Initial Environmental Examination

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BAN: Third Urban Governance and Infrastructure Improvement (Sector) Project – Shahjadpur Roads and Drains Improvement Subproject (Phase 2)

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CURRENCY EQUIVALENTS

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ABRREVIATIONS

ADB	-	Asian Development Bank
AP	-	affected person
DoE	-	Department of Environment
DPHE	-	Department of Public Health Engineering
EARF	-	environmental assessment and review framework
ECA	-	Environmental Conservation Act
ECC	-	environmental clearance certificate
ECR	-	Environmental Conservation Rules
EIA	-	environmental impact assessment
EMP	-	environmental management plan
ETP	-	effluent treatment plant
GRC	-	grievance redressal cell
GRM	-	grievance redress Mechanism
IEE	-	initial environmental examination
LCC	-	location clearance certificate
LGED	-	Local Government Engineering Department
MLGRDC	-	Ministry of Local Government, Rural Development, and Cooperatives
O&M	-	operations and maintenance
PMO	-	project management office
PPTA	-	project preparatory technical assistance
REA	-	rapid environmental assessment
RP	-	resettlement plan
SPS	-	Safeguard Policy Statement
ToR	-	terms of reference

GLOSSARY OF BANGLADESHI TERMS

Crore	-	10 million (= 100 lakh)
Ghat	-	boat landing station
Hartal	-	nationwide strike/demonstration called by opposition parties
Khal	-	drainage ditch/canal
khas, khash	-	belongs to government (e.g. land)
katcha	-	poor quality, poorly built
lakh, lac	-	100,000
madrasha	-	Islamic college
mouza	-	government-recognized land area
parashad	-	authority (Pourashava)
Pourashava	-	municipality
pucca	-	good quality, well built, solid
thana	-	police station
upazila	-	sub district

WEIGHTS AND MEASURES

Ha	-	hectare
Km	-	kilometre
M	-	meter
Mm	-	millimetre

NOTES

(i) In this report, "$" refers to US dollars.
(ii) —BDT refers to Bangladeshi Taka

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PREFACE

The premises of this Initial Environmental Examination Report (IEE) are the MDS Consultant services presentation of an analysis of data and conclusions, together with its appendices.

The key elements of the IEE Report focus on: Assessment of Compliance Guidelines of Environment Safeguards according to ADB and GoB policy.

DISCLAIMER

This Initial Environmental Examination (IEE) report of Shahjadpur Pourashava under Third Urban Governance and Infrastructure Improvement (Sector) Project (UGIIP-III) has been prepared under the guidance of Team Leader and Deputy Team Leader of MDS consultant. All the data used to prepare this Initial Environmental Examination (IEE) report have been collected from the Pourashava Development Plan (PDP). Some of the information's have also been collected from the Pourashava personnel over telephone. Moreover some information's have been collected by the respective experts of MDS consultant through intensive field visit which have been used in writing this report. If any information or data or any other things coincide with other project documents that are beyond our knowledge and fully coincidental event and we express apology for that

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EXECUTIVE SUMMARY

1. The Government of Bangladesh (GOB) has undertaken the Third Urban Governance and Infrastructure and Improvement (Sector) Project (UGIIP-III) with financial assistance from the Asian Development Bank (ADB) ADB Loan NR-3142 BAN (SF)/1626P OFID together with co-financing from OFID to improve governance and urban service provision in selected 31 (thirty one) Pourashavas over a period of 6 years (2014 to 2020). The overall objective of the Project is the construction, rehabilitation, expansion and implementation of sub-projects of essential existing infrastructure and utility facilities for the urban sector of Bangladesh; to develop a well-structured augmentation/rehabilitation program and implement according to prioritization.

2. Under the PPTA project for UGIIP-III, Environmental Assessment and Review Framework (EARF) were prepared and the same were endorsed by both the funding agencies and GoB to be adopted for implementation of the UGIIP-III project. The frameworks specified the screening procedures and the guidelines for identifying the APs, estimating the compensation and assistance to be paid for the losses, grievance redress mechanism, preparation of IEE and EIA and the institutional requirements for monitoring the implementation of environmental safeguard aspects of the project. The IEE of Shahjadpur Pourashava has been prepared following the PPTA format.

3. Variety of sub-projects have been undertaken under UGIIP-III, potential environmental impacts of a local nature can be expected and cover a wide spectrum. Accordingly, the criteria for selection or exclusion of sub-projects address concerns related to potential significant or irreversible negative environmental impacts.

4. Potential environmental impacts stem from poor or improper location, planning and design practice. Construction impacts in a local setting and within the local community can be significant, even though of short duration and limited extent.

5. Government of Bangladesh (GoB) law and ADB policy require that the environmental impacts of development projects be identified and assessed as part of the planning and design process, and that action be taken to reduce those impacts to acceptable levels. This is done through the screening/impact assessment process, which has become an integral part of all ADB lending operations, project development and implementation.

6. The Shahjadpur Pourashava roads and drains sub-project is one of the sub-projects proposed under UGIIP-III. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. This Initial Environmental Examination (IEE) study was carried out based on the feasibility study and detailed engineering designs prepared during project implementation and may be updated during implementation stage to reflect any changes and latest subproject needs.

7. Categorization: An environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for roads (Appendix 3) was conducted and results of the assessment show that the sub-project is unlikely to cause significant adverse impacts. Shahjadpur Pourashava roads and drains sub-project is classified as environmental category B as per ADB SPS. This initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts as a result of the sub-project.

8. The project has been classified as environment 'Category B' by criteria in the Environment Policy of the ADB and Environmental Assessment Guidelines (November 2002) as applied by the ADB Urban Development Division, South Asia Department. Category B projects are "judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects." As a result "an initial

environmental examination (IEE) is required to determine whether or not significant environmental impacts warranting an EIA are likely."

9. As per DoE, GoB, most of the project under UGIIP-III have been categorized as Orange-A and Orange-B. Water treatment plant, water distribution line laying/relaying/ extension, landfill/dumping ground, and bus and truck terminals are in Red Category.

10. DoE has issued an Environment Clearance Certificate (ECC) for UGIIP-III Project which fall under Orange A and Orange B Categories vide letter DoE/Clearance/5444/ 2015/187 dated 02.05.2016. Accordingly, only Red Category subprojects require the Environmental Assessment process including EIA for Environmental Clearance.

11. Considering all the above following steps were adopted by the MDS Consultant's team for Environmental Safeguard compliance –

(i) Review of the available Environmental safeguard documents and categorization of the project as per ADB and GOB guidelines.
(ii) Separate Consultation with MDS team members, PMO staffs and PIU staffs to explain the importance of the safeguards.
(iii) Separate Workshop on safeguard policies for all Municipal Engineers, EE and AE of all the Pourashavas under UGIIP-III
(iv) Screening and re-categorization of each and every scheme with the help of REA checklist transect walk and public consultation for individual schemes during visit to individual project scheme sites.
(v) Preparation of sector subproject IEE for each sector subproject for each Pourashava.
(vi) Preparation of ToR for conduction of EIA to get environmental clearance from DoE, GoB for Red category projects.

12. Implementation arrangements: Local Government Engineering Department (LGED) and Department of Public Health Engineering (DPHE) are the executing agencies (EA). LGED is responsible for providing support and guidance to Pourashavas concerning performance criteria and Pourashava development planning. Department of Public Health Engineering (DPHE) will provide support in water supply and sanitation schemes. Implementation activities will be overseen by a Project Management Office (PMO). The participating Pourashavas are the implementing agencies, with a project implementation unit (PIU) within the Pourashava structure. Consultant teams are responsible for (i) detailed engineering design, contract documents preparation and safeguards facilitation; (ii) project management and administration support; (iii) assistance in supervising construction; (iii) strengthening of local governance, conducting required studies/surveys and (iv) awareness raising on behavioral change in water, sanitation and solid waste management activities.

13. Description of the environment: Subproject components are located in Shahjadpur Pourashava urban area or in its immediate surroundings which were developed into urban land uses. The subproject sites are located in existing right of ways (ROWs) and government-owned land. There are no protected areas, Cultural heritage site, wetlands, mangroves, or estuaries in or near the subproject location. There are no forest areas within or near Shahjadpur Pourashava.

14. 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 were reduced through mitigation measures in the preliminary design stage. The EMP will form part of the civil work bidding and contract documents.

15. Locations and siteing of the proposed infrastructures were considered to further reduce impacts. The concepts considered in the design of the Shahjadpur Pourashava roads

and drains subproject are: (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; (ii) prioritizing rehabilitation over new construction using public right of ways (RoWs), and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts; (iii) avoiding where possible locations that will result in destruction/disturbance to historical and cultural places/values; (iv) avoiding tree-cutting where possible; (v) 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.

16. During the construction phase, impacts mainly arise from (i) disturbance of residents, businesses, and traffic; (ii) need to manage excess construction materials and spoils; and (iii) community and workers health and safety. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation. Measures such as conducting work in lean season and minimizing inconvenience by adopting best construction methods will be employed. Traffic management will be necessary during excavation works on busy roads. 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.

17. Mitigation measures have been developed to reduce all negative impacts to acceptable levels and will be assured through a program of environmental monitoring. The monitoring program will include observations on and off-site, document checks and interviews with workers and beneficiaries. The PMO will submit semi-annual monitoring reports to ADB which will include a detailed review of EMP implementation, including corrective actions taken.

18. Consultation, disclosure and grievance redress: The stakeholders were involved in developing the IEE through discussions on-site 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 in the Pourashava and will be disclosed to a wider audience via the ADB and LGED project 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. A grievance redress mechanism is described within the IEE to ensure any public grievances are addressed quickly.

19. Monitoring and reporting: The PMO, PIU (Shahjadpur Pourashava), and Management Design and Supervision Consultants (MDSC) will be responsible for safeguard monitoring. The MDSC will submit monthly monitoring reports to PMO, and the PMO will send semi-annual monitoring reports to ADB. ADB will post the semi-annual environmental monitoring reports on its website as part of its disclosure requirements.

20. Conclusions and recommendations: The citizens of Shahjadpur Pourashava will be the major beneficiaries of this subproject. The proposed subproject is unlikely to cause significant adverse impacts and net environmental benefits to citizens of Shahjadpur Pourashava will be positive. 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.

21. 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.

I. INTRODUCTION

A. Purpose of the Report

22. Bangladesh has a population of approximately 162 million and has experienced increased rapid urbanization with the growth of many secondary towns over the last three decades. About 28 per cent of the total population now lives in urban areas where the population growth rate is much higher than the overall national growth rate. With the present high increase-trend in urban population, it is justifiably anticipated that by year-2020, such populace will constitute nearly 40 percent of the national aggregate. One principal cause of such rapid growth is the presence of better opportunities spanning economic, communication, education, health and other social aspects in the urban areas. It is worth noting that by one account, in countries of Bangladesh's standing, around 55-60% of a country's aggregate economic activities takes place within the urban confines.

- These municipalities include: Three (3) sample PSs are : 1) Naogaon 2) Magura and 3) Lalmonirhat
- Seven (7) non-sample priority PSs are: 4) Kishoregonj, 5) Muktagachha, 6) Netrokona, 7) Sherpur, 8) Bera, 9) Charghat and 10) Rajbari.
- The remaining twenty one PSs (target PSs) are: 11) Chapai Nawabgonj, 12) Habigonj, 13) Moulvibazar, 14) Laxmipur, 15) Chhatak, 16) Joypurhat, 17) Laksham, 18) **Shahjadpur**, 19) Rangamati, 20) Ishwardi, 21) Meherpur, 22) Nabinagar, 23) Panchagarh, 24) Jessore, 25) Bandarban**,** 26) Khagrachhari, 27) Kotalipara, 28) Nilphamari, 29) Chuadanga, 30) Benapole and 31) Tungipara.

23. The Shahjadpur Pourashava roads and drains sub-project is one of the sub-projects proposed under UGIIP III. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. This Initial Environmental Examination (IEE) study was carried out based on the feasibility study and preliminary engineering designs prepared during project preparation and have been finalized during detailed design stage to reflect any changes and latest subproject designs.

24. **Categorization:** An environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for roads (Appendix 3) was conducted and results of the assessment show that the sub-project is unlikely to cause significant adverse impacts. Shahjadpur Pourashava roads and drains sub-project is classified as environmental category B as per ADB SPS. This initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.

25. The Project Log Frame gives the project goal as: sustained improvements in the urban environment and quality of life in participating municipalities by 2020. The project purpose is: expanded access to and usage of urban infrastructure and services, and improvement in urban governance in all participating municipalities by 2020. The objectively verifiable indicators are:

- Improved citizen perception of the urban environment, municipal services and quality of life
- Improved quality and standard of urban infrastructure and municipal services

26. UGIIP-III represents the continued development of the ADB approach to urban development in Bangladesh. It is a valuable model for comparison with other approaches and for replication by other agencies and in other countries. UGIIP-III has broad goals such as developing infrastructure facilities, and improving services, urban governance, accountability, the urban environment and quality of life. UGIIP-III will improve infrastructure

through roads, water supply, sanitation, solid waste management, drainage and municipal facilities sub-projects.

B. Project Types Identified for Implementation

27. Infrastructure sub-projects proposed under UGIIP-III encompass a variety of types of urban infrastructure and services including those shown in Table 1.

Table 1: Sub-projects and Components Proposed in UGIIP-III

Water Supply	Source Augmentation	Deep Tube Wells (Hand Pump)
		Deep Tube Wells (Production Pump
	Distribution	Piping, Valves and Fittings
	Treatment	Water Treatment (Iron and Arsenic Removal)
	Storage	Elevated Tank
	System improvement	Repair/Replacement of Lines
		Bulk Water Meters
		Domestic water meter
Sanitation	Community Facility	Community Toilets
	Public Facility	Public Toilets
	Septic Tank	Vacuum Units
Solid Waste Management	Disposal / Waste Collection	Disposal Alternatives
		Neighbourhood Collection
	Waste Transfer	Community Storage Bins
		Dump Trucks/Rickshaw
	Waste Disposal	Transfer Station
		Access Road to Landfill
		Landfill Facility
		Treatment/Composting
Urban Drainage	Roadway Drainage	Roadside Drains
	Area Drainage	Outfall
		Main Drain
		Secondary and Tertiary Drains
		Retention Pond
Urban Transport & communication	Roadway Provision	Bridge Replacement Drainage/Culverts
		Roadway Widening/Resurfacing
Slum	System Improvement	Repair/Replacement of Lines
	Community Facility	Community Toilets
	Septic Tank	Vacuum Units
Public use facilities	Municipal Facilities	Market/Community Centres
		Municipal and Kitchen Markets
		Improvement of Slaughterhouses
		Bus and Truck Terminals

Potential Impacts from Activities

28. A Sector Initial Environmental Examination (SIEE) has been conducted for the overall UGIIP-III project during the PPTA and sub-project IEEs was prepared for each of the PS subprojects identified during the PPTA. The SIEE sought to identify any regional and cumulative impacts that may result from the sector intervention. Cumulative impacts were all in the social or human development sphere of the environment, and all were found to be positive. No direct cumulative or regional potential negative impact of the project activities on environmental resources and values was detected.

29. From the variety of sub-projects undertaken under UGIIP-III, potential environmental impacts of a local nature can be expected and cover a wide spectrum. In general these were determined not to be significant or irreversible, and precautionary measures have been taken (and incorporated into guidance, management plans and implementation frameworks) to avoid or reduce them. Even the criteria for selection or exclusion of subprojects address potential significant or irreversible negative environmental impacts.

30. The ADB has categorized UGIIP-III project as Category B and following its normal procedure has determined that an IEE will be conducted for each municipality subproject submission. The impacts of subprojects will be assessed according to ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009.

31. UGIIP-III the impact will be improved living environment in project towns. The outcome will be improved municipal service delivery and urban governance in project towns. Project towns are pre-selected 31 towns to be supported in an integrated manner under the project. UGIIP-III will improve existing and provide new municipal infrastructures including (i) roads; (ii) drainages; (iii) water supply system; (iv) solid waste management facilities; (v) slaughterhouses; (vi) markets, community center/auditorium, bus and truck terminals and river ghats; (vii) public toilets; and (viii) others such as provision for street lighting and improvement of slums.

C. Extent of the IEE Study

32. Government of Bangladesh (GoB) law and ADB policy require that the environmental impacts of development projects are identified and assessed as part of the planning and design process, and that action is taken to reduce those impacts to acceptable levels. This is done through the environmental assessment (EA) process, which has become an integral part of lending operations and project development and implementation.

II. POICY, LEGAL AND ADMINISTRATIVE FRAMWORK

A. ADB Policy

33. 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 ADB investments.

34. **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 4(Four) categories:

(i) Category A. Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
(ii) 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.
(iii) Category C. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
(iv) 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.

35. This Initial Environmental Examination (IEE) study for Shahjadpur Pourashava roads and drains sub-project was carried out based on the feasibility study and preliminary engineering designs prepared during project preparation and have been finalized during detailed design stage to reflect any changes and latest subproject designs.

36. **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.

37. **Public disclosure:** ADB will post the following safeguard documents on its website. Relevant information from these documents will also be disclosed in local communities in a form and language understandable and accessible to the public.

(i) for environmental category A projects, draft EIA report at least 120 days before Board consideration;
(ii) final or updated EIA and/or IEE upon receipt; and
(iii) environmental monitoring reports submitted by the Project Management Office (PMO) during project implementation upon receipt.

B. GoB National Policy

38. Implementation of all subprojects will be governed by the environmental acts, rules, policies, and regulations of the Government of Bangladesh. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. Many of these are cross-sectorial and several of them are directly related to environmental issues. The most important of these are the Environment Conservation Act, 1995 (ECA, 1995), and the Environment Conservation Rules (ECR, 1997).

39. Table-2 presents specific requirements for the Shahjadpur Pourashava roads and drains subproject. Provides the environmental standards for air, surface water, groundwater, drinking water, emissions, noise and vehicular exhaust.

Table 2: Applicable Government of Bangladesh Environmental Legislations

Legislation	Requirements for the Project	Relevance
Environmental Conservation Act of 1995 and amendments in 2000, 2002 and 2010	• Restriction on operation and process, which can be continued or cannot be initiated in the ecologically critical areas • Regulation on vehicles emitting smoke harmful to the environment • Remedial measures for injuries to ecosystems • Standards for quality of air, water, noise and soil for different areas for various purposes and limits for discharging and emitting waste • Environmental guidelines	The provisions of the act apply to the entire subproject in the construction and operation and maintenance (O&M) phases.
Environmental Conservation Rules of 1997 and amendments in 2002 and 2003	• Environmental clearances • Compliance to environmental quality standards	The subproject is categorized as Orange-B and requires location clearance certificate (LCC) and environmental clearance certificate (ECC). All requisite clearances from DoE shall be obtained prior to commencement of civil works.
Forest Act of 1927 and amendments (2000)	• Clearance for any felling, extraction, and transport of forest produce	Considered in subproject preparation and implementation.
Bangladesh Climate Change Strategy and Action Plan of 2009	• Ensure existing assets is put in place to deal with the likely impacts of climate change. • Enhance the capacity government ministries, civil society and private sector to meet the challenge of climate change	Considered in subproject preparation and implementation.
Bangladesh Labor Law of 2006	• Compliance to the provisions on employment standards, occupational safety and health, welfare and social protection, labor relations and social dialogue, and enforcement • Prohibition of employment of children and adolescent	Considered in the EMP.

