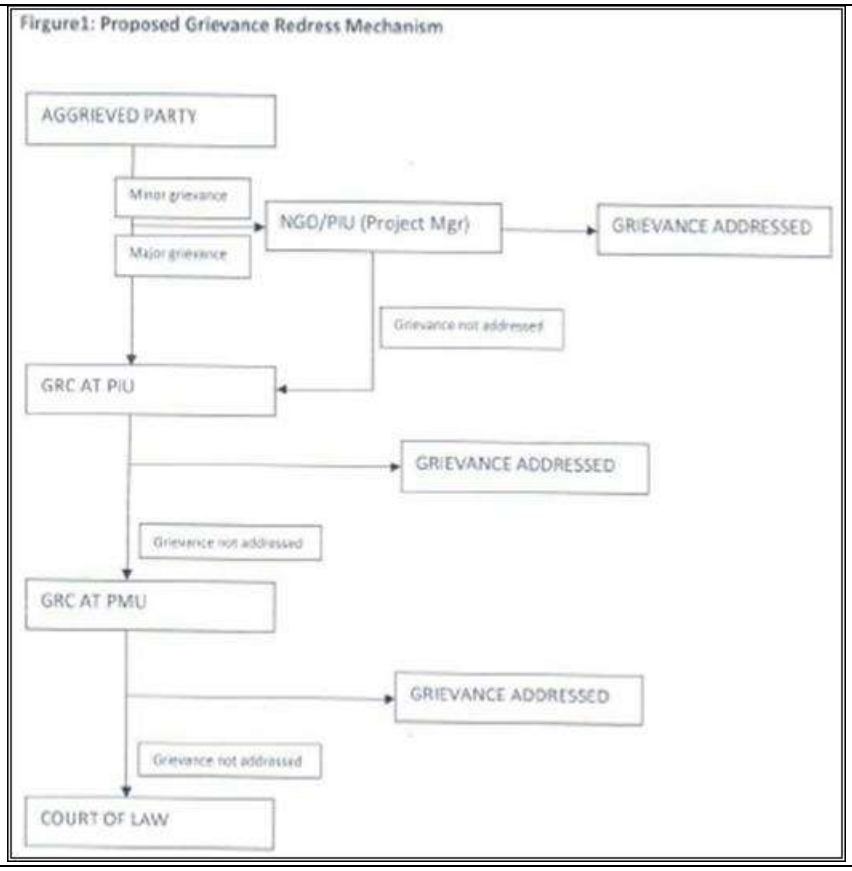


Figure 5: Grievance Redress Mechanism in IDIPT, Punjab

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)

lv. **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.

VII. ENVIRONMENTAL MANAGEMENT PLAN

lvi. 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.

lvii. 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.

lviii. 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

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

- PMU is the Executing Agency (EA) responsible for overall management, coordination, and execution of all activities funded under the loan. Project Implementing Unit (PIU) is the Implementing Agency (IA) responsible for coordinating procurement and construction of the project.
- The Project Management Consultant (PMC) assists PMU in managing the project including procurement and assures technical quality of design and construction;
- The Design and Supervision Consultant (DSC) will prepare the DPR of the project and will carry out construction supervision during project implementation. Their responsibility will also include EMP implementation supervision;
- Project Implementation Unit (PIU) will be established in Rupnagar. This PIU will look into progress and coordination of day to day construction works with the assistance of DSC; and
- 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

environmental related mitigation measures will also be implemented by the contractor.

lx. 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

- 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 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

- 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).

Box 2: Terms of Reference of Safeguards Specialist of DSC
• 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- • 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 • 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

lxi. **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.

lxii. **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.

lxiii. **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

lxiv. Table1 to **lxv.**

lxvi. **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

Table14: 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-project components	• The detailed designs for the sub-project components shall ensure that environmental sustainability principles, 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	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
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
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.	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
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	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

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.					
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 sensitive zones. The construction camp site should be finalized in consultation with DSC and PIU.	List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal Waste management plan	- DSC to prepare list of potential sites - DSC to inspect sites proposed by contractor if not included in pre-approved sites	PMU PIU	to be included in updated IEE report	Contractor
Sources of construction materials	• Use quarry sites and sources permitted by government. • Verify suitability of all material sources and obtain approval from 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.	Permits issued to quarries/ sources of materials	Contractor PMC and DSC to verify sources (including permits) if additional is requested by contractor	PMU PIU	Upon submission by contractor	Contractor
Access	• Plan transportation routes so that	Traffic	Contractor	PIU and DSC	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
	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.	management plan			updated IEE report	
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.	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
	• Include in H&S plan measures such as: (i) type of hazards in the construction site; (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 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 15: 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	Vehicle inspection report				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	any leaks before the vehicle resumes operation.					
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	Contractor
	• Minimize noise from	Report on				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing mufflers.	ambient noise level monitoring within direct impact zones			by PMU, PIU, PMC and/or DSC	
	• 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 accidents.	feedback from receptors within direct and direct 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.	- Complaints addressed satisfactory - GRM records				
Impacts on	• Conduct site induction	Records	Contractor	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
flora and fauna	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			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	
	• 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 physical cultural resources	• Ensure no damage to structures/properties adjacent to construction zone.	- Visual inspection - any impact should be addressed by project resettlement plan	Contractor in coordination with PIU and DSC for any structures within proposed site and construction zone	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
	• 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/				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
		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 experts.	Condition in chance find protocol should be implemented at site as attached in 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.	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	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	• 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.				required) - random inspection by PMU, PIU, PMC and/or DSC	
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) - random inspection by PMU, PIU, PMC and/or DSC	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 actively.	- Visual inspection - Work schedule - Noise level monitoring in work area				
	• Provide H&S orientation training to all new workers to ensure that they are apprised of	- Records - 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
	the rules of work at the site, personal protective equipment, 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.	- 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	- 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
	equipment 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				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	• 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 16: 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 in an unhealthy condition. • Request in writing from PIU/DSC that construction zones have been restored.	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
Uncontrolled tourism development	• Appropriate plans will be prepared in consultation with the various stake holders, which	Tourist Management Plan	PMU	PMU	Quarterly	PMU

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
can cause congestion, increased pollution, and deterioration of destinations and thereby degrade the cultural identity of the site	includes tourists to be monitored and to avoid uncontrolled tourism development.					
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 Patiala 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

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

Table 17: 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

lxviii. 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.

lxix. **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 18: Indicative Environmental Monitoring Program

Sl No	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Standard / Guidelines	Responsibility
1	Air Quality in the vicinity of the Monuments	Construction Stage	SO_2, NO_2, 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)	Once in a season (except monsoons) for the entire construction period	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
2	Air Quality at Construction Camp	Construction Stage	SO_2, NO_2, PM_{10}, $PM_{2.5}$	At construction camp, samples shall be collected during construction	Once in a season (except monsoons) for the entire construction period	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
3	Noise Level in the vicinity of the Monuments	Construction Stage	Equivalent Day & Night Time Noise Levels	At two locations for each monuments (similar to air quality locations)	Once in a season during construction stage	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
4	Noise level at Construction Camp	Construction Stage	Free field at 10 m from the equipment whose noise levels are to be determined.	At construction camp, samples shall be collected during construction	Once in a season during construction stage	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
5	Water quality	Construction stage	TDS, TSS, pH, Hardness	At two locations in the vicinity of the subproject area	Twice a year (pre monsoon and post monsoon) for the entire period of construction	IS: 2296	Contractor (Through approved Environmental Monitoring Agency)
6	Air Quality in the vicinity of the Monuments	Operation Stage	SO_2, NO_2, PM_{10}, $PM_{2.5}$	One location for each monuments: (I) Residential/ sensitive area (120° from the construction site) (ii) Periphery of the project area (downwind)	Once in a season (except monsoons) for the first 3 years of operation	As per PPCB/ CPCB guidelines	PMU & PIU (Through approved Environmental Monitoring Agency)
7	Noise Levels in the vicinity of the Monuments	Operation Stage	Equivalent Day & Night Time Noise Levels	One location for each monuments (similar to air quality locations)	Once in a season for the first 3 years of operation	As per PPCB/ CPCB guidelines	PMU & PIU (Through approved Environmental Monitoring Agency)
8	Landscaping Monitoring	Operation Stage	Survival rate of planted trees/ shrubs	Locations where landscaping has been suggested	Thrice in a season for the first 3 years of	State Horticulture	PMU & PIU (Through Department of

Sl No	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Standard / Guidelines	Responsibility
					operation	standards	Horticulture)

E. Capacity Building

lxx. 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 19: 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

lxxi. 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.

lxxii. 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 20: 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**

VIII. FINDINGS & RECOMMENDATIONS

lxxiii. 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 Patiala. 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.

lxxiv. 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.

lxxv. 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

IX. CONCLUSIONS

lxxvi. 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.

lxxvii. 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).

Appendix 1: EMP Contract Clauses

1.0 GENERAL

1.1 The Contractor shall be responsible for implementation of environmental provisions outlined in the Environment Mitigation Plan (EMP) for Sub Project (Pkg. No. PB/ IDIPT/ T3/06/05 & PB/ IDIPT/ T3/06/06 to be advertised by Q4/ 2014 and Q3/ 2016 respectively), in addition to adhering to all environmental provisions in the applicable specifications for the works will be adhered to as part of good engineering practices.