C. Government of Bangladesh Environmental Assessment Procedures

40. Under ECA, 1995 and ECR, 1997 industrial units and projects are classified into four categories according to “their site and impact on the environment” and size of investment, and each category (Green, Orange-A, Orange-B and Red) requires a different level of environmental assessment as a prerequisite for the Department of Environment (DoE) in granting the LCC and ECC that allow the project to proceed.

41. As per Schedule 1 of ECA, 1995 Shahjadpur Pourashava roads and drains subproject is likely to be classified as Orange-B category (Table 3). Thus ECC is required from the DoE prior to commencement of the subproject.

Table 3: Likely Government of Bangladesh Classification of Shahjadpur Pourashava Roads & Drains Subproject

Subproject	Component	Equivalent in Schedule I of ECR	DoE Classification
Roads and Drains	Road provisions (include Road Rehabilitation/Construction, road resurfacing, road signs, intersection, T-Junction, Sharp bend improvement & RCC Drain Construction)	Rehabilitation/Construction and extension of road (feeder road, local road) & RCC Drain Construction	Orange – B

42. DoE has 30 days to respond to receipt of the ECC application for an Orange-B category project.

43. This IEE will serve the basis for the ECC application and will be supplemented to fulfill any additional government requirements.

III. DESCRIPTION OF THE SUBPROJECTS

A. The Study Area

44. Shahjadpur Pourashava is located at 24°04' and 24°25' north latitudes and in between 89°31' and 89°31' east longitudes and has a poura area of 11.91 sq km (2942 acre). It is bounded by Ullahpara and Belkuchi upazilas on the north, Bera and Santhia upazilas on the south, Chauhali upazila on the east, Pabna and Ullahpara upazilas on the west. The Pourashava has 09 wards.

45. This report contains the Initial Environmental Examination (IEE) for the roads & drains sector improvement subproject, in Shahjadpur Pourashava and Shahjadpur Upazilla, Sirajgonj District under Rajshahi Division (Figure 1). It discusses the potential environmental impacts and mitigation measures relating to the location, design, construction and operation of physical works proposed under these 20 roads and two drains schemes, in two packages namely **UGIIP-III-2/SHAH/UT+DR/01/2016 and UGIIP-III-2/SHAH/UT+DR/02/2016**.

46. Subproject components are located in Shahjadpur Pourashava urban area or in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at these sites. The subproject sites are located in government-owned land. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject location. There are no forest areas within or near Shahjadpur Pourashava. The location map is shown as Figure 1.

B. Indigenous People Safeguard

47. Indigenous People Planning Framework (IPPF) is required to provide guidance and appropriate mitigation measures to the ethnic minority (advise). Out of 31 Pourashavas taken up under UGIIP-III, there is possibility of affecting indigenous people only in Bandarban, Rangamati, Khagrachhari, Moulavibazar, Sherpur, Panchagarh, Muktagachha and Chapai Nawabgonj Pourashava etc. The project activities are located only within the urban areas and no ethnic communities/indigenous people's communities will be affected by the project activities. So preparation of Indigenous People Plan (IPP) document following IPPF will not be required.

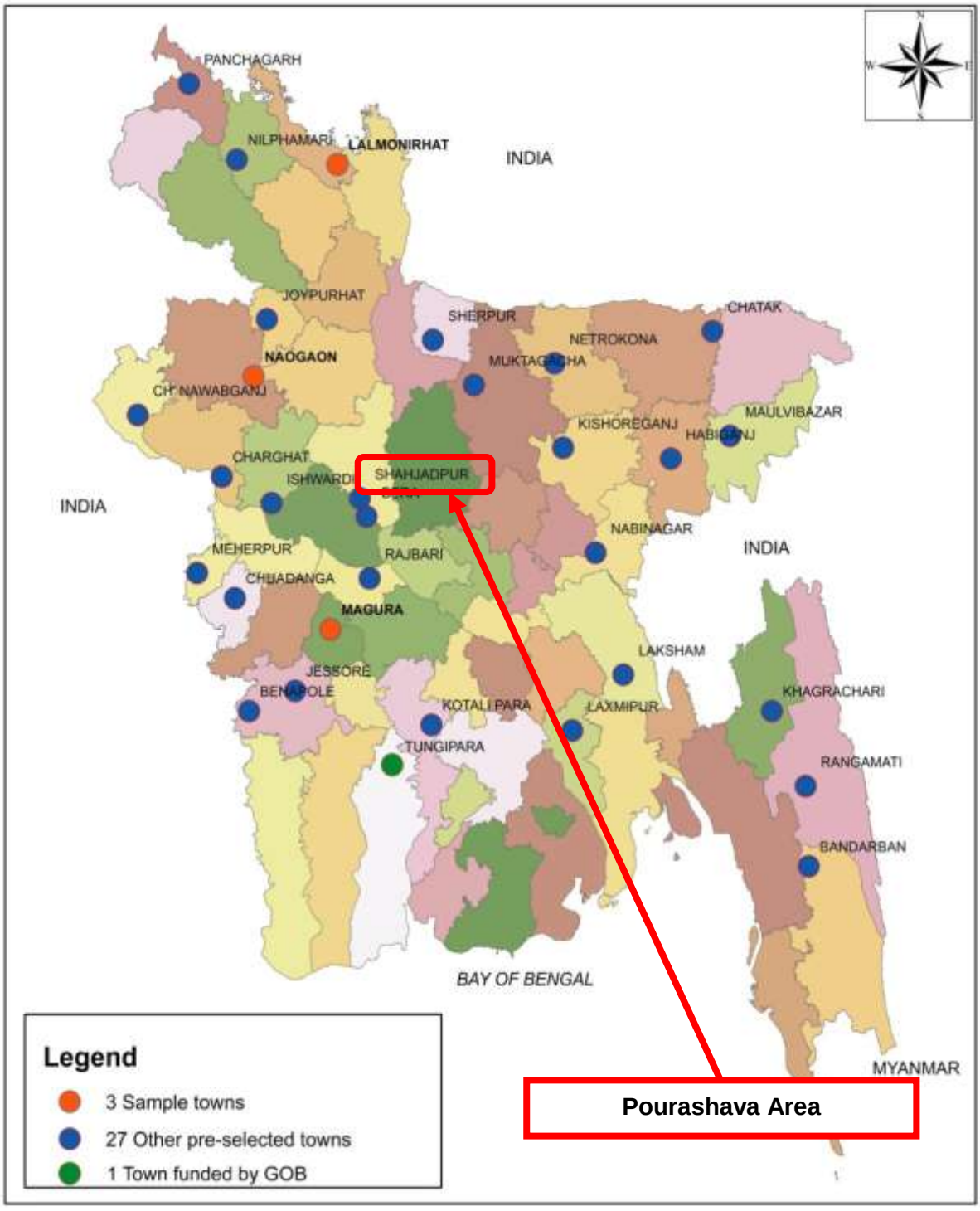

Figure 1: Pourashava under UGIIP –III

C. Existing Condition and Need for the Project

48. Shahjadpur Pourashava has a road and drain network of a total length of road 78.915 km and drain 9.65 km. Most of these roads & drains have uneven-rough surface, damaged topping and pavement sides, narrow in width and without roadside footpath and thus incapable of accommodating road traffic. The road surfaces are worn out partly and in some cases entirely. Though the Pourashava is not flood prone but as the houses nearby roads are much higher than the roads, the water from houses cause water logging on the roads

because of insufficiency in number of drains for drainage of water especially during rainy season. Justifiably, they call for intervention varying from normal significant maintenance to large improvement/reconstruction. Table 4 presents a summary of the existing roads & drains and their conditions in the Pourashava.

49. The total length of the roads & drains in Shahjadpur Pourashava is 78.915 km & 9.65 km and generally fall in to three roads categories, viz Paved road, HBB road and Earthen road. The drains are of three types too. They are RCC drain, Brick drain and Earthen drain. Existing roads & drains conditions in Shahjadpur Pourashava are given in Table 4.

Table 4: Existing roads and drains and their conditions in Shahjadpur Pourashava

Sl	Road type	Length in km	Existing condition
1	Paved Road	31.90	Around 20% in good condition
2	HBB Road	20.445	5% in good condition
3	Earthen	26.57	100% in bad condition
	Total	**78.915**	Overall condition of the roads is not good

Sl	Drain type	Length in km	Existing condition
1	RCC	6.25	Around 70% in good condition
2	Brick	1.90	Nearly 90% in bad condition
3	Earthen	1.50	100% in bad condition
	Total	**9.65**	Overall condition of the drains is not good

Pourashava road and drain with badly damaged surface and displaying poor maintenance

D. Proposed Components

50. Figure 2-5 shows the locations of the proposed roads and drains in the Shahjadpur Pourashava.

51. Roads and drains necessary for rehabilitation were surveyed by the project consultants during the sub-project preparation stage and an inventory of required works was conducted with the assistance of the Pourashava engineers considering (i) all necessary issues and findings such as existing conditions, type, formation level (rise), widening, shoulder/footpath, side-drain, cross-drain/culvert, etc; (ii) roads with high target beneficiaries; and (iii) strategically important roads that have good linkage in the development of road communication networks. The identified roads were finalized through the workshop organized in the Pourashava in the presence of the mayor, councilors, Engineers and invited officials from relevant organizations.

52. To accommodate climate change related inundation and annual floods, each road and drain was assessed against whether: (i) existing crest level is 600 millimeters (mm) above existing normal flood level; (ii) road embankments are protected against annual floods; and (iii) drainage is adequate to accommodate rainfall runoff. Appendix 4 outlines proposed standards and additional climate change measures for level of service for proposed roads & drains.

53. The major considerations adopted for design were as follows: (i) LGED's road design manual and standards followed. The road design type 6 for BC pavement was considered, with some modifications; (ii) guidelines on climate change resilience and adaptation measures (Appendix 3) were studied and accommodated as necessary; and (iii) existing bitumen finished surface (BFS) and HBB roads were considered for improvement with CC or reinforced cement concrete (RCC)pavement where necessary, with modified design standard. In general, the following are the major features of the roads and design guidelines:

(i) The roads lying on low level of lands are vulnerable to flood water and/or rainwater and hence require CC/RCC surface instead of asphalt surface. Roads lying on low-lands with heavy traffic loads will be improved with RCC and DBC surface works.
(ii) The roads with poor quality of side drains will be improved along with side drain improvement by replacing the existing brick-drains with RCC drains to withstand heavy traffic loads.

54. Table 5 presents the proposed roads & drains for rehabilitation/re-construction in Shahjadpur Pourashava Figures 6 to 8 show the typical sections of different types of road & drain that may be used in the subproject. This IEE covers **twenty roads with total length of 17.773 km and two drains with total length of 546 m** (Phase-2, Table 5) to be rehabilitation/re-construction under Phase 2 (see implementation schedule). This IEE has been updated with the final roads and drains designs.

Table 5: Proposed Roads and Drains for Rehabilitation/Construction in Shahjadpur Pourashava

SL. No	Financial Year	Pkg. No.	PDP Serial No	Name of Road and Drain	Length in Metre	Estimated Amount(TK)			Remarks
						Gross Amount(Tk)	Salvage (Tk)	Net Amount(Tk)	
	2015-2016	UGIIP-III-2/SHAH/UT+DR/01/2016		**Road**					
1			**19**	Improvement of road starting from Barabill Shamsul house to Nalua Shahjahan house (Ch.00-1851m) & Connecting road Starting from Nalua Milk Co-oparative Centre to Hannan house by RCC (Ch.00-200m)	**2051**	**30,245,659.81**	**3226957.89**	**27,018,701.92**	**No Impact**
2			**18(B)**	Improvement of road starting from Barabill Mortoz daroga house to Barabill uttor para Mosque by RCC (Ch.00-1279m)	**1279**	**15,496,302.76**	**1018579.94**	**14,477,722.82**	
3			**1**	Improvement of road starting from Shahzadpur Dak-Banglo to Dabaria High way via Dabaria Mosque by DBC (ch 00-1795m)	**1795**	**8,899,856.87**	**124830.72**	**8,775,026.15**	
4			**10(a)**	Improvement of road starting from Shaktipur BC Road to Pukurpar kaseem Zadda BC more via Pukurpar Aziz more by DBC (ch 00-926m).	**926**	**3,258,732.96**	**0.00**	**3,258,732.96**	
5			**10(b)**	Improvement of road starting from Pukur par Aziz more to Pukurpar Golam Nabi house DBC (ch 00-665m)	**665**	**2,199,448.04**	**75297.60**	**2,124,150.44**	
6			**16**	Improvement of road starting from Rambari Monihar Cinema hall to Hazir ghat Mosque by DBC (Ch.00-545m)	**545**	**1,402,471.83**	**0.00**	**1,402,471.83**	
7			**TLCC**	Improvement of road starting from Part: (A) Kandapara Upazila gate to Shishu Hospital by DBC (Ch.00-307m) Part: (B) Zila porished market to Varuadha Samsia Rokib Hospital by DBC (Ch.00-458m). Part: C) Upazila DPHE office to mokkhoad more by DBC (Ch.00-238m) Part:(D) Bangabandhu Soroni by DBC (Ch.00-186m)	**1189**	**4,231,144.20**	**0.00**	**4,231,144.20**	
8			**50**	Improvement of road starting from Barabill patchpara Jailal house to Bayan house by HBB (ch 00-375)m. & Connecting road starting from Hazi Julfiquer house to Barabill sarder para Mosque by HBB (ch 00-35m)	**410**	**8,986,523.28**	**0.00**	**8,986,523.28**	
9			**TLCC**	Improvement of road starting from Monirampur Darul Ulum Madrasha to Batar more by DBC (ch 00-570m)	**570**	**2,144,878.57**	**0.00**	**2,144,878.57**	
				Sub-Total of Road Amount =	**9430**	**76,865,018.32**	**4,445,666.15**	**72,419,352.17**	
				Drain					
10			**8**	Construction of RCC Drain Starting from Monirampur Sobahan shop to Monirampur Darul Ulum Madrasha. (Ch.00-213m)	**213**	**2,186,715.32**	**0.00**	**2,186,715.32**	**No Impact**
				Sub-Total of Drain Amount =	**213**		**0.00**		

						2,186,715.32		**2,186,715.32**	
			Total Package Amount=		**R=9430 D=213**	**79,051,733.64**	**4,445,666.15**	**74,606,067.49**	

SL. No	Financial Year	Pkg. No.	PDP Serial No	Name of Road and Drain	Length in Metre	Estimated Amount(TK)			Remarks
						Gross Amount(Tk)	Salvage (Tk)	Net Amount(Tk)	
	2015-2016	**UGIIP-III-2/SHAH/UT+DR/02/2016**		**Road**					
1			**20**	Improvement of road starting from Nalua Taltola to Nalua Milk Co-oparative centre via Nalua Madrasha to Barabill Patchpara Hazi hassen house by RCC (ch 00-1000m) Connecting road starting frrom Barabill patch para more to Barabill Nasir house by RCC (ch 00-370m)	**1370**	**21,818,534.24**	**1884291.02**	**19,934,243.22**	**No Impact**
2			**62,39**	Improvement of road starting from Part: (A) Kandapara Hazi Akter house to Kandapara G,primary school by HBB(ch 00-355m). Part: (B)Kandapara Mojnu house to Kandapara Greaveyeard by HBB (ch.00-330m). Part: C) Kandapara Ad Masud house to saifuddin house by HBB (Ch.00- 310m)	**995**	**5,899,661.98**	**0.00**	**5,899,661.98**	
3			**66**	Improvement of road starting from Part: (A) Parkola Jalal mir Bridge to Enjed house by HBB (ch 00-400m) Part: (B) Parkola Gobindo Master house to Parkola Hanif Prosess mill road by HBB (ch 00-280m) Part: (C) Bisic G,P, Tower to Aigbari shaktipur Mannan house by HBB (ch 00-180m).	**860**	**8,646,105.10**	**0.00**	**8,646,105.10**	
4			**TLCC**	Improvement of road starting from Part: (A) Kandapara Nagor Bari High way to Laily house by HBB (ch 00-185)m. Connecting road starting from Kandapara New Mosque to Baher house by HBB (ch 00-204m) Part: (B) Shearkhali Ad. Hakim house to Shearkhali mainal house by HBB (ch 00-190m) Part: (c) Upazila DPHE Office to shearkhali Abdul Hamid house by HBB (ch 00-264)m.Connecting road starting from Shearkhali Ripon house to Golam house by HBB (ch 00-135m)	**978**	**5,657,184.68**	**0.00**	**5,657,184.68**	
5			**TLCC**	Improvement of road starting from Part: (A) Barabill dakkhin para HBB Road to Lovelu house by HBB (ch 00-140m) Part: (B) Barabill dakkhin para HBB Road to Bridge via Nurul PK by HBB (ch 00-160m)	**300**	**4,892,500.39**	**0.00**	**4,892,500.39**	
6			**46**	Improvement of road starting from Barabill Abu Soma house to Barabill Moddhapara Mosque via Barabill Greave yeard by HBB (ch 00-610m)	**610**	**5,988,495.15**	**0.00**	**5,988,495.15**	

SL. No	Financial Year	Pkg. No.	PDP Serial No	Name of Road and Drain	Length in Metre	Estimated Amount(TK)			Remarks
						Gross Amount(Tk)	Salvage (Tk)	Net Amount(Tk)	
7			**36**	Improvement of road starting from dabaria Ali Akbar house to dabaria Taher house via Dabaria Graveyeard by HBB (ch 00-605m)	**605**	**9,676,261.20**	**0.00**	**9,676,261.20**	
8	**2015-2016**	**UGIIP-III-2/SHAH/UT+DR/02/2016**	**TLCC**	Improvement of road starting from Shaktipur sarkar Bari Mosque to G.Primary School by HBB (ch 00-378)m. Connecting road starting from Shaktipur Bridge to mozid house by HBB (ch 00-22m)	**400**	**6,650,297.71**	**0.00**	**6,650,297.71**	**No Impact**
9			**TLCC**	Improvement of road starting from Dargapara Madrasha to Ruppur Pir Shahab vita by DBC (ch 00-1015m)	**1015**	**3,645,697.75**	**101848.32**	**3,543,849.43**	
10			**67**	Improvement of road starting from Aigbari Parkola High way to Prannathpur kalidash more by DBC (ch 00-645m).	**645**	**2,331,377.28**	**65197.44**	**2,266,179.84**	
11			**TLCC**	Construction of road starting from Prannathpur Poschim para Mosque to Taltola BC road by RCC (ch 00-485m) & Connecting road starting from Taltola Robi Lal house to Taltola Sakowat house by RCC (ch 00-80m)	**565**	**4,284,779.19**	**0.00**	**4,284,779.19**	
				Sub-Total of Road Amount =	**8343**	**79,490,894.67**	**2,051,336.78**	**77,439,557.89**	
				Drain					
12			**11**	(a) Construction of RCC Drain starting from dariapur Mannan Bishwas house to dariapur charokkhola Existing RCC drain Ch(00-253)m. (b) Construction of RCC Drain starting from dariapur Rashia Professor house to Shahdat shop. (Ch.00-80m)	**333**	**2,665,849.19**	**0.00**	**2,665,849.19**	**No Impact**
				Sub-Total of Drain Amount =	**333**	**2,665,849.19**	**0.00**	**2,665,849.19**	
				Total Package Amount=	**R=8343 D=333**	**82,156,743.86**	**2,051,336.78**	**80,105,407.08**	
				Total two Package Amount=	**R=17773 D=546**	**161,208,477.50**	**6,497,002.93**	**154,711,474.57**	

E. Implementation Schedule

55. Implementation of UGIIP-3 is split up into 3 phases: (i) 1st phase = 24 months or 2 years; (ii) 2nd phase = 30 months or 2.5 years; and (iii) 3rd phase = 24 months or 2 years.