1.2 All works undertaken towards protection of environmental resources as part of the EMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out and no separate payment will be made unless otherwise specified explicitly. The costs towards environmental management as per EMP unless otherwise provided as a separate head, will be deemed to be part of the BoQ of the project. The scope of works of the contractor towards the implementation of the environmental provisions shall be as follows:

- Abide by all existing environmental regulations and requirements of the Government of India, during implementation,
- Compliance with all mitigation measures and monitoring requirements set out in the Environmental Management Plan (EMP)
- Submission of a method statement detailing how the subproject EMP will be complied with. This shall include methods and schedule of monitoring.
- Monitoring of project environmental performance and periodic submission of monitoring reports.
- Compliance with all measures required for construction activities in sensitive areas, including Protected areas (natural tourism assets) and heritage monuments, in line with the regulatory requirements of these Protected / Heritage areas, and the guidelines set forth in the management plans for these areas, including the necessary archaeological surveys prior to commencement of works, obtaining clearances/permits to excavate & construct in protected areas around ASI sites.
- Compliance of all safety rules at work, and Provision of adequate health and safety measures such as water, food, sanitation, personal protective equipment, workers insurance, and medical facilities.

1.3 The detailed provisions for specific environmental issues are outlined in the EMP table. Key clauses are outlined in the following sections.

2.0 QUARRY AND BORROWING

2.1 The Contractor will identify and seek prior approval of the Engineer for quarrying and borrowing operations. Quarry and borrowing will be carried only from locations approved by the Engineer. Quarrying, if required in the project will be only from approved quarries and no new quarries will be opened for the purpose of the project. Any deviation from the provisions will be immediately notified and approval of the engineer is to be sought.

2.2 The Contractor shall maintain all borrow sites, stockpiles, and spoil disposal areas so as to assure the stability and safety of the works and that any adjacent feature is not endangered, and to assure free and efficient natural and artificial drainage, and to prevent erosion. Stockpiling of materials (topsoil, fill material, gravel, aggregates, and other construction materials) shall not be allowed during rainy season unless covered by a suitable material. Storage on private property will be allowed if written permission is obtained from the owner or authorized lessee.

2.3 Borrow areas and quarries shall be sited, worked, and restored in accordance with the specifications. Spoils shall be disposed of at approved disposal sites prepared, filled, and restored in accordance with the related specification requirements.

2.4 Following excavation for the works, the Contractor shall take all steps necessary to complete drainage and slope protection works in advance of each mining season. Erosion or instability or sediment deposition arising from operations not in accordance with specifications shall be made good immediately by the Contractor at the Contractor's expense. The Contractor shall take all steps necessary to complete drainage in advance of each rainy season in the areas excavated for borrow materials.

2.5 For excavation activities in and around the ASI or state protected monuments, the Contractor shall carry out the same only after duly obtaining permits/licenses for the same in line with the provisions of the legislations governing these activities in monuments.

3.0 PRECAUTIONS FOR PROTECTION OF ENVIRONMENTAL RESOURCES

3.1 The Contractor shall ensure that construction activities do not result in any contamination of land or water by polluting substances.

3.2 Unless otherwise provided in the specifications, the Contractor shall ensure that no trees or shrubs or waterside vegetation are felled or harmed except those required to be cleared for execution of the works. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Engineer.

3.3 The Contractor shall not use or permit the use of wood as a fuel for the execution of any part of the works and to the extent practicable, shall ensure that fuels other than wood are used for cooking and heating in all camps and living accommodations. Any wood soused must be harvested legally, and the Contractor shall provide the Engineer with copies of the relevant permits, if required.

3.4 The Contractor shall take all precautions necessary to ensure that vegetation existing adjacent to the project site is not affected by fires arising from the execution of the contract. Should a fire occur in the natural vegetation or plantation adjacent to the project site for any reason, the Contractor shall immediately suppress it. Areas of forest, shrub, or plantation damaged by fire considered by the Engineer to have been initiated by the Contractor's staff or laborers shall be replanted or otherwise restored.

3.5 The Contractor shall confine operations to the dry season, use silt traps and dispose spoils in locations approved by the Engineer that will not promote instability and result in destruction of property, vegetation, irrigation and water supply. Disposal near wetlands, protected areas, and other areas that will cause inconvenience or deprive local residents of their livelihood shall not be allowed. Acidic and saline spoils shall not be spread into agricultural land.

3.6 The Contractor shall consult with local residents and local government before locating project offices, sheds, and construction plant. The work camps shall not be located near settlements, near drinking water supply intakes, protected areas, or wildlife habitats.

3.7 The Contractor shall maintain ecological balance by preventing felling of trees, water pollution and defacing of natural landscape. The Contractor shall, so conduct his cleaning operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of the archaeological site. In respect of ecological balance, the Contractor shall observe the following instructions.

3.8 In the conduct of cleaning activities and operation of equipment, the Contractor shall utilize such practicable methods and devices as reasonably available to control, prevent and otherwise minimize air/noise pollution.

4.0 NOISE AND AIR POLLUTION

4.1 All works shall be carried out without unreasonable noise and air pollution. Subject and without prejudice to any other provision of the Contract and the law of the land and its obligation as applicable, the Contractor shall take all precautions outlined in the EMP to avoid the air and noise pollution.

4.2 The Contractor shall monitor the environmental parameters periodically as specified in the monitoring plan and report to the Engineer.

4.3 The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages on account of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

5.0 OCCUPATIONAL HEALTH AND SAFETY DURING CONSTRUCTION

5.1 The Contractor shall, in accordance with the safety and health provisions specified in the EMP, provide workers with a safe and healthy working environment, in the work areas, through application of preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. The borrower/client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by

(i) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances;
(ii) providing appropriate equipment to minimize risks and requiring and enforcing its use;
(iii) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment;
(iv) documenting and reporting occupational accidents, diseases, and incidents; and
(v) having emergency prevention, preparedness, and response arrangements in place.

6.0 POST CONSTRUCTION CLEARANCE

6.1 On completion of work, wherever applicable, the Contractor shall clear away and remove from the sites all constructional plant, surplus materials, rubbish, scaffoldings and temporary works of every kind and leave the whole of the site and works in a clean condition to the satisfaction of the Engineer.

6.2 Construction camp sites post construction shall be cleared as specified in the EMP and handed over to the Owner. It will be ensured by the contractor that the site handed over is in line with the conditions of temporary acquisition signed by both parties.

Appendix 2: REA Checklist

BUILDINGS

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: **Patiala heritage conservation and tourism development project**
Sector Division: **SAUW (South Asia Urban Development and Water Division)**

Screening Questions			
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Densely populated?		✓	The project areas are located within the city at the specific project sites.
▪ Heavy with development activities?		✓	The project area does not have any heavy development activities.
▪ Adjacent to or within any environmentally sensitive areas?			
▪ Cultural heritage site		✓	The sites have rich cultural and historical heritage however, they are not in the identified list of Archeologically significant sites.
▪ Legally protected Area (core zone or buffer zone)		✓	The sites are not legally protected areas, however permissions/ consultations will be done with all the stakeholders and line of authorities.
▪ Wetland		✓	
▪ Mangrove		✓	
▪ Estuarine		✓	
▪ Buffer zone of protected area		✓	
▪ Special area for protecting biodiversity		✓	There are no indentified protected Biodiversity Areas in the project sites, however Baradari Gardens, have been known to inhabit many rare species of plants from different countries brought by the rulers of Patiala and grown for over 100 years. Special emphasis will be made for identification and conservation of those species.
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.	✓		During construction, only excavated soil is expected as solid waste which shall be disposed or reused.

Screening Questions	Yes	No	Remarks
▪ 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?		✓	Such impact is not envisaged
▪ Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		✓	The proposed improvements are not in specific ecosystems, hence no degradation of land and ecosystems are envisaged during the project implementation. However, due efforts will be made to implement the EMP to avoid any damage to Flora of the parks and garden.
▪ Dislocation or involuntary resettlement of people		✓	The proposed improvements are for the existing tourism facilities available within the areas which do not have any public settlements and are already tourist places, though in degraded state; hence R&R issues are not anticipated.
▪ Degradation of cultural property, and loss of cultural heritage and tourism revenues?		✓	The subproject emphasized enhancement of cultural heritage.
▪ 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 polluting industries?		✓	No such conditions in the proposed site.
▪ Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?		✓	The proposed improvement project will utilize very minimal- no negative impact envisaged
▪ Air pollution due to urban emissions?		✓	During construction phase, dust may arise which shall be mitigated through water sprinkling, no other significant emissions are expected.
▪ Social conflicts between construction workers from other areas and local workers?		✓	The works can be executed by local labour
▪ Road blocking and temporary flooding due to land excavation during rainy season?		✓	Road blocking and flooding is not expected in the Project
▪ Noise and dust from construction activities?	✓		Envisaged during the construction activities, adoption of the mitigation measures will effectively address such impacts during construction.
▪ Traffic disturbances due to construction material transport and wastes?		✓	There is no significant traffic impact envisaged
▪ Temporary silt runoff due to construction?		✓	Not envisaged
▪ Hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		✓	No significant ambient, household and occupational pollution are expected.