56. Substantial time is required spanning the continuum of subproject preparation, approval, survey, design & estimate, contract award and contract execution. Efforts needs to be made to meticulously follow the schedule should a timely implementation of work is aimed at.

57. Usually, the construction work season in Bangladesh runs from October through May (eight months). Construction works are sometimes impeded for the following reasons.

- Early floods in April/May,
- Late floods in September/October,
- Natural calamities (cyclone/tornado, excessive floods) occur in April/May and October/November.

58. Normally, the best construction period is only for 6 months a year (October to March). But construction of Road and Drain may take more time due to adverse weather situations. In these reason, total construction time is proposed for 01 year.

59. However, sometimes, based on time constraint or exigency, construction work may even need to be carried out in the monsoon. Besides, whenever possible, simultaneousness of activities can be ascertained and cashed in on and consequently, quantum of work can be maximized through efficient planning and adoption of best available practice. Summing up, over a 12-month period, execution of major works are advisable to take place between December, 2016 to November, 2017. A tentative time-schedule for implementation (only as an indication) is shown overleaf.

Sub-projects Implementation schedule for Package Nr. UGIIP-III-2/SHAH/UT+DR/01/2016 & UGIIP-III-2/SHAH/UT+DR/02/2016																
Period : September '2016 – December '2017																
	YEAR															
	2016				**2017**											
	MONTH				**MONTH**											
Item of works	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Compliance of Sub-project and approval	■															
Preparation of the bid documents		■														
Tendering of the sub-project and the work order			■													
Execution of physical work				■	■	■	■	■	■	■	■	■	■	■	■	
Final inspection and complete certification																■

Figure 2: Proposed Road Sub-projects under Package-1 (Phase-2) Shahjadpur Pourashava

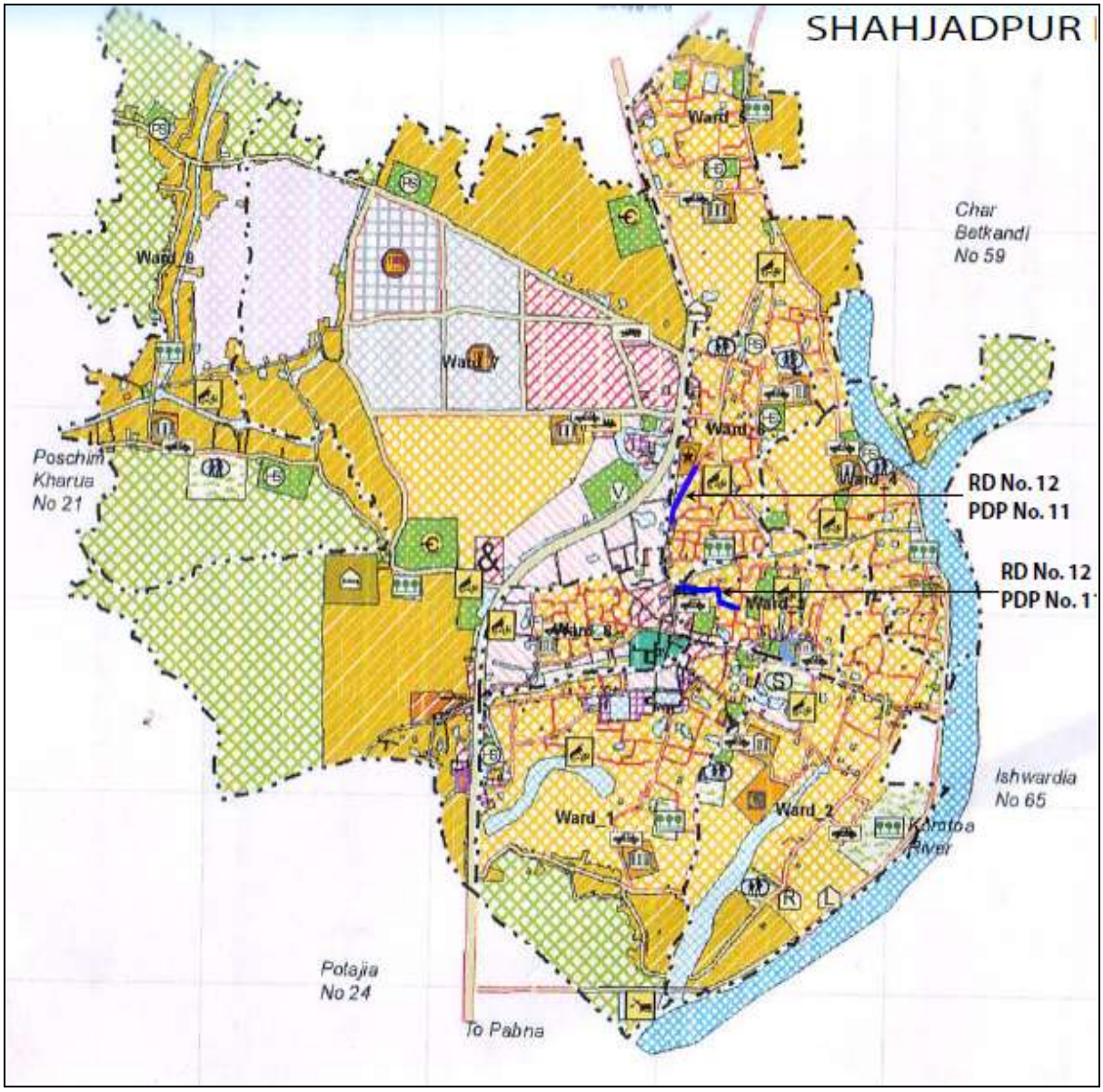

Figure 3: Proposed Drain Sub-projects under Package-1 (Phase-2) Shahjadpur Pourashava

Figure 4: Proposed Road Sub-projects under Package-2 (Phase-2)

Shahjadpur Pourashava

Figure 5: Proposed Drain Sub-projects under Package-2 (Phase-2) Shahjadpur Pourashava

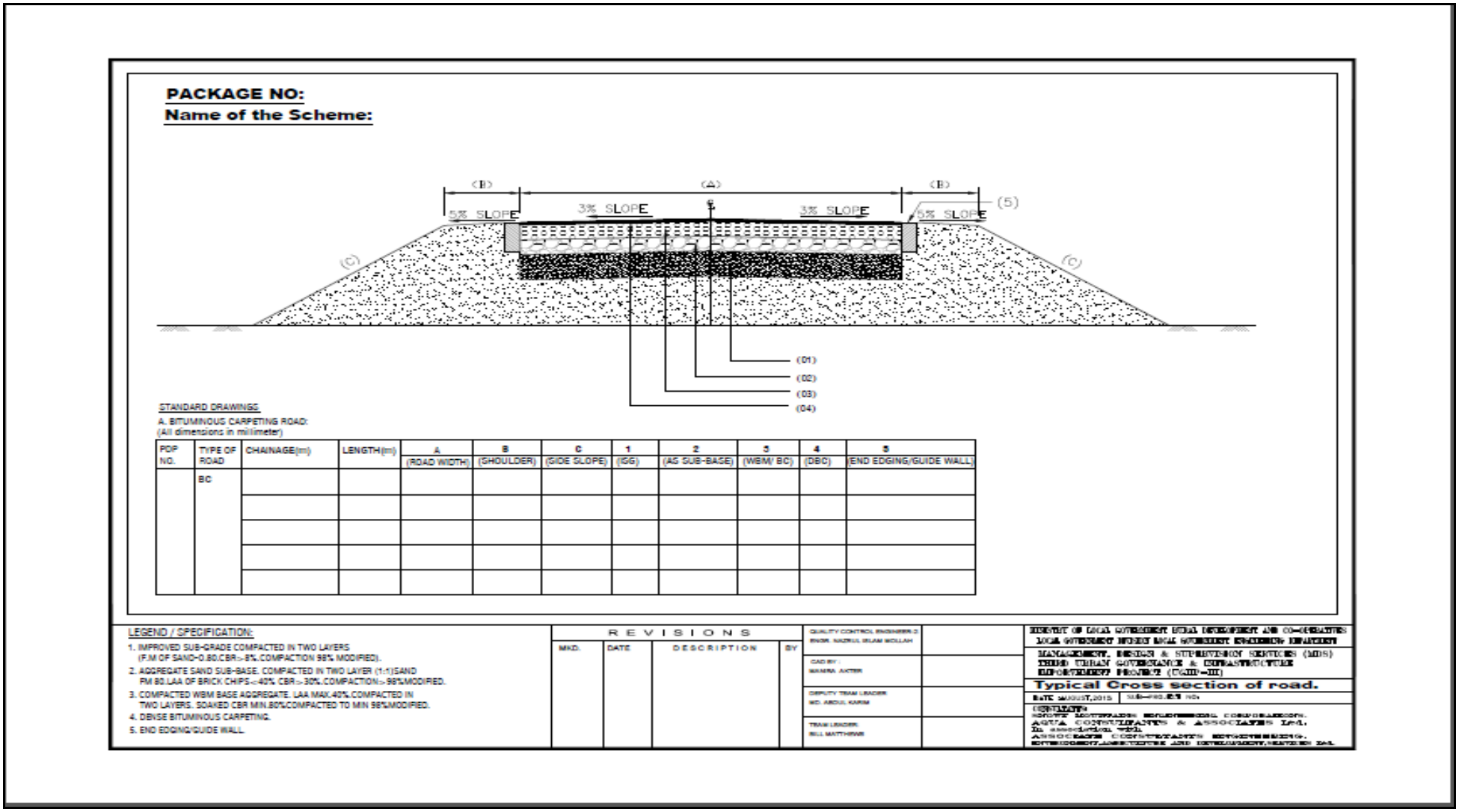

Figure 6: Typical Cross-Section of Bituminous Carpeting Road

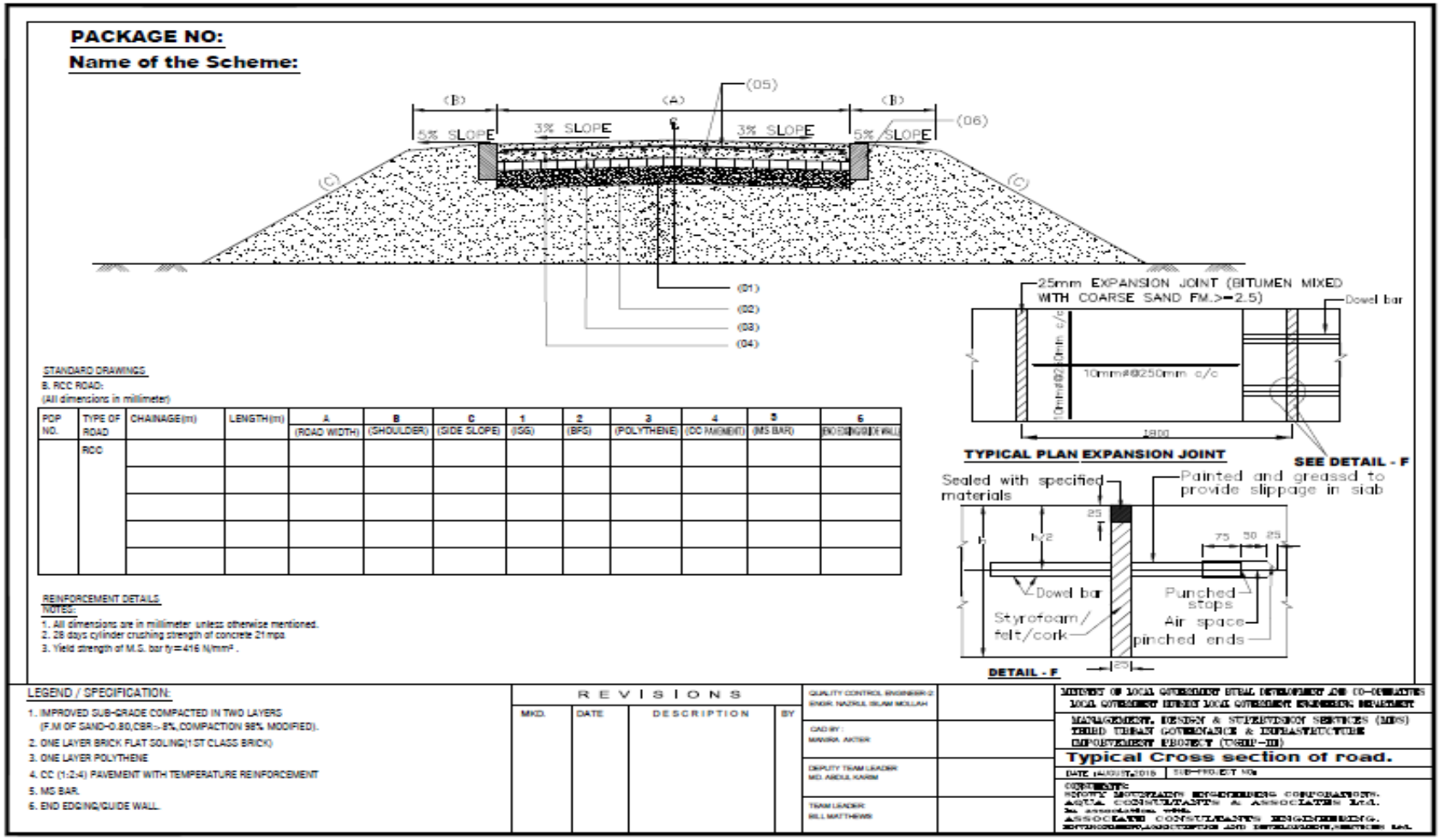

Figure 7: Typical Cross-Section of CC Road

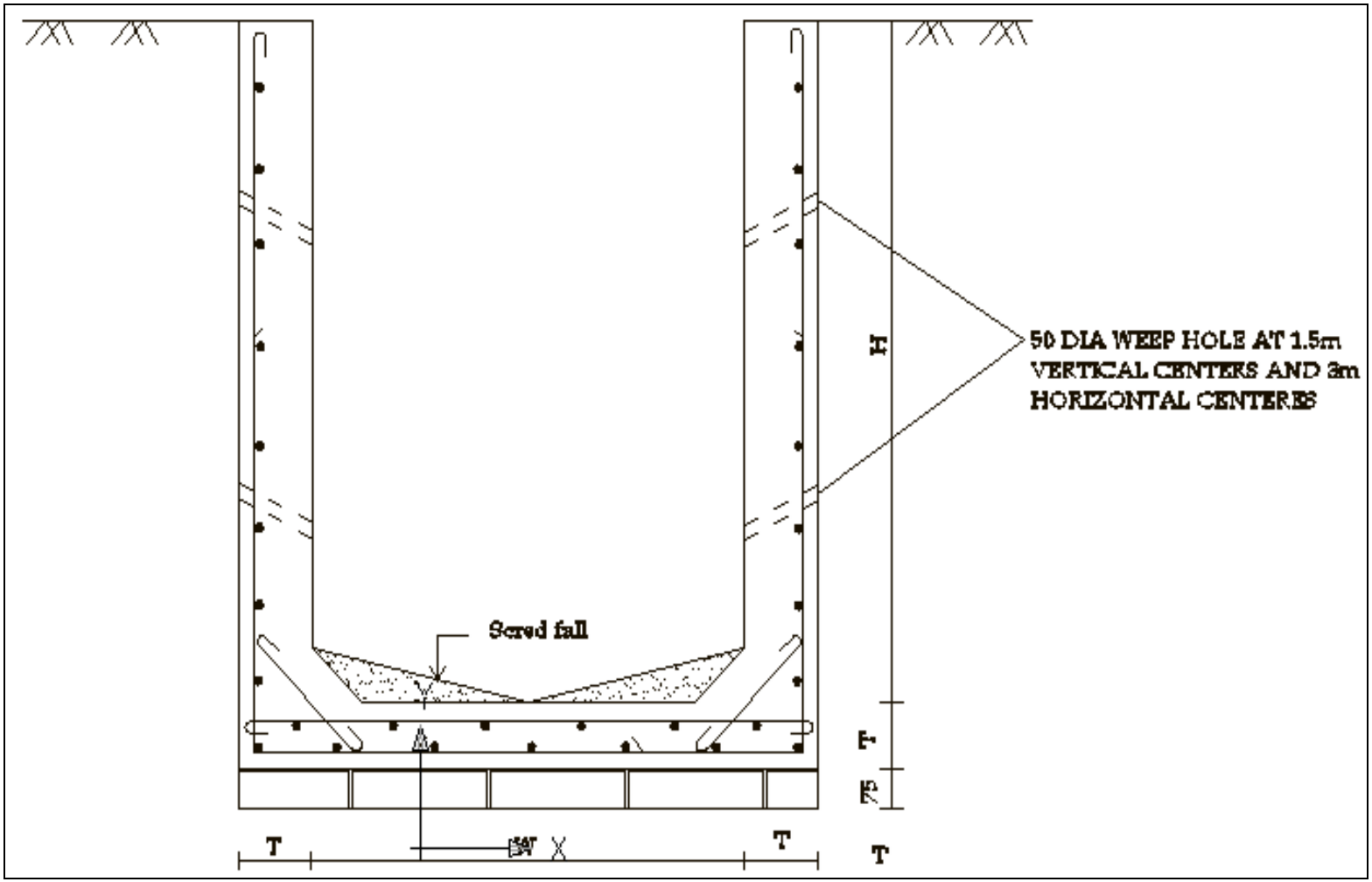

Figure 8: Typical Reinforced Cement Concrete U-drain

Figure 9: Shahjadpur Upazila Location Map

IV. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for the Baseline Study

60. Data collection and stakeholder consultations: Data for this study has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field visits to the proposed subproject sites. The literature survey broadly covered the following:

(i) subproject details, reports, maps, and other documents available with the ADB consultants, MDS consultants, LGED, and Shahjadpur Pourashava;
(ii) relevant acts and extraordinary gazettes, and guidelines issued by Government of Bangladesh agencies; and
(iii) literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and environmental planning documents collected from Government of Bangladesh agencies and websites.

61. Several visits to the subproject sites were made to assess the existing environment (physical, biological, and socioeconomic) and gather information with regard to the proposed sites and scale of the proposed subproject. Demographic information, archaeological and religious places, densely populated pockets, and settlements were gathering from PDP and other documents.

62. Data analysis and interpretation: The data collected was analyzed and interpretations made to assess the physical, biological, and socioeconomic features of the project area. The relevant information is presented in the succeeding paragraphs.

63. **Updating during detailed design phase:** The IEE including specific description of the environment and corridor of impact has been updated as necessary based on the final roads design and alignments.