Screening Questions	Yes	No	Remarks
▪ Water depletion and/or degradation?		✓	Prior study of ground water resources are done, which shows that the underground water can be used as the source of water. As Patiala district has been identified as Areas Notified for Regulation of ground water development under the Punjab Ground Water (Control and Regulation) Act, 1998 thus rainwater harvesting through artificial recharge is envisaged to recharge the water used for construction as well as for future recharge of groundwater in the district through some of the project locations.
▪ Impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to physical cultural resources?		✓	
▪ Disturbance to precious ecology (e.g. sensitive or protected areas)?		✓	The proposed subproject components will be implemented within the project premises with minimal impacts on the flora and fauna.
▪ Alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?		✓	The proposed subproject activities do not have any impact on the surface water hydrology.
▪ Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		✓	Guidelines for siting the labor camps shall be worked out in order to avoid silt run-off and sanitary wastes onto the surface water bodies.
▪ Increased air pollution due to project construction and operation?		✓	Air pollution to the surrounding is anticipated during the project construction stage due to nature of activities
▪ Noise and vibration due to project construction or operation?		✓	Noise and vibration is anticipated during the project construction due to nature of activities
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)		✓	The proposed project area belongs to the Forest department and hence no Involuntary resettlement of the people is anticipated
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?		✓	The works can be handled by local labour. The sanitation system shall be properly designed and built so that no water pollution takes place to any water-body or water course.
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		✓	IEE/EMP stipulates adoption of good engineering practices that will prevent temporary ponding around the construction sites.
▪ social conflicts if workers from other regions or countries are hired?		✓	The works can be handled by local labour.
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	The works can be handled by local labour.

Screening Questions	Yes	No	Remarks
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		✓	No component of the subproject causes this impact.
▪ 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 construction and operation?		✓	No component of the subproject causes this impact.
▪ community safety risks due to both accidental and natural causes, 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?		✓	No component of the subproject causes this impact.
▪ generation of solid waste and/or hazardous waste?		✓	No such hazardous and solid wastes are likely to arise from the construction and labor camp.
▪ use of chemicals?		✓	Does not arise
▪ generation of wastewater during construction or operation?	✓		Wastewater will be generated from the construction and labor camps during the construction stages it will be mitigated by providing of temporary drains/ soak pits and the generated wastewater will be disposed after treatment.

A CHECKLIST FOR PRELIMINARY CLIMATE RISK SCREENING

Country/Project Title: IDIPT – Patiala heritage conservation and tourism development project
Sector: SAUW (South Asia Urban Development and Water Division)

Subsector:
Division/Department:

Screening Questions		Score	Remarks[8]
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	The proposed subproject activities are locale specific and require small scale specific conservation works /construction activities with generic impacts for the development of the project sites which can be managed through a well implemented mitigation plan. Hence no climatic impacts are anticipated at regional scale.
	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	Does not arise
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	The construction materials used for this project shall not have any impact on the climate change. However, temporary increase in temperature in the vicinity of the project area may arise during the use of hot mix macadam as pavement material where construction of Parking is required.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	Does not arise
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	Does not arise

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

[8] 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.

Other Comments: The proposed subproject is upgradation of the existing tourist facilities available within the zoological park. The proposed construction, operation and maintenance of the subproject do not have any impact on the climatic conditions.
Prepared by: Department of Tourism

Appendix 1A: A CHECKLIST FOR PRELIMINARY CLIMATE RISK SCREENING

Country/Project Title: IDIPT – Patiala heritage conservation and tourism development project
Sector: SAUW (South Asia Urban Development and Water Division)

Subsector:

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	The proposed subproject activities are locale specific and require small scale specific conservation works /construction activities with generic impacts for the development of the project sites which can be managed through a well implemented mitigation plan. Hence no climatic impacts are anticipated at regional scale.
	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	Does not arise
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	The construction materials used for this project shall not have any impact on the climate change. However, temporary increase in temperature in the vicinity of the project area may arise during the use of hot mix macadam as pavement material where construction of Parking is required.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	Does not arise
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	Does not arise

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

[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.

Other Comments: The proposed subproject is upgradation of the existing tourist facilities available within the zoological park. The proposed construction, operation and maintenance of the subproject do not have any impact on the climatic conditions.
Prepared by: Department of Tourism

Appendix -3 NOC

Eco Cabs stands in Patiala

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project ...Construction of Rickshaw stands at various locations in Patiala city...
(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 ...Various locations of Patiala City as shown in the Estimate...
(details of land/area/ building)
.....

Place: Patiala.

Date: 21.11.2013

Signature .....
Department /owner

(Official Stamp)

Counter Signed

Deputy Commissioner
PATIALA
(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The ..Various locations of Patiala City.....
(details of land/area/ building)
..... Where
the .....Construction of Rickshaw stands.....
(name of the project)
..... project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of M.C. Patiala, PWD (B&R) and Puda Patiala.....and is
(Details of the owner)
under the possession of ..Municipal Corporation Patiala, PWD (B&R),...
(Details of possessor)
PUDA, Patiala as shown in the list attached.....

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 ...Municipal Corporation, Patiala
(Name of the department/organization
.....

Place: Patiala

Date: 21.11.2013

Signature .....

Department/Organisation/Owner

(Official Stamp)

Counter Signed

29/11

Deputy Commissioner

(Official Stamp)

Deputy Commissioner
PATIALA

Proposed locations for construction of Rickshaw Stands under the grant of Punjab Heritage and Tourism Promotion Board

Sr. No	Name of Location	remarks
1	Old kotwali chowk	M.C.area
2	NIS chowk	M.C.area
3	Safabadi gate	M.C.area
4	Kaulanwala tobha, Rajpura road	NOC from B&R (National Highway) be required
5	Along boundary wall of Tara singh park	M.C.area
6	Near Tagore Theatre Model Town	M.C.area
7	Tripuri Main chowk	M.C.area
8 / 9	Samana chungi near Rajindera Hospital (2nos)	NOC from B&R (National Highway) be required
10	Thapar University chowk	NOC from B&R (National Highway) be required
11	Near Bhadson chungi	NOC from B&R be required
12	Opposite Kali Devi Mandir	NOC from B&R be required
13	Near Gurudwara Dukhniwaran sahib on Nabha Road	NOC from B&R (National Highway) be required
14	Mini Secretariat	NOC from PUDA be required
15	Sheranwala gate	M.C.Land
16	Lahori Gate	M.C.Land
17	Sirhindi gate	M.C.Land
18	Samania Gate	M.C.Land
19	Inside Bus Stand	NOC from P.R.T.C. deptt. be required
20/ 21	Railway Station (2 nos)	NOC from Railway Deptt. be required
22	Leela Bhawan Chowk	M.C.Land
23	Near State College/Bikram College	NOC from B&R be required
24	Sunami gate near Modi College	MC area
25	Opposite Hemkunt Petrol Pump, Sirhind road	MC area
26	Municipal Corporation office	MC area

The above sites for Rickshaw stands belong to different departments as mentioned against each. So, necessary permission/NOC be required from the respected department before the construction of Rickshaw Stands.

Corporation Engineer
Municipal Corporation, Patiala.

/

Annexure – I

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project ..Development of Heritage route including facade improvement and parking facilities.
(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 ....Shahi Smadhan Patiala
(details of land/area/ building)

Place: Chandigarh

Date: 26 Sept 2014

Signature .....
Department /owner

(Official Stamp)

Annexure – II

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The ...Shahi Smadhan, Patiala... (details of land/area/ building) ..... Where the ...Development of Heritage Gate including facade improvement and parking facilities... (name of the project) project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of ..... (Details of the owner) and is under the possession of ...Department of cultural affair, Archaeology & 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 ...D.C.A.M... (Name of the department/organization .....

Place: Chandigarh
Date: 26 Sept 2014.

Signature .....
Department/Organisation/Owner
(Official Stamp)

Chhatta Nanu mal and Darshini Deori, Heritage Walk

Department of Cultural Affairs, Archaeology & Museum, Punjab
Plot No. 3, Sector 38-A, Chandigarh.

DCAM/ACRH/No. 1138 **Dated:** 27/09/14

Subject:- No Objection Certificate and undertaking for Darshani Deori and Chhatta Nannu Mal at Patiala Distt. Patiala by PHTPB.

It is certified that there is no objection if the proposed project development of heritage route including façade improvement & Parking facilities for Darshani Deori and Chhatta Nannu Mal at Patiala, Tehsil & Distt. Patiala is executed by PHTPB, Department of Tourism (Punjab) as per the guide lines of Govt. of India and ADB loan funded project under the IDIPT project. These sites are under the protection of Punjab Govt. under "THE PUNJAB ANCIENT AND HISTORICAL MONUMENTS AND ARCHAEOLOGICAL SITES AND REMAINS ACT, 1964." The conservation should be done as per archaeological principals. The Department of Cultural Affairs undertakes that:-

1. There is no encroachment and no resettlement/ displacement/rehabilitation of people involved in the above Proposed Project area/building/land.
2. 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.
3. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by Department of Cultural Affairs, Archaeology & Museums, Punjab.

A management plan of the monument/building may please also be made.

Director
ਡਾਇਰੈਕਟਰ ਸੱਭਿਆਚਾਰਕ ਮਾਮਲੇ
ਪੁਰਾਤੱਤਵ ਅਤੇ ਅਜਾਇਬਘਰ, ਪੰਜਾਬ ।

Place: Chandigarh

Date: 27/09/14

Private Owner at Havelli Mohalla, Heritage Walk

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project Developmate of heritage route including facade improvement and pathway finishes (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 House no. 4384/2 Haveli walla Mohalla Chatta nanumal Patiala. (details of land/area/ building)

Shri Hukam chand S/o Shri Mangalam

Place: Patiala

Date: 27/Sep/2014.

Signature ..... Hukam Chand
Department /owner

(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The ...Shri ... hukam chand ... S/o ... Shri ... manga Ram ...
(details of land/area/ building)
...4384/2 ... Havelinwala ... Mohalla ... Chatta nanumal Where the ... development ... of ... Heritage route ... including ... facade
(name of the project)
...improvement ... and ... Parking ... facilities project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of .... and is
(Details of the owner)
under the possession of ...... House ... no., ... 4384/2 ... Havelinwala ...
(Details of possessor)
... mohalla, ... Patiala ...