B. Physical Characteristics

64. **Topography, soil and Geology:** Shahjadpur topography is naturally plain. The elevation is 16 meter above the mean sea level. According to the Bangladesh Geological Survey map, Shahjadpur is located beside Karotoya River. Within Padma Flood Plain & Barabill Flood Plain. Halua ghat Khal passing through the Shahjadpur Pourashava. There is not sufficient drainage system for discharge of water. As a result, water logging occurs regularly during rainy seasons.

65. **Climatic conditions:** The climate in the Pourashava area sultry during extended summer season, which covers from March to June. Shahjadpur is included as the medium climate area. Temperature, rainfall and humidity of Shahjadpur are at moderate condition. Significant rising trends were found in highest maximum post-monsoon temperature. Lowest minimum monsoon temperature and highest maximum temperature from July to October, June and August for lowest minimum temperature. Falling trends were found in annual highest maximum and lowest minimum temperatures, pre-monsoon highest maximum temperature, lowest minimum winter temperature and January lowest minimum temperature. The annual average temperature reaches a maximum of 34.6 °C, and a minimum of 11.9° C. The annual rainfall is 1610 mm (63.4 in).

66. **Surface water and other bodies of water:** The canal passing through the Shahjadpur Pourashava which meets with Karotoya River. The water of this canal is contaminated due to drainage connection with the locality and markets. So, there is no opportunity to use this canal water for Shahjadpur Pourashava. There are many small ponds in various locations within the Pourashava. There are large numbers of ponds, ditches, low lying agricultural lands as low pockets in Shahjadpur which act as retention basin to delay the maximum floods in the monsoon and to recharge the underground water reservoir.

67. **Air quality:** As there are no major industries in Shahjadpur the main sources of air pollution are vehicles and non-point sources such as open burning. There are currently no air quality monitoring stations are in operation within the Pourashava limit. The baseline air quality will be measured by the subproject contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

68. **Acoustic environment:** Subproject components are in the built-up part of Shahjadpur Pourashava with residential, commercial, and institutional establishments. The volume of traffic that passes through these sections is not significant and traffic jams are not frequent. However vehicular movement can be considered as major cause of noise pollution. The baseline noise level will be measured by the subproject contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

C. Biological Characteristics

69. **Flora and fauna:** The Encyclopedia of Flora and Fauna of Shahjadpur is the outcome of a long-felt need. Subproject components are located in Shahjadpur urban area or in its immediate surroundings which were converted into urban use for years ago, and there is no natural habitat left at these sites. Animals and plants in the subproject area are those commonly found in urban and built-up areas. No endangered/protected species of either flora or fauna are found in the Pourashava or its immediate surroundings.

70. **Protected areas:** There are no protected forests, wetlands, mangroves, or estuaries in or near the subproject area.

D. Socioeconomic Characteristics

71. **Area and population:** Shahjadpur Pourashava occupies an area of 11.91 km^2. The whole number of people or inhabitants in Shahjadpur is 472505. It is divided into 9 wards. The population density is 539673 persons per sq km. The rate of population increase is 2.44%.

72. **Land use:** The study of the land use pattern is based on extensive physical survey which was accomplished through GPS system. Total cultivable land 1978.86 acre; water body 171.16 acre; single crop land 46.20%, double crop 43.1% and treble crop land 10.7%. Among the peasants, 25% are landless, 22% marginal, 32% small, 16% intermediate and 5% rich; cultivable land per head 0.031 acre.

73. **Existing provisions for pedestrians and other forms of transport:** Shahjadpur Pourashava has an aggregate 78.915 km road and 9.65 km drain network. Observably, most of these roads have uneven-rough surface, damaged topping and pavement sides owing to lack of maintenance, mostly narrow in width, hence incapable of accommodating generated traffic. While visiting different roads, the team observed that the surfaces are worn out partly and in some cases entirely. Justifiably, they call for intervention varying from normal significant maintenance to large Rehabilitation/reconstruction.

74. Being on the Dhaka-Shahjadpur National Highway, a huge number of buses and trucks move both ways, through Shahjadpur. Shahjadpur Pourashava is well connected with different parts of Bangladesh. The navigation through water ways is not in use now, as the reverine routes are not navigable at present. The Pourashava has fairly large two bus terminal. But over the years, it is lying un-attended. Its maintenance is very poor. There is no government-owned truck terminal in Shahjadpur. Currently, trucks are promiscuously parked for loading and unloading at different points of the Pourashava, disrupting urban life.

75. **Drainage:** The proposed sub-project consists of 02 nos. of drains intervention in Shahjadpur Pourashava that stand included under the 02nd phase of the implementation of UGIIP III. The scopes of the said Drainage are briefly described below. It goes without

saying that provision of a functional drainage system is an imperative for a Model Town. With this view in the perspective, efforts will be there to improve the drainage system in the Pourasava to reduce water-logging and its related congestion in the town. The current sub-project includes 02 (two) RCC Drains picked up on a priority basis consequent upon discussion with the Pourasava authority. According to the implementation time-schedule, all these drains will be completed within the 02nd phase. From the above depiction, it will be evident that in all 02 drains will be included in the current sub-project.

76. The MDS team has visited a large section of the Pourashava core area after a rainfall and found many water-logged area. Drainage system in these areas were inadequate, hence could not properly ease such congestion. In some areas drains were found without any outfall and congestion caused by solid waste dumping and earth filling led to the virtual closure of the drains. The Pourashava as well as the general people agreed that some of the drains were built without any outfall and improper gradient and proper checking of construction-time invert levels.

77. **Other existing amenities for community welfare.** : The Pourashava expanded in an unplanned arrangement. Major installations, commercial and residential areas grew along the main highway and roads. The town has an average literacy rate of 57.55%. It has 11 primary School, 06 college, 4 High School, 9 Madrasha. 95% of the households have electricity connection.

E. Historical, Cultural and Archaeological Characteristics

78. Important historical and cultural sites at the eastern side of the Pourashava there is a milk producing factory called Milk Vita and an oil depot. Pabna- Dhaka highway passes through the Pourashava. The Jamuna Multipurpose Bridge is only 7 km east of the Pourashava. The Historic Majar Sharif of Hazrat Makhdum Shah Yeameni ®, many mosques, Rabindra Kuthibari of Rabindranath Tagore and Historic cloth selling hat, etc. are situated in the poura area.

79. The proposed twenty roads and two drains are not within nor adjacent to these sites.

80. **Ecological Resources:** The ecological setting is mostly with wetland, homestead and roadside vegetation, etc. Homestead vegetation has a positive effect on improvement of soil moisture through the shading and mulching process. Trees growing at homesteads also provide easy access to fuel wood, fodder and other products. A large number of multipurpose trees (fruit, timber, fodder, medicine) are grown in the area. The most common among them are jackfruit, mango, lemon, banana, etc. Some Mangrove vegetation has been noticed in the area. Two major types of fauna viz. terrestrial and aquatic fauna have been identified in and around the area.

81. **Birds, Wildlife and Wetland Habitats:** Other than common birds like crows, sparrows, shaliks, cuckoos etc. and some domestic cattle, no wild animals inhabit the area. Wildlife that fully depends on the terrestrial land throughout their whole life for shelter, food, nesting, breeding and producing offspring is called terrestrial fauna. The main types of terrestrial fauna are amphibian, reptile, bird and mammal. Aquatic habitats are common in the project area due to the numerous freshwater lowlands, ponds, wetlands and rivers coursing through the area. Fish diversity in rivers and streams is decreasing due to heavy pollution in the aquatic bodies from industrial effluent.

V. ASSESSMENT OF ENVIRONMENTAL IMPACTS AND SAFEGUARDS

A. Methodology

82. Issues for consideration have been raised by the following means: (i) input from interested and affected parties; (ii) desktop research of information relevant to the proposed subproject; (iii) site visits; and (iv) evaluation of proposed design scope as per Consultants study and potential impacts.

83. The corridors of impact considered include: (i) existing alignment and width of roads to be rehabilitated/improvement; and (ii) existing ROWs. No additional land is required beyond the ROWs. Categorization of the subproject and formulation of mitigation measures have been guided by ADB's REA Checklist for Roads & drains (Appendix-3) and ADB SPS, 2009.

B. Screening out Areas of No Significant Impact

84. From the and detailed designs, and results of the rapid environmental assessment, it is clear that implementation of Shahjadpur Pourashava roads and drains subproject will not have major negative impacts because activities will be localized/site-specific and short in duration. Moreover, the corridors of impact of the subproject will be on existing public ROWs, and construction will be conducted within a relatively small area. Because of these there are several aspects of the environment that are not expected to be affected by the subproject (Table 6).

Table 6: Fields in which the Subproject Components Not Expected to Have Significant Impacts

Environmental components	Anticipated impacts
Topography, Landforms, Geology and Soils	Required amount of materials will not cause alteration of topography, landforms, geology and soils. Erosion hazard is insignificant as trenching and excavation works will be conducted only during construction stage (short-term) and specific to sites along public ROWs.
Climate	Short-term production of dust is the only effect on atmosphere. However, impact is short-term, site-specific and within a relatively small area. There are well developed methods for mitigation.
Biodiversity	Activities being located in the built-up area of Shahjadpur Pourashava will not cause direct impact on biodiversity values as identified flora and fauna are those commonly found in built up areas. The construction activities do not anticipate any cutting of trees.
Geology and Seismology	Small excavation will not be large enough to affect
Surface Water	No river, lakes, pond will be affected
Ground Water	Only surface water will be used for construction
Fisheries & Aquatic Biology	No river, lake, or pond will be affected
Wildlife & Rare or Endangered Species	Project roads are not located in any ecological sensitive area
Coastal Resources	Roads are not in a coastal area
Development of Agriculture, Minerals & Tourism	None of these developments is near the site
Population & Communities	Construction will not affect population number, location or composition

85. In the roads and drains sector Sub-project packages UGIIP-III-2/SHAH/UT+DR/01/2016 & UGIIP-III-2/SHAH/UT+DR/02/2016, there are minor impacts that result from the planning, design or location, because:

- The road and drain improvements confined within the existing road boundary.
- No acquisition of land will be required
- No tree will need to be cut
- No water logging problems were observed.
- Some Sub-project schemes need palisading
- There is no impact on permanent and temporary structures
- Road alignment is neither passing through nor connecting any ecological sensitive area like forests, reserve forest, National Park or wildlife sanctuary.
- Road alignments are not located in any ecological sensitive area so there is no impact on wildlife, or rare and endangered species.
- There is no impact on water body
- There is no impact on any water supply source like tube wells/hand pumps, wells, etc.
- There is no impact on any community structure
- There is no impact on irrigation structures
- There is no impact on religious structures
- There are no historical/archaeological sites in the alignment
- Most of the schemes of the packages are relatively small and involve straightforward construction and operation, so impacts will be mainly localised and not significant.
- Most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving trenching and other excavation. However the routine nature of the impacts means that most can be easily mitigated.
- Infrastructure will be installed and constructed in public rights-of-way, easements, Drains and properties held by the Pourashava, hence land acquisition and encroachment on private property will not occur.
- The Drain improvements activities will be confined within the existing Drain boundary.
- Drain alignment is neither passing through nor connecting any ecological sensitive area like forests, reserve forest, National Park or wildlife sanctuary

C. Anticipated Impacts and Mitigation Measures – Planning and Design Phase

86. **Subproject selection criteria:** The project environmental assessment and review framework specifies environmental criteria to avoid or minimize adverse impacts during the identification and finalization of road subproject. Table 7 summarizes criteria and design considerations as per final design.

Table 7: Site and Design Considerations to Meet EARF Environmental Criteria

Sl No	Components	Environmental Selection Guidelines	Remarks
1.	Overall Selection Guideline	i. Comply with all requirements of relevant national and local laws, rules, and guidelines.	- Requisite LCC and ECC to be obtained prior to commencement of works
		ii. Avoid/minimize where possible locations in protected areas, including notified reserved forests or biodiversity conservation hotspots (wetlands, national reserves, forest reserves, and sanctuaries).	- Not present in Shahjadpur Pourashava

Sl No	Components	Environmental Selection Guidelines	Remarks
		iii. Avoid possible locations that will result in destruction/disturbance to historical and cultural places/values.	--Use of “chance find” procedures in the EMP that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.
		iv. Avoid tree-cutting where possible. Retain mature roadside trees which are important/valuable or historically significant. If any trees have to be removed, plant two new trees for every one that is lost.	-Permit for tree-cutting to be obtained by contractor/sprier to commencement of work -Compensatory plantation for trees lost at a rate of 2 trees for every tree cut, in addition to tree plantation as specified in the design, will be implemented by the contractor, who will also maintain the saplings for the duration of his contract.
		v. Ensure all planning and design interventions and decisions are made in consultation with local communities and include women. Reflect inputs from public consultation and disclosure for site selection.	- All consultations during project preparation are documented and concerns expressed by public addressed in the IEE.
		vi. Synchronize all road improvement and pipe laying works (to extent possible) to minimize disturbance and optimize use of resources (e.g., water pipes laid prior to road improvements).	-Considered in the design
2.	Roads and Drains Improvement	i. Include the provision of new or improved storm water drainage to remove the increased runoff caused by increasing the road surface area	-Considered in the design
		ii. Include tree planting alongside roads to provide a natural barrier to noise and visual impacts, and include additional man-made barriers where suitable for public safety.	-included in the EMP

Table 8: Possible Actions to Mitigate against Project Effects of Climate Change and Improve Climate Resilience for Road and Drain

A.	Climate Change Effect	Mitigation Measures
1.	Increased rainfall quantity and runoff Increased frequency of storms	• Improve O&M, organizational capacity, resource allocation, etc. • Work with relevant stakeholders to manage water use and flood discharges more effectively • Improve collection and disposal of solid waste • Control encroachments • Improve public behaviour through active and prolonged information, education and communication campaigns to reduce uncontrolled solid waste disposal, encroachments, damage to infrastructure, unregulated development in key areas, etc., supported by enforcement. • Guide wall to protect erosion and sliding for roads with adjacent water bodies/ponds
B.	**Impact Factor**	**Mitigation Measures**
1.	Construction materials' quality	• Choose most durable materials possible, even if higher cost, e.g. concrete, high quality bricks. • Monitor and control construction quality
2.	Rising temperatures	• Execute works during most favourable times of year and day. • Monitor and control preparing, placing and curing concrete and mortar, to ensure placement, etc., during most favourable times. • Use plain high-quality un-rendered brickwork and high quality cement mortar in preference to rendered low-grade bricks • Use sulphate resisting cement in vulnerable locations (higher heat gain during curing) or cement containing fly ash (less heat gain, so preferred).
3.	Runoff	• Use trapezoidal section side drains with small low-flow section (cunette) for low flows • Line side drains to achieve higher discharge velocities without increasing risk of scour, etc.

Source: MDS Consultants team

D. Anticipated Impacts and Mitigation Measures – Construction Phase

87. In the case of this subproject (i) most of the individual elements are relatively small and involve straightforward construction, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in the built-up area of the Pourashava, will not cause direct impact on biodiversity values.

88. **Construction method:** Trenches will be dug by backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed nearby, and the materials (brought to site on trucks and stored on unused land nearby) will be placed in the trench by crane or using a small rig. The infrastructures will be constructed manually according to design specifications. Any excavated road will be reinstated.

89. There is sufficient space for a staging area, construction equipment, and stockpiling of materials. However, the contractor will need to remove all construction and demolition wastes on a daily basis.

90. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project sites in built-up areas of Shahjadpur where there are a variety of human activities, will result to impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are short-term, site-specific and within a relatively small area. There are no impacts that are significant or complex in nature, or that need an in-depth study to assess the impact. Thus, Shahjadpur roads & drains subproject is unlikely to cause significant adverse impacts. The potential adverse impacts that are associated with construction activities can be mitigated to acceptable levels with the following mitigation measures (Table 9).

E. Anticipated Impacts and Mitigation Measures – Operations & Maintenance Phase

91. In the operations and maintenance (O&M) phase, the roads and drains will operate with routine maintenance, which should not affect the environment. Routine repairs and unblocking of side drains will be very small in scale, to conducted manually by small teams of men with simple equipment (shovels, wheelbarrows, etc.) and works will be very short in duration, thus will not cause significant physical impacts. Traffic may be interrupted temporarily but this work will be very small in scale, infrequent, and short in duration, so there will be no economic or other implications. The infrastructures 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. O&M will be the responsibility of Shahjadpur Pourashava local authority, which will be given training by this project.

92. To maintain the safety of workers and road-users, such work should be coordinated with the local police department so that adequate warning signs and traffic diversions can be set up when necessary. Debris/sediments from drainages need to be collected and disposed at a designated site such as the landfill. It is important that the designated disposal site's base is of a non-permeable membrane in order to prevent leach ate that can contaminate the soil and groundwater. The potential adverse impacts that are associated with O&M activities can be mitigated to acceptable levels with the following mitigation measures (Table 9).