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 ....
(Name of the department/organization

....

Place: Patiala
Date: 27/Sep/2014.

Signature ... Hukam Chand
Department/Organisation/Owner
(Official Stamp)

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project development of Heritage route including facade improvement and parking facili.
(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 House No. 45.71/2 Haveli walla Mohalla Chatta Nanumal Patiala
(details of land/area/ building)
Shri N.K. Aggarwal Son of Late Ram Sarup

Place: Patiala

Date: 27/9/14

Signature ..... N.K. Aggarwal
Department /owner

(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The N.K. Aggrawal Son of Late Ram Saran P. 4571/2 Badi Haveli Chatta Nanumal Patiala (details of land/area/ building) Where the development of Heritage route including Jacad. Improvement and parking facilities in Patiala (name of the project) project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of Shri N.K. Aggrawal (Details of the owner) and is under the possession of House No. 4571/2 Badi Haveli Chatta Nanumal Patiala (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 ..... (Name of the department/organization

.....

Place: Patiala
Date: 27/9/14

Signature N.K. Aggrawal
Department/Organisation/Owner
(Official Stamp)

Environment Park at Sheesh Mahal

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project Development of Environmental Park including parking facility for tourist at Sheesh Mahal, Patiala is executed by PHTPB of the Tourism Department (Punjab) through Forest Department as per the guide lines of MoEF/Govt. of India and ADB loan funded projects under IDIPT at area behind Sheesh Mahal, Patiala (16168 square metre app.)

Place: Patiala

Date: 27.9.14

Signature .....
Department /owner

ਵਣ ਮੰਡਲ ਅਫਸਰ
ਪਟਿਆਲਾ ।
(Official Stamp)

Counter Signed

Divisional Forest Officer
Patiala Forest Division
PATIALA.

Deputy Commissioner

Deputy Commissioner,
PATIALA.
(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The Area behind Sheesh Mahal Patiala (16168 square metre app.) proposed project Where the Development of Environmental Park including parking facility for tourist at Sheesh Mahal, Patiala project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of forest department and is under the possession of Forest Department.

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 Forest Department.

Place: Patiala
Date: 27.9.14

Signature .....
Department/Organisation/Owner

(Official Stamp)

Counter Signed

Divisional Forest Officer
Patiala Forest Division
PATIALA

Deputy Commissioner
(Official Stamp)

Mohindra Kothi

Department of Cultural Affairs, Archaeology & Museum, Punjab
Plot No. 3, Sector 38-A, Chandigarh.

DCAM/ACRH/No. 1139 **Dated:** 27/09/14

Subject:- **No Objection Certificate and undertaking for Mohindra Kothi at Patiala Distt. Patiala by PHTPB.**

It is certified that there is no objection if the proposed project conservation and adoptive reuse of Mohindra Kothi at Patiala Tehsil & Distt. Patiala is executed by PHTPB, Department of Tourism (Punjab) as per the guide lines of Govt. of India and ADB loan funded project under the IDIPT project. This site is under the protection of Punjab Govt. under "THE PUNJAB ANCIENT AND HISTORICAL MONUMENTS AND ARCHAEOLOGICAL SITES AND REMAINS ACT, 1964." The conservation should be done as per archaeological principals. The Department of Cultural Affairs undertakes that:-

1. There is no encroachment and no resettlement/ displacement/rehabilitation of people involved in the above Proposed Project area/building/land.
2. 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.
3. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by Department of Cultural Affairs, Archaeology & Museums, Punjab.

A management plan of the monument/building may please also be made.

Director

Place: Chandigarh

Date: 27/09/14

Department of Cultural Affairs, Archaeology & Museum, Punjab
Plot No. 3, Sector 38-A, Chandigarh.

DCAM/ACRH/No. 1144 **Dated:** 27/09/14

Subject:- **No Objection Certificate and undertaking for Nabha Fort at Nabha, Distt. Patiala by PHTPB.**

It is certified that there is no objection if the proposed project conservation and adoptive reuse of Nabha Fort at Nabha, Tehsil Nabha Distt. Patiala is executed by PHTPB, Department of Tourism (Punjab) as per the guide lines of Govt. of India and ADB loan funded project under the IDIPT project. This site is under the protection of Punjab Govt. under "THE PUNJAB ANCIENT AND HISTORICAL MONUMENTS AND ARCHAEOLOGICAL SITES AND REMAINS ACT, 1964." The conservation should be done as per archaeological principals. The Department of Cultural Affairs undertakes that:-

1. There is no encroachment and no resettlement/ displacement/rehabilitation of people involved in the above Proposed Project area/building/land.
2. 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.
3. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by Department of Cultural Affairs, Archaeology & Museums, Punjab.

A management plan of the monument/building may please also be made.

Director

Place: Chandigarh

Date: 27/09/14

NO OBJECTION CERTIFICATE

This is to certify that the Public Works Department (B&R) has no objection if the Punjab Heritage & Tourism Promotion Board (PHTPB) conserves or puts up tourism related signages in the property owned and under the jurisdiction of Public Works Department, including roads and buildings.

All these signages and conservation shall be as per the guidelines issued by the Public Works Department from time to time.

29.9.14

Chief Engineer (HQ)
Punjab PWD (B&R),
Patiala.

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project .....

QILA MUBARAK, PATIALA
(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 ....PATIALA.....

.....
(details of land/area/ building)
.....

Place: Chandigarh
Date: 27/8/14

Signature .....
Department /owner

(Official Stamp)

Director,
Cultral Affairs Archaeology & Museums, Punjab, Chandigarh

Counter Signed

Deputy Commissioner
Deputy Commissioner
PATIALA
(Official Stamp)

Quila Mubarak, Patiala

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The QILA MUBARAK, PATIALA (details of land/area/ building) ..... Where the DEVELOPMENT OF QILA MUBARAK, PATIALA (name of the project) ..... project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the ownership of DEPT. OF CULTURE (Details of the owner) and is under the possession of ..... Dept. of Cultural Affairs (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 ..... (Name of the department/organization Dept of Cultural Affairs .....

Place: Chandigarh
Date: 27/8/14

Signature .....
Department/Organisation/Owner
(Official Stamp)

Counter Signed

Director,
Cultral Affairs Archaeology & Museums, Punjab, Chandigarh

Deputy Commissioner
(Official Stamp)

Appendix -4

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.

Appendix - 5

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

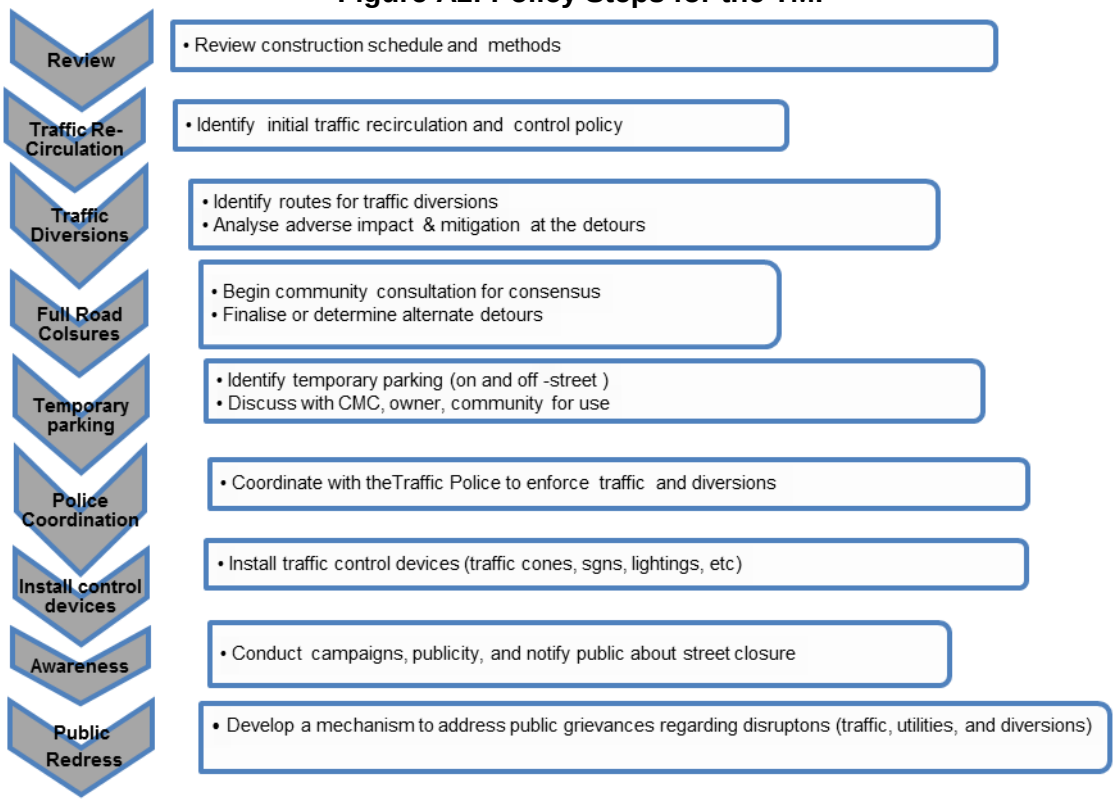
3. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- 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.

Appendix-6

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.	Patiala	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

Appendix - 7

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:	

Appendix - 8

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.

Appendix - 9

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

Appendix - 10

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**

APPENDIX 11: 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.