Table 9: Anticipated Impacts and mitigation Measures at Construction and Operations & Maintenance Phase

Sl. No	Potential Environmental Issues	Duration/ Extent	Magnitude	Mitigation Measures & Method	Responsibility
1.	**Sub-Project Impacts**				
1.1	Loss of land for the construction of Third Urban Governance Improvement Sector Project (UGIIP-III)	Permanent	Major	• No land acquisition and resettlement impacts are anticipated as the proposed project shall be restricted to the existing government land available with PS.	PIU/ PMO (LGED)
1.2	Lack of sufficient planning to assure long term sustainability of the improvements	Permanent	Minor	• The sub-project design shall include adequate provisions for ensuring effective maintenance and protection of the created assets so as to ensure the long term sustainability of the sites.	PIU/ PMO (LGED)
1.3	EMP Training	Not applicable	Not applicable	• PMO will provide training to contractors onsite specific EMP highlighting waste management and OHS, GRM and reporting	PIU/ PMO (LGED)
1.4	Sire-EMPs	Not applicable	Not applicable	• Develop Site-EMPs, responding to all clauses and requirements of this EMP, and including sub-plans such as Spill Management Plan, Waste Management Plan, Temporary Traffic Management Plan, Occupational Health and Safety Plan, Soil Erosion Control Plan, and others.	MDS/Contractor
2.	**Construction Stage**				
2.1	Excavation of material to fill will change drainage, air & soil quality, topography at extraction site	Permanent	Minor	• Excess material from other project site should be used to fill the excavated site. • Grading of the site should be done properly to minimize the problem • Site may be used for ground water recharge pit/ small fish pond act.	MDS/ Contractor
2.2	Transportation of material could create dust	Temporary	Minor	• Use tarpaulins to cover sand when carried on trucks • Spray ramps and soil stockpiles with water in dry weather	MDS /Contractor
2.3	Dust could be blown from soil stockpiled on site	Temporary	Minor	• Excavation schedule should match with the filling, so that dug material can be used immediately without stockpiling	Contractor
2.4	Rain may collect in dug areas and wash soil off stockpiles	Temporary	Minor	• Conduct excavation and ground works in dry season	Contractor

Sl. No	Potential Environmental Issues	Duration/ Extent	Magnitude	Mitigation Measures & Method	Responsibility
2.5	Some owners will lose land needed for the subproject	Permanent	Minor	• Purchase land as described in Resettlement Framework • Avoid taking >10% of the total land of any occupant	LGED/MDS
2.6	Some business premises may need to be removed	Permanent	Minor	• Compensate business owners/tenants for lost income • Compensate owners for lost income generating assets	PIU/ PMO (LGED)
2.7	Shops that remain close may lose income if access is difficult for customers	Temporary	Minor	• Compensate owners/tenants for lost business income • Keep road closure minimum (Frequency and distribution) • Maintain vehicle and pedestrian access when possible • Develop and apply protocol to protect chance find (excavation observed by archaeologist; stop work if finds are suspected; state authority to plan appropriate action)	PIU/ PMO (LGED), MDS and contractor
2.8	People living nearby may be disturbed by Air quality, noise, dust	Temporary	Minor	• Inform community of work in advance; address concerns • Plan work with community ; avoid work at sensitive times • Avoid conducting noise-generating activities at night • Reduce dust by spraying soil and covering with tarpaulins • Use modern vehicles / machinery and maintain as specified • Monitor air quality	Contractor
2.9	Workers and the public are at risk from accidents on site	Temporary	Minor	• Prepare and implement a site Health and Safety Plan that includes measures to : • Exclude the public from site • Ensure that workers use Personal Protective Equipment (PPE) • Provide Health & Safety Training for all personnel; • Follow documented procedures for all site activities; • Keep accident reports and records	Contractor

Sl. No	Potential Environmental Issues	Duration/ Extent	Magnitude	Mitigation Measures & Method	Responsibility
2.10	Construction Camp and stock yard	Temporary	Minor	• Design all infrastructure to avoid locations of sensitive locations • Camp location and material handling methodology should be submitted to MDS for approval	Contractor
2.11	Economic benefits if local people are employed in Contractor's workforce	Temporary	Minor	• Contractor goal to employ at least 50% of workforce from communities in vicinity of work site	MDS / Contractor
2.12	Road and rail traffic will be disrupted by construction work	Temporary	Minor	• Plan work with road, rail and town authorities and police • Keep road closures to a minimum • Maintain safe passage of vehicles/pedestrians at all times • Provide effective diversions & alternative routes if needed • Conduct work that requires road and railway closure at times when traffic volume is low • Conduct work near railway at times when trains are fewer • Schedule material deliveries for periods of low traffic	Contractor
2.13	Existing infrastructure could be damaged by construction	Permanent	Major	• Determine locations of water pipes, electricity pylons, etc and design scheme to avoid damage	MDS
2.14	Roads/people may be disturbed by repeated excavation	Temporary	Minor	• Integrate subprojects to conduct excavation at same time Provide temporary access when necessary	MDS / Contractor
2.15	Ground disturbance could damage archaeological and historical remains	Permanent	Major	• Request state and local archaeological authorities to assess archaeological potential of the site • Select alternatives if site has medium – high potential • Include state and town historical authorities as subproject stakeholders to benefit from their expertise	MDS/LGED
2.16	Plantation along the road side	Permanent	Major	• Plantation at the toe of the road along the road using local tree species	Contractor
2.17	Quality of life	Permanent	Major	• Quality of life will improve if the road is maintained on regular basis by LGED	PIU/ PMO (LGED)
2.18	Workers health and safety at risk when	Temporary	Minor	• Coordinate with police – provide warning signs/	PIU/ PMO

Sl. No	Potential Environmental Issues	Duration/ Extent	Magnitude	Mitigation Measures & Method	Responsibility
	conducting road repairs			diversions • Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances • Ensure that all site personnel have a basic level of H&S training. • Provide medical insurance coverage for workers.	(LGED)
2.19	HIV/AIDs Awareness	Temporary	Major	• The Contractor through the PIU will link with state health programs on HIV/AIDS and other communicable diseases awareness. All the construction labours will be provided orientation for awareness on HIV/AIDs and other sexually transmitted diseases at the time of deployment.	MDS/Contractor
2.20	Environmental conditions	Permanent	Major	• Environmental conditions will improve if the road and trees are maintained on regular basis by LGED	PIU/ PMO (LGED)
3.	**Pre-construction activities by contractor**				
3.1	Construction site – Location, Selection, Design and Layout	Temporary	Moderate	• Construction site layout will be submitted by the Contractor no later than30 days from the start of construction for approval of the PS. The layout will illustrate the location of sanitation facilities, storage areas, gates, temporary lodging, water supply, diesel gen set, canteen, first aid, health care and day crèche facilities among others.	LGED/MDS/ Contractor
3.2	Drinking water availability and water arrangement	Temporary	Severe	• The Contractor will be responsible for the arrangement of water in every workplace at suitable and easily accessible place for the whole construction period. Sufficient supply of potable water is to be provided and maintained. If the drinking water is obtained from an intermittent public water supply then, storage tanks will be provided. • Monitoring water quality according to the environmental management plan.	LGED/ Contractor
3.3	Identification of disposal sites	Permanent	Major	• Location of disposal sites will be finalized in consultation with local authority and confirm that: disposal of the material DoEs not impact the natural	LGED/ Contractor

Sl. No	Potential Environmental Issues	Duration/ Extent	Magnitude	Mitigation Measures & Method	Responsibility
				drainage courses or surface water bodies or low lying areas and that no endangered / rare flora is impacted by such materials	
3.4	Site clearance activities including delineation of construction areas	Temporary	Moderate	• Commencements of site clearance activities shall be undertaken after obtaining necessary permissions from PS to minimize environmental impacts. The area utilized for construction and camp activities shall be restored to their former conditions after project completion.	PIU/Contractor PIC/TSC
4.	**Operations and Maintenance stage**				
4.1	Quality of life	Permanent	Major	• Quality of life will improve if the road is maintained on regular basis by LGED	PIU/ PMO (LGED)
4.2	Water quality	Temporary	Minor	• Take all precautions to prevent run-off into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along drainage leading to the water bodies. • Remove all debris/sediments immediately. • Dispose debris/sediments at a designated site such as landfill	PIU/ PMO (LGED)
4.3	Air quality	Temporary	Minor	• Use tarpaulins to cover soils, sand and other loose material.	PIU/Contractor PIC/TSC
4.4	Worker safety at risk when conducting road repairs/improvement	Temporary	Minor	• Coordinate with police-provide warning signs/diversions • Produce and implement a O&M health and safety (H&S) plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflector zed vests, footwear, gloves, goggles and masks) at all times; (iii) providing (H&S) training for all site personnel; (iv) documenting	PIU/ PMO (LGED)
4.5	Environmental conditions	Permanent	Major	• Environmental conditions will improve if the road and trees are maintained on regular basis by LGED	PIU/ PMO (LGED)

F. Cumulative Impact Assessment

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

(i) of any potential residual project effects that may occur incrementally over time;
(ii) consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the project;
(iii) potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed subproject; and
(iv) future developments that are reasonably foreseeable and sufficiently certain to proceed.

94. The project has identified the valued components as air quality, acoustic environment, socioeconomic and socio-community components, and human health and safety. There are no foreseeable projects that will overlap with the subproject. The spatial boundary of the subproject is the area along the corridor of impact (alignment and width of the roads and RoWs) and the temporal boundary can be considered as the whole Shahjadpur Pourashava.

95. It is recommended that infrastructures be (i) designed to the current best practice standard and notified Government of Bangladesh codes; (ii) built that the floods do not damage them; and (iii) side drains are to be kept free from wastes and siltation. Short-term negative impacts are the same with or without climate change measures except that with climate change measures there are increased demand for construction materials and more time to complete the works. No negative cumulative impact and the potential long-term environmental impacts are positive; including mainstreaming climate risk reduction into infrastructure development ensures subprojects infrastructure are less vulnerable to floods, storm surge, landslides and impacts of other extreme weather events.

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

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

98. **Socioeconomic and socio-community:** Concerns on existing provisions for pedestrians and other forms of transport will occur spatially during construction and O&M activities. Traffic movement along the roads, drains will be improved once the activities are completed. Since the subproject will be improved, it will not conflict with existing or planned land use. However, following improvement in infrastructures and services, added residential developments, commercial, and business facilities and increased densities are expected to

develop and enhance Shahjadpur Pourashava. This can be considered a long-term cumulative benefit of the subproject.

99. Given the scale of the project it is likely that local people will obtain at least temporary socio-economic benefits, by gaining employment in the construction workforce, and thus raising their levels of income. These benefits can bring wider social gains if they are directed at vulnerable groups.

100. Upon completion of the project, the socio-community will be the major beneficiaries of this subproject. The citizens, businesses, and communities in Shahjadpur Pourashava will be provided with reliable and climate-resilient roads resulting to enhanced safety, cost savings, and economic growth. Benefits for all Shahjadpur Pourashava citizens include: safe travel, reduced congestion, reduced fuel usage, reduced vehicle maintenance costs, job creation and related positive economic impact, and improved quality of life. These are considered a long-term cumulative benefit.

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

102. Therefore the project will benefit the general public by contributing to the long-term improvement of municipal services and community livability in Shahjadpur Pourashava.

VI. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Public Consultation Conducted

103. The public participation process included (i) identifying interested and affected parties (stakeholders); (ii) informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; (iii) creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments, and concerns) with regard to the proposed development; (iv) giving the stakeholders feedback on process findings and recommendations; and (v) ensuring compliance to process requirements with regards to the environmental and related legislation.

104. Public consultations and focus group discussions (FGDs) were conducted by MDS team on **18-May-2016**. The objective of the meetings was to appraise the stakeholders about environmental impacts of the proposed subproject and safeguards to mitigate the same. A questionnaire was designed and environmental information was collected. Key respondents included project-affected persons, who may suffer temporary access disruptions during construction activities, shopkeepers/businessmen from the subproject area, and daily commuters consulted randomly. Issues discussed and feedback received along with details of date, time, location, and list of participants are given in Appendix 6. The environmental concerns and suggestions made by the participants were listed, and discussed, and suggestions accordingly incorporated in the EMP. These include speedy construction works to ensure low impacts to community during road closures and local employment.

B. Future Consultation and Disclosure

105. The Project has already organized consultation training program for all staff working in UGIIP-III, consultants and Pourashava staff on safeguard policies. The aim of the consultation programme was to inform all stakeholders about the importance of the safeguard policies and their implementation at the design construction and operation stage. Field consultations were conducted with local people. Consultations by the PIU supported by the RES and the PMO include the following:

106. Consultation during detailed design:

- Focus-group discussions(FGD)with affected persons and other stakeholders (including women's groups, NGOs and CBOs to hear their views and concerns, were conducted and concerns were addressed in subproject design
- Structured consultation meetings with the institutional stakeholders (government bodies and NGOs) to discuss and approve key aspects of the subproject

107. Consultation during construction:

- Public meetings with affected communities to discuss and plan work programs and allow issues to be raised and addressed once construction has started
- Smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation.

108. Subproject disclosure:

- Public information campaigns (via newspaper, TV and radio) to explain the subproject to the wider city population and prepare them for disruption they may experience once the construction programme is underway;
- Public disclosure meetings at key subproject stages to inform the public of progress

- Formal disclosure of completed subproject reports by making copies available at convenient locations in the study towns, informing the public of their availability, and providing a mechanism through which comments can be made.

109. For the benefit of the community, relevant information from the IEE will be translated in the local language and made available at (i) offices of executing and implementing agencies, (ii) area offices, (iii) consultant teams' offices; and (iv) contractor's campsites. It will be ensured that the hard copies of IEE are kept at places which are conveniently accessible to people, as a means to disclose the document and at the same time creating wider public awareness. An electronic version of the IEE will be placed in the official website of executing and implementing agencies and the ADB website after approval of the IEE by ADB.

110. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of AP's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

VII. GRIEVANCE REDRESS MECHANISM

111. **Common GRM**: A common GRM will be in place for social, environmental, or any other grievances related to the project; the resettlement plans (RPs) and IEEs will follow the GRM described below, which is developed in consultation with key stakeholders. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required.

112. Pourashava-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign. The project implementation unit (PIU) and governance improvement and capacity development consultants (GICDC) will conduct Pourashava-wide awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements, and will work with the PMO and management, design and supervision consultants (MDSC) to help ensure that their grievances are addressed.

113. Affected persons (APs) will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes that have already been installed by project Pourashavas or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaints register in Pourashava offices. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The project management office (PMO) safeguard officer will have the overall responsibility for timely grievance redress on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party through the PIU designated safeguard focal person.

114. **Grievance redress process:** In case of grievances that are immediate and urgent in the perception of the complainant, the contractor and MDSC on-site personnel will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned PIU safeguard focal person and contractors, will be posted at all construction sites at visible locations.

a. **1st Level Grievance:** The phone number of the PIU office should be made available at the construction site signboards. The contractors and PIU safeguard focal person can immediately resolve on-site in consultation with each other, and will be required to do so within 7 days of receipt of a complaint/grievance.

b. **2nd Level Grievance:** All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the grievance redress cell (GRC) headed by Panel Mayor of the Pourashava with support from PIU designated safeguard focal person and MDSC regional environment and resettlement specialists. GRC will attempt to resolve them within 15 days. The PIU designated safeguard focal person will be responsible to see through the process of redress of each grievance.

c. **3rd Level Grievance:** The PIU designated safeguard focal person will refer any unresolved or major issues to the PMO safeguard officer and MDSC national environmental and resettlement specialists. The PMO in consultation with these officers/specialists will resolve them within 30 days.

115. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

116. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Bangladesh Resident Mission (BRM). The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the project GRM.

117. **Recordkeeping:** Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were effected and final outcome will be kept by PIU. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMO office, Pourashava office, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

118. **Periodic review and documentation of lessons learned:** The PMO safeguard officer will periodically review the functioning of the GRM in each Pourashava and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

119. **Costs:** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at Pourashava-level; while costs related to escalated grievances will be met by the PMO.

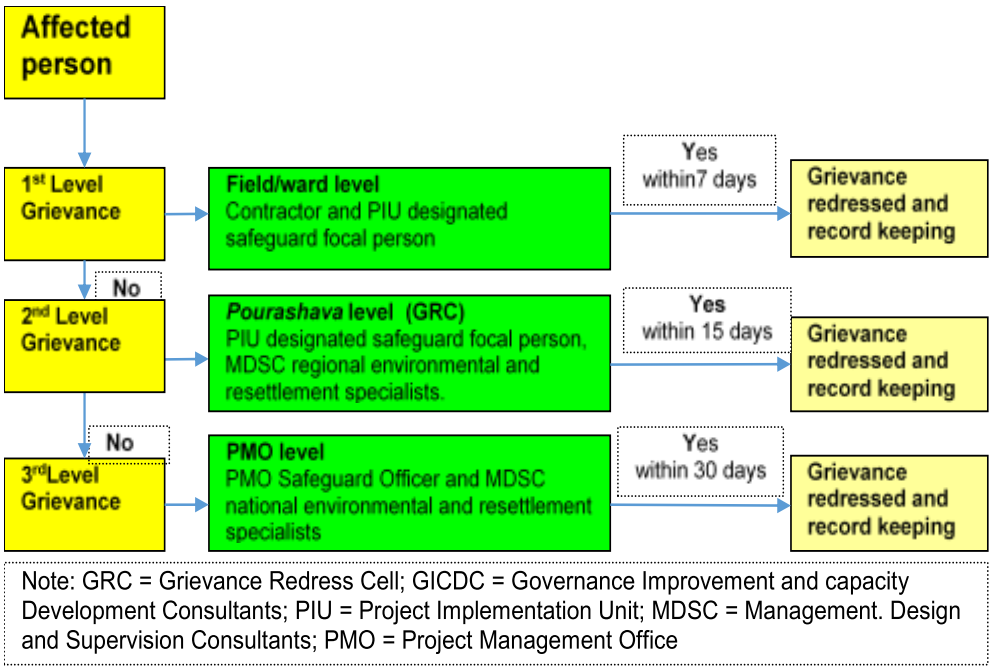

Figure 10: Project Grievance Redress Mechanism

VIII. ENVIRONMENTAL MANAGEMENT PLAN (EMP), SHAHJADPUR POURASHAVA

120. 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.

121. 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.

122. For civil works, 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 the employer 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. Institutional Arrangement

123. **Executing and implementing agencies:** The Local Government Engineering Department (LGED) and the Department of Public Health Engineering (DPHE), both under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban and water supply projects financed by ADB, are the executing agencies of the project. The participating Pourashavas are the implementing agencies.

B. Safeguard Implementation Arrangement

124. **Project management office:** A PMO has been established for the overall management of the project. The PMO is headed by Project Director (PD) supported by officials including three project managers in charge of (i) municipal infrastructure (excluding water supply and sanitation), (ii) water supply and sanitation, and (iii) governance improvement and capacity development, respectively. the PMO will receive support from national environmental specialist and national resettlement specialist on the MDSC team. Key tasks and responsibilities of the PMO safeguard (environment) officer are as follows:

(i) confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
(ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
(iii) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by project implementation unit (PIU) and contractors;
(iv) establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
(v) facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant;

(vi) supervise and provide guidance to the PIUs to properly carry out the environmental monitoring and assessments as per the EARF;
(vii) review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
(viii) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
(ix) ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public; and
(x) address any grievances brought about through the grievance redress mechanism in a timely manner.

125. **Project implementation unit:** The participating Pourashavas have established PIUs within the Pourashava structure. The PIUs will (i) be responsible for land acquisition; (ii) take necessary action for obtaining rights of way; (iii) plan, implement and monitor public relations activities, gender mainstreaming initiatives and community participation activities at Pourashava level; (iv) disseminate information related to the project to the public and media; (v) ensure compliance with loan covenants concerning safeguards measures; and (vi) facilitate implementation of safeguards plans. The PIUs will each designate a Safeguard Officer and will receive assistance from the assigned MDSC regional environmental specialist to:

(i) update IEEs/EMPs during detailed design stage and prepare new IEEs/EMPs in accordance with the EARF;
(ii) conduct environmental compliance audit of existing facilities as per Item of ADB SPS, 2009;
(iii) include IEEs/EMPs in bidding documents and civil works contracts;
(iv) comply with all government rules and regulations;
(v) take necessary action for obtaining rights of way;
(vi) oversee implementation of EMPs including environmental monitoring by contractors;
(vii) take corrective actions when necessary to ensure no environmental impacts;
(viii) submit monthly environmental monitoring reports to PMO,
(ix) conduct continuous public consultation and awareness;
(x) address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs; and
(xi) organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.

126. **Project Management, Design and Supervision Consultants (MDSC):** MDSC has been engaged to work closely with and advise the PMO, to be involved in project supervision including monitoring during construction phase. The MDSC has one national environmental specialist and three regional environmental specialists as well as one national resettlement specialist and three regional resettlement specialists. The MDSC national environmental specialist will, but not limited to:

(i) work under the general supervision of the team leader and the deputy team leader;
(ii) review the environmental guidelines and requirement of the government of Bangladesh and ADB SPS, 2009, environmental subproject selection guidelines and EARF;
(iii) Guide the implementation of future subprojects;

(iv) provide technical support to the PMO and PIUs including review and update of EARF and guidelines for specific type of subprojects and assist in preparing terms of reference for environmental assessment;
(v) assist and guide the MDSC regional environmental specialists to provide support to environmental management functions including updating subproject IEEs in respect to EMP;
(vi) assist in preparing IEEs and in monitoring impact and mitigation measures associated with subprojects;
(vii) assist PIUs and MDSC regional environmental specialists working in the steps for preparing the EIA/IEE, capacity building and training, preparation of guidelines and procedure and subproject specific guidance;
(viii) provide support and guidance to PIUs in undertaking environmental monitoring
(ix) support PMU in submitting semi-annual environmental monitoring reports to ADB;
(x) facilitate in grievance redress and corrective actions;
(xi) train PIU officials regarding environmental requirement and issues; and
(xii) perform any other task assigned by the team leader, deputy team leader and the project director.

127. The MDSC regional environmental specialists will, but not limited to:

(i) work under the supervision and guidance of the team leader, deputy team leader and MDSC national environmental specialist;
(ii) assist PIUs in preparing and updating IEEs including EMPs in accordance with the EARF, and assist in monitoring impact and mitigation measures associated with subprojects including implementation of EMPs by contractors;
(iii) assist in preparation of IEEs and in the environmental review of subproject consisting of screening at Pourashava level by PIU through a committee formed with municipal mayor as chairman and representatives from DOE, LGED and other relevant district office as members;
(iv) assist PIUs in the steps for preparing EIA/IEE, capacity building and training, preparation of guidelines and procedure and subproject specific guidance;
(v) support PIU in environmental monitoring and submit monitoring reports to PMU as inputs into the semi-annual monitoring report submitted to ADB;
(vi) undertake mitigation measures and other specific measures in the construction contract;
(vii) facilitate in grievance redress and corrective actions;
(viii) follow subproject selection guidelines and EARF to ensure compliance with the environmental guidelines and requirement of the Government of Bangladesh and ADB SPS, 2009;
(ix) support PMO and MDSC national environment specialist by providing data, information and all other requested assistance;
(x) train PIU officials regarding environmental issues
(xi) perform any other task assigned by MDSC national environment specialist, team leader, deputy team leader and the project director.

128. **Civil works contracts and contractors:** EMPs are to be included in bidding and contract documents and verified by the PIUs and PMO. The contractor will be required to designate an environmental supervisor to (i) coordinate with MDSC on updating the IEE/EMP based on detailed designs, and (ii) ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract table 10.

129. **Governance Improvement and Capacity Development Consultants (GICDC):** The PMO and PIUs will require support on a range of activities related to governance improvement and capacity development of Pourashavas. The GICDC will support PMO and

PIUs in implementing urban government improvement action plan (UGIAP) by providing capacity development, community mobilization and other facilitation services. There are 4 GICDC regional offices consisting of 4 regional coordinators at each regional office. There are 2 Local Capacity Development Associates (Community Mobilization and Municipal Finance) in each project Pourashava. The regional coordinators are assisting the Pourashavas and the LCDAs in the activities related to community participation and financial development. The LCDAs have been posted at the Pourashava and (i) are working maintaining close liaison with the mayor, councilors, Pourashava staffs and communities, (ii) providing assistance and support to PIU regarding planning and implementation of citizen awareness and participation activities, urban planning, equity and inclusiveness of women and urban poor. The GICDC also have a training specialist who is responsible for identifying and coordinating capacity building activities at Pourashava level Figure 13.

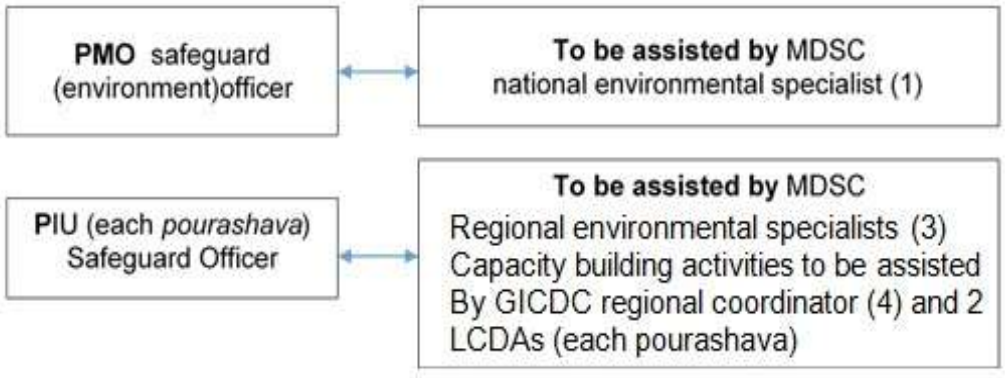

Figure 11 : Safeguards Implementation Arrangement

Table 10: Environment al Management and Monitoring Plan – Prior, During, and Post Construction Phase

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
1. Prior to Construction Activities						
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	• 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	Project management unit (PMO), project implementing unit (PIU), Management Design Supervision Consultants (MDSC)	• Incorporated in final design and communicated to contractors.	• Prior to award of contract	• No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PMO and PIU. • Mitigation measures are included as part of TOR of PMO, PIU, MDSC
Updating of IEE based on detailed design	Site-specific impacts not identified, mitigation measures not appropriate and sufficient to address impacts	• Update IEE and EMP based on detailed design • Ensure updated EMP is provided to contractors • Relevant information disclosed	PMO	• Updated IEE and EMP reviewed, approved and disclosed	• Upon completion of detailed design	• No additional cost required
Existing utilities	Disruption of services.	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction activities • Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Require contractors to prepare spoils management plan (see Appendix 8 for	PMO, PIU, MDSC, Contractors	• List of affected utilities and operators; • Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24	• During detailed design phase • Review of spoils management plan: Twice (once after first draft and once before final	• No cost required. • Mitigation measures are included as part of TOR of PMO, PIU, MDSC. And in contract documents.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		outline) and traffic management plan (see Appendix 5 for sample)		hours), spoil management plan (see Appendix 8 for outline), and traffic management plan (see Appendix 5 for sample)	approval)	
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	• Determine locations prior to award of construction contracts.	PMO, PIU, and MDSC	• List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas. • Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	• During detailed design phase	• No cost required. • Mitigation measures are included as part of TOR of PMO, PIU, and MDSC.
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	• Prepare list of approved quarry sites and sources of materials	PMO, PIU, and MDSC	• List of approved quarry sites and sources of materials; • Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	• During detailed design phase, as necessary with discussion with detailed design engineers and PIUs	• No cost required. • Mitigation measures are included as part of TOR of PMO, PIU, and MDSC.
EMP Implementation	Irreversible impact to the	• Project manager and all key workers will be required to undergo EMP implementation	Construction Contractor	• Proof of completion	• During detailed design	• Cost of EMP Implementation

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
Training	environment, workers, and community	including spoils management, Standard operating procedures (SOP) for construction works; health and safety (H&S), core labor laws, applicable environmental laws, etc		(Safeguards Compliance Orientation) • Posting of proof of completion at worksites • Posting of EMP at worksites	phase prior to mobilization of workers to site	Orientation Training to contractor is the responsibility of PMO and PIU. • Other costs responsibility of contractor.
2. During Construction Activities						
A. Physical Characteristics						
Topography, landforms, geology and soils	Significant amount of gravel, sand, and cement will be required for this subproject. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, ensure these conform to all relevant regulatory requirements. • Borrow areas and quarries (If these are being opened up exclusively for the subproject) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.	Construction Contractor	• Records of sources of materials	• Monthly by PIU	• Cost for implementation of mitigation measures responsibility of contractor.
Water quality	Trenching and excavation, run-off from	• Prepare and implement a spoils management plan (see Appendix 8 for outline).	Construction Contractor	• Areas for stockpiles, storage of fuels and	• Visual inspection by PIU and	• Cost for implementation of mitigation

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	stockpiled materials, and chemical contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause siltation and reduction in the quality of adjacent bodies of water. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Prioritize re-use of excess spoils and materials in construction activities. If spoils will be disposed, consult with Shahjadpur local authority on designated disposal areas. • All earthworks must be conducted during dry season to the maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. • Location for stockyards for construction materials shall be identified at least 300m away from watercourses. Place storage areas for fuels and lubricants away from any drainage leading to water bodies. • Take all precautions to minimize the wastage of water in the construction activities. • Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies. • Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas. • While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse and cross drainage channels. • Monitor water quality according to the environmental management plan.		lubricants and waste materials; • Number of silt traps installed along trenches leading to water bodies; • Records of surface water quality inspection; • Effectiveness of water management measures; • No visible degradation to nearby drainages, *khals* or water bodies due to construction activities	supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	measures responsibility of contractor.
Air quality	Conducting works at dry season and moving large	• Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary during dry weather;	Construction Contractor	• Location of stockpiles; • Number of	• Visual inspection by PIU and	• Cost for implementation of mitigation

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Use tarpaulins to cover soils, sand and other loose material when transported by trucks. • Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free. • Arrangements to control dust through provision of windscreens, water sprinklers, and dust extraction systems shall be provided at all hot-mix plants, batching plants and crushers (if these establishments are being set up exclusively for the subproject). • Monitor air quality.		complaints from sensitive receptors; • Heavy equipment and machinery with air pollution control devices; • Certification that vehicles are compliant with air quality standards.	supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	measures responsibility of contractor.
Acoustic environment	Construction activities will be on settlements, along and near schools, and areas with small-scale businesses. Temporary increase in noise level and	• Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. • Plan activities in consultation with Shahjadpur local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.	Construction Contractor	• Number of complaints from sensitive receptors; • Use of silencers in noise-producing equipment and sound barriers; • Equivalent day and night time noise	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	vibrations may be caused by excavation equipment, and the transportation of equipment, materials, and people. However, the proposed subproject will follow existing ROW alignment and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Use of high noise generating equipment shall be stopped during night time. • Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; • Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufacturers' specifications at all times. • All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required). • Monitor noise levels. Maintain maximum sound levels not exceeding 85 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. • If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Workers in a posted noise hazard area must wear hearing protection. • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.		levels	detailed design stage and final location of subproject components	
Aesthetics	The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess	• Prepare the Debris Disposal Plan • Remove all construction and demolition wastes on a daily basis. • Coordinate with Shahjadpur local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas Avoid stockpiling of any excess spoils • Suitably dispose of collected materials	Construction Contractor	• Number of complaints from sensitive receptors; • Worksite clear of hazardous wastes such as oil/fuel • Worksite clear of any wastes,	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	from drainages, unutilized materials and debris either through filling up of pits/wasteland or at pre-designated disposal locations. • All vehicles delivering fine materials to the site and carrying waste debris for disposal shall be covered to avoid spillage of materials. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. • Lighting on construction sites shall be pointed downwards and away from oncoming traffic and nearby houses. • In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction. • The site must be kept clean to minimize the visual impact of the site. Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;		collected materials from drainages, unutilized materials and debris • Transport route and worksite cleared of any dust/mud	sites to be finalized during detailed design stage and final location of) subproject components	
B. Biological Characteristics						
Biodiversity	Activities being located in the built-up area of Shahjadpur pourashava. There are no protected areas in or around subproject sites,	• Check if tree-cutting will be required during detailed design stage. No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment management specialist. • If during detailed design cutting of trees will be required, compensatory plantation for trees lost at a rate of 2 trees for every tree	Construction Contractor	• PMO and PIU to report in writing the number of trees cut and planted if tree-cutting will be required (to be determined during detailed design stage)	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	and no known areas of ecological interest. There are no trees at the site that need to be removed.	cut, in addition to tree plantation as specified in the design, will be implemented by the contractor, who will also maintain the saplings for the duration of his contract. • All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees. • Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body in the subproject vicinity. • Prohibit employees from poaching wildlife and cutting of trees for firewood.		• Number of complaints from sensitive receptors on disturbance of vegetation, poaching, fishing, etc.	finalized during detailed design stage and final location of) subproject components	
C. Socioeconomic Characteristics						
Existing provisions for pedestrians and other forms of transport	Road closure is not anticipated. Hauling of construction materials and operation of equipment on-site can cause traffic problems. However, the proposed subproject will follow existing ROW alignment. The impacts are negative but short-term, site-	• Prepare and implement a Traffic Management Plan (see Appendix 5 for sample) • Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Maintain safe passage for vehicles and pedestrians throughout the construction period. • Schedule truck deliveries of construction materials during periods of low traffic volume. • Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required. • Notify affected sensitive receptors by	Construction Contractor	• Traffic route during construction works including number of permanent sign ages, barricades and flagmen on worksite as per Traffic Management Plan (see Appendix 5 for sample); • Number of complaints from sensitive receptors; • Number of sign ages placed at project location	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	specific within a relatively small area and reversible by mitigation measures.	providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints. • Leave spaces for access between mounds of soil. • Provide walkways and metal sheets where required to maintain access across for people and vehicles. • Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools. • Consult businesses and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and institutions during construction activities, so that there is no closure of these shops or any loss of clientage. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.		• Number of walkways, sign ages, and metal sheets placed at project location		
Socio-economic status	Subproject components will be located in government land and existing ROWs thus there is no requirement for land acquisition or any resettlements. Manpower will be required during the construction stage. This can	• Employ at least 50% of labor force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problems from workers housed in poorly serviced camp accommodation. • Secure construction materials from local market.	Construction Contractor	• Employment records; • Records of sources of materials • Records of compliance to Bangladesh Labor Law of 2006 and other applicable standards	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term.				components	
Other existing amenities for community welfare	Although construction of subproject components involves quite simple techniques of civil work, the invasive nature of excavation and the subproject sites being in built-up areas of Shahjadpur Pourashava where there are a variety of human activities, will result to impacts to the sensitive receptors such as residents, businesses, and the community in general. Excavation may also damage existing	• Provide safety signage at all sites visible to public • Provide safety barriers near any trenches, and cover trenches with planks during non work hours. • Obtain details from Pourashava nature and location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible; • Integrate construction of the various infrastructure subprojects to be conducted in Shahjadpur (roads and drains etc.) so that different infrastructure is located on opposite sides of the road where feasible and roads and inhabitants are not subjected to repeated disturbance by construction in the same area at different times for different purposes. • Consult with local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. • Existing infrastructure (such as water distribution pipes, electricity pylons, etc.) shall be relocated before construction starts at the subproject sites. • Prior permission shall be obtained from	Construction Contractor	• Utilities Contingency Plan Number of complaints from sensitive receptors	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	infrastructure (such as water distribution pipes, electricity pylons, etc) located alongside the roads. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users. • If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to start of construction. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.				
Community health and safety	Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. Poor safety signage and lack of barriers at work site and trenches will create hazard to pedestrians	• Provide safety signage at all sites visible to public • Provide safety barriers near any trenches, and cover trenches with planks during non work hours. • Contractor's activities and movement of staff will be restricted to designated construction areas. • Locations of hot-mix plants, batching plants and crushers (if these establishments are being set up exclusively for the subproject) shall be located at least 100 m away from the nearest dwelling preferably in the downwind direction. • Consult with Shahjadpur local authority on the designated areas for stockpiling of, soils, gravel, and other construction materials. • If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment	Construction Contractor	• Number of permanent signages, barricades and flagmen on worksite as per Traffic Management Plan (see Appendix 5 for sample); • Number of complaints from sensitive receptors; • Number of walkways, signages, and metal sheets placed at project location • Agreement between landowner and contractors in	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	and children.	management specialist and landowner. • Use small mechanical excavators to attain faster trenching progress. For rock and concrete breaking, use non-explosive blasting chemicals, silent rock cracking chemicals, and concrete breaking chemicals.[1] • Under no circumstances may open areas or the surrounding bushes be used as a toilet facility. • Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged. • A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facility); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do. • Interested and affected parties need to be made aware of the existence of the complaints book and the methods of		case of using private lands as work camps, storage areas, etc.		

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the national/regional environmental specialist's attention immediately; and (iv) taking remedial action as per national/regional environment specialist's instruction. • The contractor shall immediately take the necessary remedial action on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the national/regional environmental specialist within 48 hours of receipt of such complaint/grievance.				
Workers health and safety	There is invariably a safety risk when construction works such as excavation and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are	• Comply with requirements of Government of Bangladesh Labor Law of 2006 and all applicable laws and standards on workers H&S. • Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behavior that are unclear. • Produce and implement a site health and safety (H&S) plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles	Construction Contractor	• Site-specific H&S Plan • Equipped first-aid stations • Medical insurance coverage for workers • Number of accidents • Records of supply of uncontaminated water • Condition of eating areas of workers • Record of H&S orientation trainings	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	negative and long-term but reversible by mitigation measures.	and masks) at all times; (iii) providing (H&S) training[2] for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. • Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances • Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; and (iii) sanitation facilities are available at all times. • Provide medical insurance coverage for workers; • Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • 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;		• Use of personal protective equipment • Permanent sign boards for hazardous areas • Signage's for storage and disposal areas • Condition of sanitation facilities for workers		

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		• Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, 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; and • 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.				
D. Historical, Cultural, and Archaeological Characteristics						
Physical and cultural heritage	Construction works will be on existing roads and in built-up areas of Shahjadpur thus risk for chance finds is low.	• All fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest discovered on the site shall be the property of the government. • Prevent workers or any other persons from removing and damaging any fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest. • Stop work immediately to allow further investigation if any finds are suspected.	Construction Contractor	• Records of chance finds	• Visual inspection by PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of) subproject components	• Cost for implementation of mitigation measures responsibility of contractor.
E. Others						
Submission of EMP implementation report	Unsatisfactory compliance to EMP	• Appointment of supervisor to ensure EMP implementation • Timely submission of monitoring reports including pictures	Construction contractor	• Availability and competency of appointed supervisor • Monthly report	• Monthly monitoring report to be submitted by PIU to PMO	• Cost for implementation of mitigation measures responsibility of

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
					• PMO to submit semi-annual monitoring report to ADB	contractor.
3. Post-construction Activities						
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	• Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and • All excavated roads shall be reinstated to original condition. • All disrupted utilities restored • All affected structures rehabilitated/compensated • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. • All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regressed using the guidelines set out in the revegetation specification that forms part of this document. • The contractor must arrange the cancellation of all temporary services. • Request PMO/CSS to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	Construction Contractor	• PMO/CSS report in writing that (i) worksite is restored to original conditions; (ii) camp has been vacated and restored to pre-project conditions; (iii) all construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.	• Prior to turn-over of completed works to Pourashava	• Cost for implementation of mitigation measures responsibility of contractor.

Table 11: Environmental Management and Monitoring Plan – O&M Phase

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
A. Physical Characteristics						
Water quality	Run-off from debris/sediments from repair and maintenance of road and bridge which may cause siltation and reduction in the quality of adjacent bodies of water. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Take all precautions to prevent run-off into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along drainage leading to the water bodies. • Remove all debris/ sediments immediately. • Dispose debris/sediments at a designated site such as landfill.	Shahjadpur Pourashava	• No visible degradation to nearby drainages, *khals* or water bodies due to construction activities	Duration of repair works	Included in O&M cost
Air quality	Moving debris/sediments may create dusts during dry season. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Use tarpaulins to cover soils, sand and other loose material.	Shahjadpur Pourashava	• No of complaints from sensitive receptors	Duration of repair works	Included in O&M cost
Acoustic environment	Temporary increase in noise level and vibrations. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Plan activities in consultation with Shahjadpur local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.	Shahjadpur Pourashava	• No complaints from sensitive receptors	Duration of repair works	Included in O&M cost
B. Biological Characteristics						

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
Biodiversity	Activities in the built-up area of Shahjadpur Pourashava. There are no protected areas in or around subproject sites, and no known areas of ecological interest.	• No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal).	Shahjadpur Pourashava	• No of complaints from sensitive receptors	Duration of repair works	Included in O&M cost
C. Socioeconomic Characteristics						
Existing provisions for pedestrians and other forms of transport	Road closure is not anticipated. Traffic may be interrupted temporarily. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	• Maintain safe passage for vehicles and pedestrians during maintenance activities. • Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required. • Notify affected sensitive receptors by providing sign boards informing nature and duration of maintenance activities and contact numbers for concerns/complaints. • Leave spaces for access between mounds of soil. • Provide walkways and metal sheets where required to maintain access across for people and vehicles. • Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools.	Shahjadpur Pourashava	• No of complaints from sensitive receptors	Duration of repair works	Included in O&M cost

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		• Consult businesses and institutions regarding operating hours and factoring this in work schedules. • Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.				
Workers health and safety	Workers need to be mindful of the occupational hazards working in confined spaces such as closed drains. Potential impacts are negative and long-term but reversible by mitigation measures.	• Comply with requirements of Government of Bangladesh Labor Law of 2006 and all applicable laws and standards on workers H&S. • Ensure that all site personnel have a basic level of H&S training. • Produce and implement a O&M H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing H&S training for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. • Arrange for readily available first aid unit including an adequate supply of sterilized	Shahjadpur Pourashava	• No of complaints from sensitive receptors • No of complaints from workers related to O&M activities • Zero accident	Duration of repair works	Included in O&M cost

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		dressing materials and appliances ● Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; ● Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; ● Mark and provide sign boards. 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. ● 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.				
D. Historical, Cultural, and Archaeological Characteristics						
Physical and cultural heritage	Construction works will be on existing roads and in built-up areas of Shahjadpur thus risk for chance finds is low.	● All fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest discovered on the site shall be the property of the government.	Shahjadpur Pourashava	● Records of chance finds	Duration of repair works	Included in O&M cost

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		• Prevent workers or any other persons from removing and damaging any fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest. • Stop work immediately to allow further investigation if any finds are suspected.				

C. Institutional Capacity Development Program

130. The MDSC national and regional environmental specialists are responsible for trainings on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project along with the frequency of sessions is presented in Table 12.

Table 12: Training Program for Environmental Management

Items	Pre-construction/prior to construction	Construction	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staffs	Experiences and best practices sharing
Purpose	To aware the participants of the environmental safeguard requirements of ADB and GOB and how the project will meet these requirements	To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GOB	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	**Module 1: Orientation** • ADB Safeguards Policy Statement • Government of Bangladesh Environmental Laws and Regulations **Module 2: Environmental Assessment Process** • ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements • Review of environmental assessment report to comply with ADB requirements • Incorporation of EMP into the project design and contracts	• Roles and responsibilities of officials/contractors/consultants towards protection of environment • Environmental issues during construction • Implementation of EMP • Monitoring of EMP implementation • Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, PIUs, and PMSC
Participants	LGED, DPHE, PMO, and PMO staffs (technical and environmental) involved in the project implementation	PMO/ PIUs Contractors	PMO / PIUs Contractors

D. Staffing Requirement and Budget

131. Costs required for implementing the EMP will cover the following activities:

(i) Updating IEE, preparing and submitting reports and public consultation and disclosure;
(ii) Application for environmental clearances; and
(iii) Implementation of EMP, environmental monitoring program and long-term surveys.

132. The infrastructure involved in each scheme is generally straightforward and will take between three and nine months to build. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by MDSC environmental management specialist assisted by the PMO environment officer. The environmental management specialist will use the IEE as necessary and perform tasks as specified in the TOR. Therefore no separate budget required for MDSC environment management specialist.

133. The cost of mitigation measures and surveys during construction stage will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors.

134. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of Shahjadpur Pourashava. All monitoring during the operation and maintenance phase will be conducted by LGED and DPHE, therefore, there are no additional costs. The indicative costs of EMP implementation are shown in Tables 13 and 14 (by source of funds).

Table 13: Indicative Cost of EMP Implementation

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
A.	Mitigation Measures						
1.	Compensatory plantation measures	Construction	Per tree				Civil works contract
B.	Monitoring Measures						
1.	Air quality monitoring	- Pre-construction - Construction	Per location	2	30,000	60,000	Civil works contract
2.	Noise levels monitoring	- Pre-construction - Construction	Per location	20	10,000	200,000	Civil works contract
C	Capacity Building						
1.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, Government of Bangladesh environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation; and (iii) lessons learned information sharing	Module 1 – immediately upon engagement of the MDSC environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 – prior to start of Phase 2 and upon completion of the project	lump sum		Module 1 – 150000 Module 2 – 150000 Module 3 – 150000	450,000	Covered under MDSC contract
D.	Consultants Costs						
1.	MDSC national environmental specialist (1 person)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	40 person months	225000 per person month	90,00000	Remuneration and budget for travel covered in the MDSC contract
2.	MDSC regional environmental specialists (3 persons)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	40 each = 120 person-months	152,000 per person-month	18,240,000	Remuneration and budget for travel covered in the MDSC contract
E.	Administrative Costs						
1.	Legislation, permits, and agreements	Permit for excavation, tree-cutting	Lump sum		50,000	50,000	These consents

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
		permits, etc					are to be obtained by contractor at his own expense.
		Environmental assessment and environmental clearances as per ECA and ECR requirements Obtaining right of way clearances with related national agencies.	Lump sum		100,000	100,000	Pourashava cost for municipal infrastructures
F.	Other Costs						
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum		300,000	Covered under MDSC contract
2.	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)		Lump sum		450,000	PMO/PIU cost
3.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period		Lump sum	Contractor's liability	As per insurance requirement	Civil works contract – contractor's insurance

Table 14 : Indicative Cost of EMP Implementation – Per Source of Funding

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
A. Contractors							
1.	Compensatory plantation measures	Construction	Per tree				Civil works contract
2.	Air quality monitoring	- Pre-construction - Construction	Per location	2	30,000	60,000	Civil works contract
3.	Noise levels monitoring	- Pre-construction - Construction	Per location	20	10,000	200,000	Civil works contract
4.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc	Lump sum		50,000	50,000	These consents are to be obtained by contractor at his own expense.
5.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period		Lump sum	Contractor's liability	As per insurance requirement	Civil works contract – contractor's insurance
	Subtotal					310,000	
B. MDSC							
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum		300,000	Covered under MDSC contract
2.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, Government of Bangladesh environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected	Module 1 – immediately upon engagement of the MDSC environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 – prior to start of Phase 2 and upon completion of the project	lump sum		Module 1 – 150,000 Module 2 – 150,000 Module 3 – 150,000	450,000	Covered under MDSC contract

	Particulars	Stages	Unit	Total Number	Rate (Taka)	Cost (Taka)	Cost covered by
	adverse impacts or ineffective mitigation measures found during the course of implementation; and (iii) lessons learned information sharing						
3.	MDSC national environmental specialist (1 person)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	40 person months	225,000 per person month	90,00000	Remuneration and budget for travel covered in the MDSC contract
4.	MDSC regional environmental specialists (3 persons)	Responsible for environmental safeguards of the project	person months (spread over entire project implementation period)	40 each = 120 person-months	152000 per person-month	18,240,000	Remuneration and budget for travel covered in the MDSC contract
	Subtotal					27,990,000	
C. Administrative Cost (Recurring) – PMO							
1.	Legislation, permits, and agreements	Environmental assessment and environmental clearances as per ECA and ECR requirements Obtaining right of way clearances with related national agencies.	Lump sum		100,000	100,000	Pourashava cost for municipal infrastructures
2.	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)		Lump sum		1,000,000	PMO/PIU cost
	Subtotal					1,100,000	

IX. MONITORING AND REPORTING

135. PMO will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts, and will be identified in the EIAs/IEEs for the projects. In addition to recording information on the work and deviation of work components from original scope PMO, PIUs, and MDSC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome. Corrective actions to be taken quickly and reported in monitoring reports.

136. MDSC will submit monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO will submit semi-annual monitoring reports to ADB. Subproject budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

137. LGED and DPHE will document monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan, and for each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by ADB.

138. ADB will review project performance against the commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic site visits for projects with adverse environmental or social impacts;
(ii) conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
(iv) work with EAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate; and
(v) (v)prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

X. FINDINGS, RECOMMENDATIONS AND CONCLUTIONS

139. The environmental status of the proposed road and drain improvement/rehabilitation has been assessed. Issues related to involuntary resettlement were assessed and will be reported in the Social Sector Assessment for the subprojects.

A. Findings

140. The Shahjadpur Pourashava roads and drains improvement subprojects are designed to improve the quality of life of residents and to enhance the town's role as a market, services, and manufacturing centre. Moreover, urban residents and the rural residents in surrounding hinterland will benefit from improved roads allowing better access to urban markets and social services provided in the Project towns. The town economy will benefit from enhanced productivity as a result of health improvement, time savings in as well as from increased urban efficiency arising from improved roads.

141. During subproject design, community meetings were held with beneficiaries to discuss sanitation, poverty, resettlement, affordability issues, and environmental concerns. Socioeconomic surveys obtained information and individual views on current situations and future preferences.

142. The process described in this document has assessed the environmental impacts of the proposed road improvements. Potential negative impacts could not be identified in construction and operation of the improved infrastructure, and no impacts were identified as being due to either design or location. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed with specialists responsible for the engineering aspects, and as a result some measures have already been included in the outline designs and contract documents for the infrastructure. These include locating all the facilities within the ROW of existing roads, to avoid the need to acquire land / new ROW or relocation of people.

143. There were limited opportunities to provide environmental enhancements, but certain measures were included. For example it is proposed that the subproject:

- Employ in the workforce people who live in the vicinity of the construction site to provide them with a short-term economic gain; and
- Plant large-growing trees at the periphery of the site by the contractor to mask it from view and give it a more natural and pleasing appearance.

144. These and the other mitigation and enhancement measures are summarized and shows the location of the impact, the body responsible for the mitigation, and the program for its implementation.

145. The improved roads will provide a more efficient and effective transport route, which should improve the overall economy by reducing time spent idle in traffic by delivery vehicles, employees and customers.

146. The effectiveness of each mitigation measure in reducing each impact to an acceptable level. This is shown as the level of significance of the residual impact (remaining after the mitigation is applied). This shows that all impacts will be rendered at least neutral (successfully mitigated), and that certain measures will produce a benefit (in addition to the major benefits provided by the operating schemes).

147. Mitigation will be assured by a program of environmental monitoring conducted during both construction and operation to ensure that all measures are provided as intended, and to determine whether the environment is protected as envisaged. This will include observations on and off site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported to the PMO.

B. Recommendations

148. Two straight recommendations need to be followed to ensure that the environmental impacts of the subproject are successfully mitigated. These are that LGED should ensure:

- All mitigation, compensation and enhancement measures proposed in this IEE report and in the Resettlement Framework for the LGED are implemented in full, as described in these two documents;

C. Conclusions

149. The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of location, design, construction or operation of the subproject. There should in fact be some benefits from recommended mitigation and enhancement measures, and major improvements in quality of life individual and public health once the subproject is in operation.

150. All required issues have been assessed to the best of our knowledge and no further studies are required to comply with ADB procedures or the laws of GoB.

Appendix-1 View on Photographs

PHOTOGRAPH OF SHAHJADPUR POURASHAVA ROADS AND DRAINS

Appendix-2 Environment Clearance Certificate

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: DOE/Clearance/5444/2015/187 Date:02/05/2016

Subject: Environmental Clearance for Third Urban Governance and Infrastructure Improvement (Sector) Project (UGIIP-III)

Ref : Your application dated 08/03/2016 and 12/04/2016.

With reference to the above, I have the pleasure to convey the approval of Environmental Clearance for Third Urban Governance and Infrastructure Improvement (Sector) Project (UGIIP-III) at 31 selected Pourashava in Dhaka, Chittagong, Rajshahi, Rangpur, Khulna and Sylhet Divisions.

A copy of the said Environmental Clearance Certificate is attached herewith for your necessary action.

02.05.2016

(Syed Nazmul Ahsan)
Director (Environment Clearance, c.c)
Phone # 02-8181673

Project Director
Third Urban Governance and Infrastructure
Improvement (Sector) Project (UGIIP-III)
Local Government Engineering Department (LGED)
Level-12, LGED Bhaban,Sher-E-Bangla Nagar
Agargaon, Dhaka-1207.

Copy Forwarded to :

1) PS to the Secretary, Ministry of Environment and Forests, Bangladesh Secretariat, Dhaka.
2) Director, Department of Environment, Dhaka/Chittagong Regional Office, Dhaka/Chittagong.
3) Director, Department of Environment, Rajshahi/Khulna/Sylhet Divisional Office, Bogra/Khulna/Sylhet.
4) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

Appendix-3 Rapid Environmental Assessment (REA) Checklist

Rapid Environmental Assessment (REA) Checklist for Screening of Road Sub–Project

➢ This checklist is to be prepared to support the environmental classification of a project. It is to be attached to the environmental categorization form that is to be prepared and submitted to the LEGD / MDS Consultant
➢ This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.
➢ This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
➢ 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.
Name of Pourashava : Shahjadpur

Name of Sector	**:**	**Infrastructure (Road) Improvement.**
Sub-Project /Scheme	**:**	Improvement of road starting from Shahzadpur Dak-Banglow to Dabaria High way via Dabaria Mosque by DBC

Field Survey on Environmental Questionnaire

SCREENING QUESTIONS	Tick Mark		Remarks
	YES	NO	
A. Sub -Project Location :*Weather the project area is adjacent to or within any of the following environmentally sensitive area :*			
1. Cultural heritage site		✓	
2. Protected Area		✓	
3. Wetland		✓	
4. Mangrove		✓	
5. Estuary		✓	
6. Protected Buffer area		✓	
7. Middle of protective areas		✓	
8. Specially protective biodiversity area		✓	
B. Sub -Project Particulars :			
1. Road length < 20 Km.	✓		L= 1795m
2. Road length > 20 Km.		✓	
3. Landslide		✓	
4. Location of Electric poles		✓	
5. Widening of Road Formation.		✓	
6. Repair /Improvement of road.	✓		Improvement of Road by BC
7. Road length within /abutting permanent Wetland.		✓	
8. Road constructed along river or irrigation canal (km).		✓	
9. Road crossing any stream, canal, river.		✓	
10. Increase no. of Road Cross- drainage Structure.	✓		
11. Occurrence record of flood on either side of the Road.		✓	
12. Tree Cutting on the Road alignment		✓	
13. Plantation scope on the Road sides.		✓	

SCREENING QUESTIONS	Tick Mark		Remarks
	YES	NO	
C. Potential Environmental Impacts: *Will the Sub-Project causes ……..*			
1) Any change of landscape due to road construction?		✓	
2) Occupancy the land from any protective areas.		✓	
3) Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams by increased soil erosion due to road construction?	✓		Some problem can arisen during construction period.
4) Surface water contamination from workers' camp and chemicals used in construction site?		✓	
5) Local air pollution due to rock crushing, cutting etc. and chemicals from asphalt processing?		✓	
6) Noise and vibration due to blasting and other civil works?	✓		Proper attention during construction period
7) Road blocking and temporary flooding due to land excavation during the rainy season?		✓	
8) Traffic disturbance due to construction materials transport and wastes?	✓		Temporary problem during construction period
9) Temporary silt runoff due to construction?		✓	
10) Inconveniences in living condition and upper respiratory problems or stress for the people?		✓	
11) Chemical hazardous condition for the proposed road with construction of the existing road?		✓	
12) Poor sanitation and solid waste disposal in construction camp/ site which may transmit communicable diseases from workers to the local populations?	✓		Local labour will be engaged
13) Creation of temporary breeding of mosquitoes?		✓	
14) Dislocation and compulsory resettlement of people living in ROW (right-of-way)?		✓	
15) Noise and air pollution due to increase of traffic volume?	✓		Dust will be suppressed through water spraying
16) Increased risk of water pollution from oil, grease, spills etc from vehicles/ other equipment's during road construction?		✓	
17) Contamination of water due to solid waste disposal during road construction?		✓	
18) Health and safety hazards to workers from toxic gases which may emission from hot mix plant and bitumen?		✓	
19) Chance of spread of water born diseases?		✓	
20) Social conflicts between construction workers from other areas and community workers?	✓		Local labour will be engaged
21) Chance of spread of HIV/ AIDS and STD?		✓	

Rapid Environmental Assessment (REA) Checklist for Screening of Drainage Sub–Project

• This checklist is to be prepared to support the environmental classification of a project. It is to be attached to the environmental categorization form that is to be prepared and submitted to the LEGD / MDS Consultant
• This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.
• 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.

Name of Pourashava : Shahjadpur		
Name of Sector	**:**	**Infrastructure of Drain Improvement**
Sub-Project /Scheme	**:**	Construction of RCC Drain Starting from Monirampur Sobahan shop to Monirampur Darul Ulum Madrasha

Field Survey on Environmental Questionnaire

SCREENING QUESTIONS	Tick Mark		Remarks
	YES	NO	
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?		✓	
Cultural Heritage site		✓	
Protected Area		✓	
Wetland		✓	
Mangrove		✓	
Estuarine		✓	
Buffer zone of protected area		✓	
Special area for protecting biodiversity		✓	
B. Sub -Project Particulars :			
Drain length and with	✓		L= 213 m
Type of drain	✓		U-type drain
Tree cutting on the drainage alignment	✓		
Outfall of drainage?	✓		
Existences of cross drainage. Is it hampering drainage flow?		✓	
C. Potential Environmental Impacts			
Will the Project cause…			
Pollution of the receiving water body		✓	
pollution or interfere with the irrigation canal / channel		✓	
affect the structures near the out fall		✓	
Affect the community structures at the or near by the out fall		✓	
Potential ecological problems due to increased soil erosion and siltation?		✓	
Creation of temporary breeding habitats for mosquito vectors of disease due to water stagnancy in the drains?		✓	
Access problem for the house dwellers	✓		Proper attention during construction period
Impact on commercial and business establishment during construction	✓		Temporary problem during construction period
Impact on livelihood of Hawkers during construction	✓		Temporary problem during construction period

SCREENING QUESTIONS	Tick Mark		Remarks
	YES	NO	
Impact on land due to disposal of sludge from the desolation of the drains		✓	
Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		✓	
Impairment of historical/cultural monuments/areas and loss/damage to these sites		✓	
increased Drain traffic due to interference of construction activities	✓		Popper attention during construction period
Continuing soil erosion/silt runoff from construction operations?		✓	
increased volume of sullage (wastewater from cooking and washing) and sludge		✓	
poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of		✓	
Dislocation or involuntary resettlement of people?		✓	
Potential social conflicts arising from land tenure and land use issues?		✓	
Soil erosion before compaction and lining of canals?		✓	
Labor-related social problems especially if workers from different areas are hired?		✓	
Alteration of surface water hydrology of waterways crossed by Drains, resulting in increased sediment in streams affected by increased soil erosion at construction site?		✓	
Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		✓	
Downstream water pollution from discharge of Fish pond effluents with drain water?		✓	
Soil erosion (furrow, surface)?		✓	
Scouring of canals?		✓	
Logging of canals by sediments?		✓	
Clogging of canals by weeds?		✓	
Pollution from oil and fuel spills and bilge flushing?		✓	

Appendix-4 Levels of Service for Proposed Interventions- Roads

Road part	Existing Standard	Proposed Standard	Additional Climate Change for UGIIP-III
Design Life	20 years	20 years	20 years with consideration for 50 years flood frequency for rights of way (RoW)
Minimum width	Minor roads 1.0-3.0m Town roads 3.0-5.0m	3.0m for minor access roads With 1.0m shoulder only if RoW permits.	As par drawing
Crest Level	600 mm above normal flood level	600 mm above normal flood level	200 mm above A1B[15] scenario sea levels in 2034
Surface Material	BT, CC, WBM, HBB & BFS	DBC or RCC roads	DBC road 40mm thickness RCC road 150mm thickness
Earthworks	Compacted where necessary either by hand or machine.	Machine compacted in layers and tested	As par drawing
Embankments	Slope 1:1.5	Embankments strengthened with edge protection. Where possible, trees or bushes should be planted on earth embankments	Additional strengthening on roads in flood areas, either CC road
Road/Drain	Overall condition of the roads and drains is not good	Rehabilitation/Re-construction/Construction	Orange –B

Appendix-5 Sample Outline Traffic Management Plan

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; and
- 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.

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

3. Figure A2 to Figure A3 illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyse the impact due to street closure

4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:
   (i) approval from the ULB/CMC/Public Works Department (PWD) to use the local streets as detours;
   (ii) 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;
   (iii) determining of the maximum number of days allowed for road closure, and 3 incorporation of such provisions into the contract documents;
   (iv) determining if additional traffic control or temporary improvements are needed along the detour route;
   (v) considering how access will be provided to the worksite;
   (vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and

(vii) 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.

5. 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.

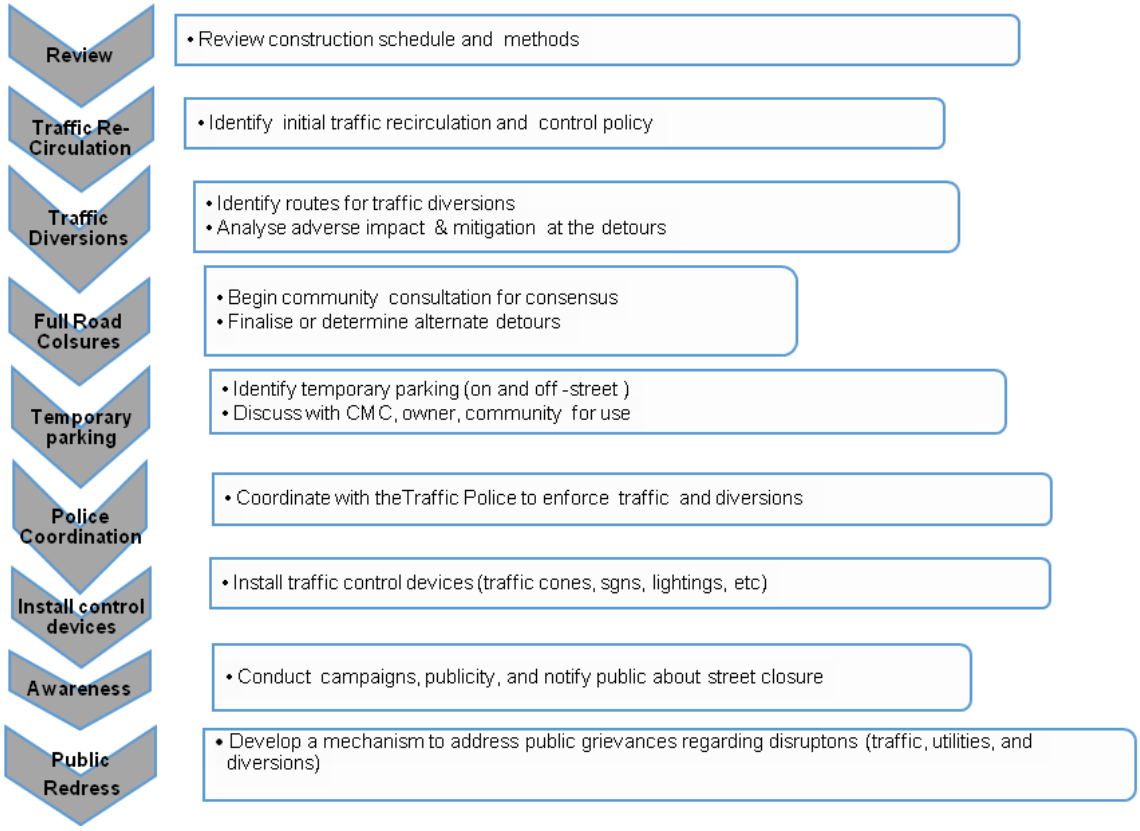

Figure A1: Policy Steps for the TMP

D. Public awareness and notifications

6. 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.

7. 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.

8. 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.

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

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

11. 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

12. 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”).

13. Figure A4 to Figure A5 illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two lane road (two flagger operation)
- Lane closure on a four lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

14. 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.

15. 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 LGED type) for regulating the traffic during night time.

16. 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.

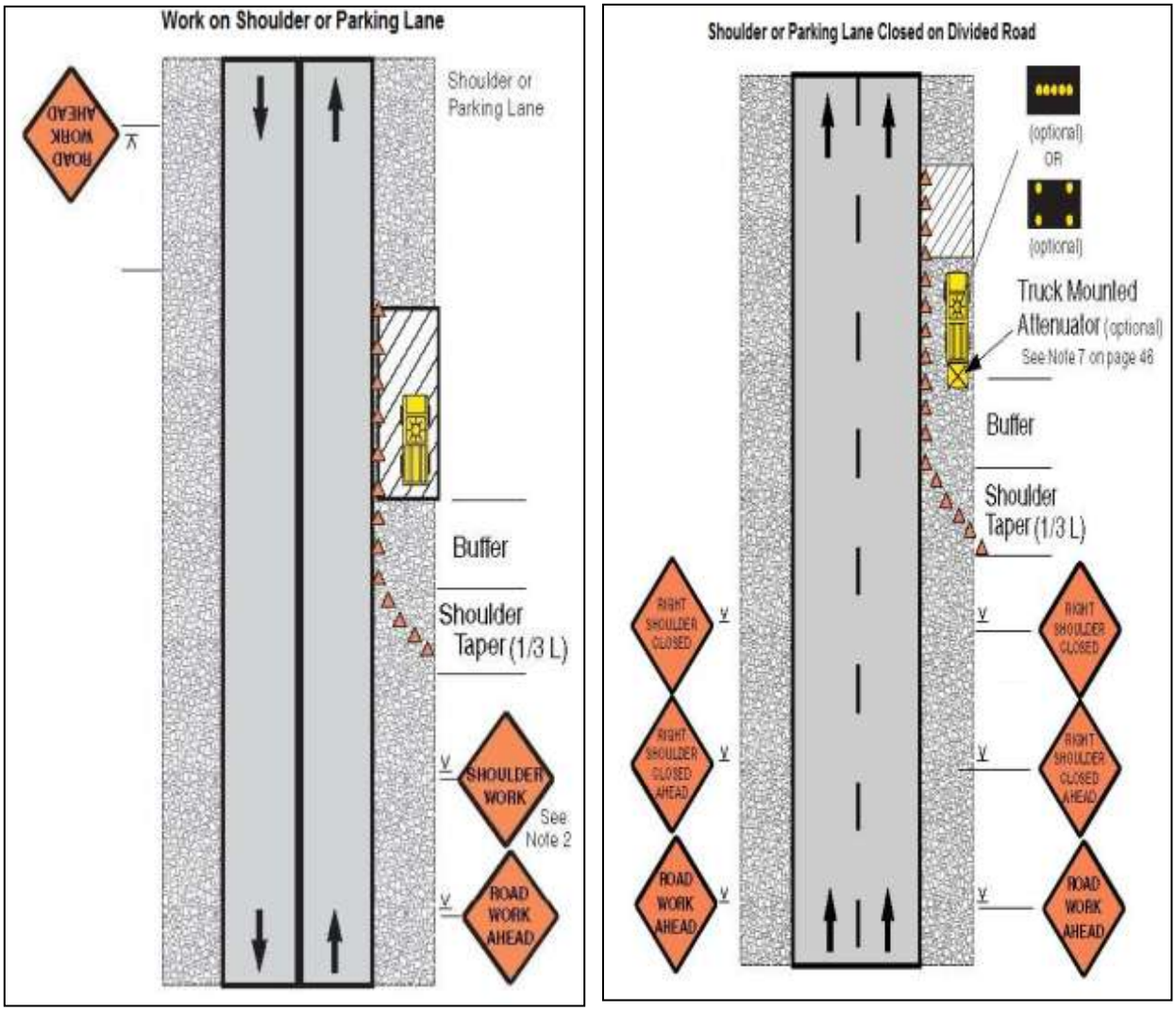

Figure A2 & A3: Work on shoulder or parking lane and shoulder or parking lane closed on divided road

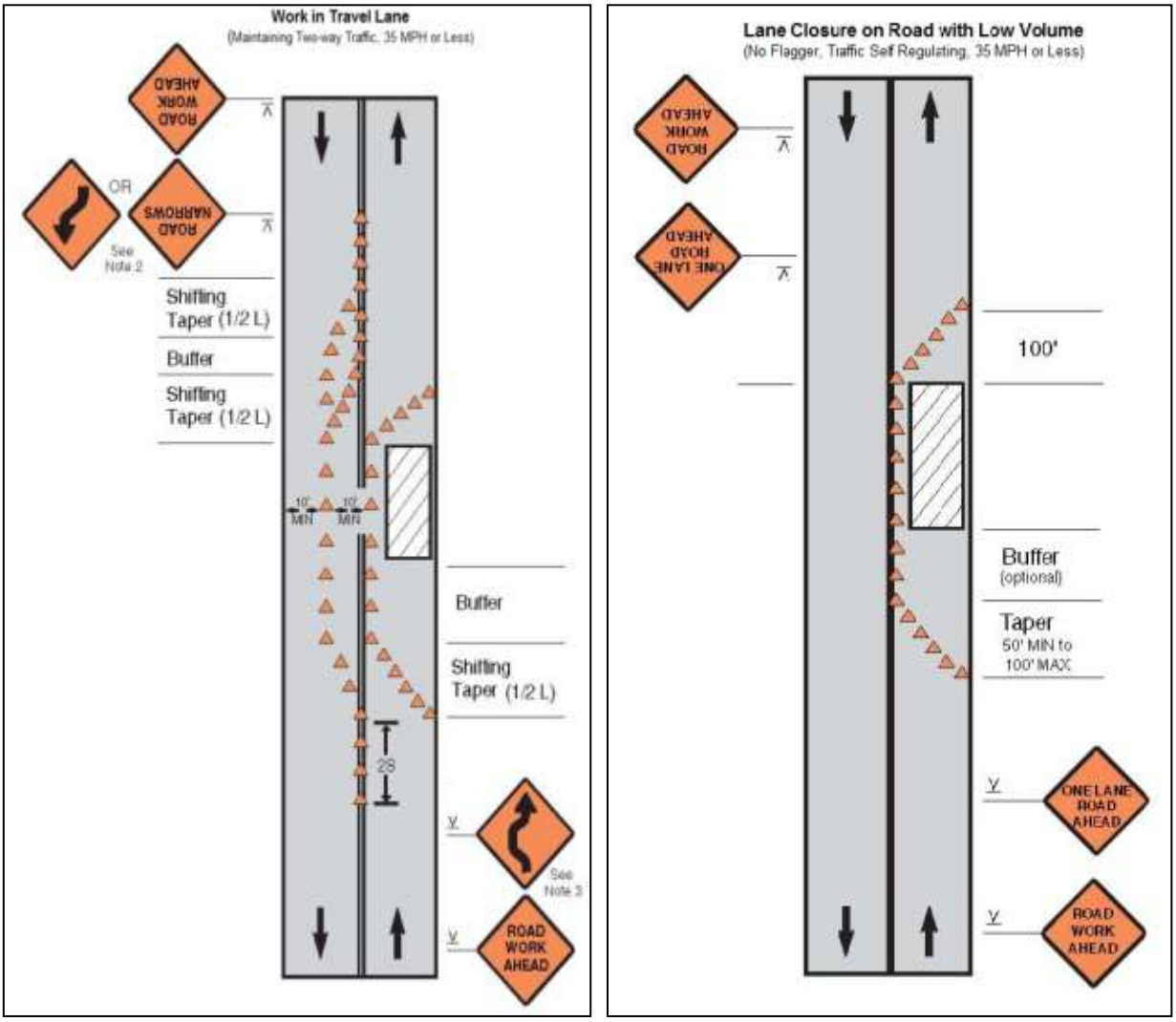

Figure A4 & A5: Work in Travel lane & Lane closure on road with low volume

Appendix-6 Public Consultation

MDS Consultancy Services for Third Urban Governance & Infrastructure Improvement (Sector) Project (UGIIP-III)

[ADB Loan: 3142 BAN (SF)]

Local Government Engineering Department

Appendix-3

PUBLIC CONSULTATION – ENVIRONMENT (FOR Road/Drain Sub-Project)

Name of Pourashava : Shahjadpur

Name of Location :

Visit/Meeting date : 17/05/2016 Time:

List of Participants

Sl. No.	Name	Address	Occupation	Signature
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				

Photograph of the Public Consultation:

17.05.16

Executive Engineer
Shahjadpur Pourashava
Sirajganj

Public Consultation, Shahjadpur Pourashava

Table: Issues of the Public Consultation- Design Phase			
Sl No	**Key Issues/Demands**	**Perception of Community**	**Action to be Taken**
01	Awareness of the project including coverage area	Yes, they are aware of the project that will be improved	No need to take action.
02	In what way they may associate with the project	They will give all types of cooperation for implementation of the project	More consultation before start of the project.
03	Presence of any forest, wildlife or any sensitive/ unique environmental components nearby the project area	No such information available.	No need to take action.
04	Presence of historical/cultural/ religious sites nearby	No such information available.	No need to take action.
05	Unfavourable climatic condition	No such information available.	No need to take action.
06	Occurrence of flood	Road not flooded	No need to take action.
07	Drainage and sewerage problem facing	Not facing drainage problem.	No need to take action.
08	Present drinking water problem-quantity and quality	Drinking water collected by individual deep/shallow tube well	Poura Authority should take more attention to supply drinking water to Poura people
09	Present solid waste collection and distribution problem	Yes, Has solid waste collection and disposal problem	Need improved solid waste collection and disposal system. CBO & Paurashava can solve this problem
10	Availability of labour during construction time	Yes, Local labour is available.	No need to take action.
11	Access road to project site	Yes, it is road project. It will provide access.	No need to take action.
12	Perception of villagers on tree felling and a forestation	Yes, no tree felling in this project.	No need to take action.
13	Dust and noise pollution disturbances during construction work	Yes, they know the impact will be short-term & negligible.	EMP will be prepared to minimize the impact.
14	Setting up construction camp site within the villages/project locality	Yes, no construction camp is required for this sub-project.	No camp or storage site within locality
15	Safety of residents during construction phase and plying of vehicle for construction activities	Yes, they are aware of the safety issues./	Awareness programs will be taken before start of the construction work.
16	Conflicts among beneficiaries downstream users-water supply project using of river water	No use of community water in this project.	No need to take action.
17	Requirements of enhancement of other facilities	Road improvement will enhance the facilities.	No need to take action.
18	Whether local people agreed to sacrifice their lands (cultivable or not) for beneficial project after getting proper compensation	No land is required.	No need to take action.

Summary of Outcome: Shahjadpur is the focal point of communication in this zone. It is the transit point of this locality. It will expedite the development activity of that area. It will lure people from the adjacent areas to settle/rehabilitate in this area. The development activity together with an improved communication facility will boost up the academic sector. Students can shuttle between their academic institution and home without any hassle. It will create employment opportunity and will lead to an upgraded standard of living. The total economic sector will come up at it. It will improve the social sector too.

Appendix-7 Special Condition for Environment Code of Practice (ECOP)

Special Condition for Environment Code of Practice (ECOP) of Road and Drain Sub-project of Shahjadpur Pourashava

Sl. No	Issues	Management Measures	Action By
1	Excavation/ Cutting, filling and clearing of road and drain	During excavating / cleaning work the safety measures need to be taken by the construction crew such as wearing protective clothing, shoes, gloves and face masks. Collected earth and sand need to be cover during transportation.	Contractor
2	Dust & Cleaning	Regular sprinkling of water in the vicinity of the construction site is necessary so that dust is not re-suspended. Frequency of the sprinkling to be three times a day or more based on the extent of activity and dryness of the season; Cleaning to be done in a manner that DoEs not generate or re-suspend dust.	Contractor
3	Cutting of Road	Proper notification should be provided to the public surrounding the construction site. A notice board informing the proposed work should be erected two weeks prior to actual work. An alternative road/detour route need to be constructed for temporary passing the people, rickshaw, van, car private etc.	Contractor/PIU
4	Public Awareness Campaign	A public awareness need to be done before start to the work. This awareness campaign may be done through making posters and sign board near the construction areas.	PIU
5	Noise	Use of ear plugs / muffs is necessary by all construction workers during operation of heavy equipment/ machinery; Wherever feasible, noise absorption padding / enclosures should be used surrounding the noise-generating machinery.	Contractor
6.	Pedestrian & Traffic Safety	Extensive barricading of the construction zone should be provided so that pedestrians do not come into direct contact with the machines, tools, material and other accessories; Provision of barricading to be done so that these do not create traffic safety problems; Supplementary aids / tools such as signboards, reflectors and night lighting to be used to avoid possible accidents.	Contractor
7	Tree-cutting & Safeguarding	Compensatory tree plantation in the ratio of 2 trees planted for every tree that had to be cut due to construction activities; Any tree saved from cutting should be barricaded and protected by the Contractor.	PIU

Sl. No	Issues	Management Measures	Action By
8	Debris Management	Well-defined onsite area for storing of any debris generated; Transporting debris with proper coverage; Disposal in an approved dump yard / landfill.	Contractor
9	Worker safety	Provision of personal protection equipment (PPE) such as helmets, boots and face masks for the workers; Provision of first aid box with basic items.	Contractor
10	Transporting Construction Material	Transporting with adequate safety precautions, e.g. not to use undersized trucks. Adequate covering of trucks that are used to transport material to and from the construction site.	Contractor
11	Storing Construction Material	Well-defined area for storage with suitable containment as required. Proper labelling of different items	Contractor
12	Worker Camps	Adequate disposal of sanitary waste need to be considered in order to follow best waste management practices. Basic hygiene and cleanliness in the worker camps, if any. In particular, toilet facilities should be well-maintained with basic provision of soak pits & septic tanks. Drinking water should also be provided to the workers.	Contractor
13	Monitoring	Ensuring compliance to the ECR rules in terms of ambient air and noise monitoring data.	PIU
14	ECOP for LGED	Need to campaign among the mass about the awareness of the importance of the road, not to create any obstacle on the road side drain, abstain disposal of solid waste to the road side drain etc. Ensuring compliance to the ECR rules in terms of solid waste disposal, ambient air and noise monitoring data during operational period.	PIU

Appendix-8 Outline for Spoil Management Plan – Roads & Drains

I. SPOILS INFORMATION

A. Materials Type
B. Potential Contamination
C. Expected Volume and Sources
D. Spoil Classification

II. SPOILS MANAGEMENT

A. Transportation of Spoil
B. Storage of Spoil
C. Contaminated Spoil
D. Approved Reuse and/or Disposal Sites

III. RECORDS OF REUSE AND/OR DISPSAL