Draft Initial Environmental Examination

May 2017

NEP: Regional Urban Development Project Drainage and Road Construction and Improvement Works at Siddharthanagar Municipality

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 7 February 2017)

Currency unit	–	Nepalese Rupee (NPR)
NPR 1.00	=	$ 0.00930
$1.00	=	NPR 107.52600

ABBREVIATIONS

3R	=	reduce, reuse and recycle
AAPA	=	Aquatic Animals Protection Act
ADB	=	Asian Development Bank
CBS	=	Central Bureau of Statistics
CFUG	=	community forest users group
CITES	=	Convention on International Trade of Endangered Species of Wild Fauna and Flora
DADO	=	District Agriculture Development Office
DDC	=	district development committee
DEECCU	=	District Energy, Environment and Climate Change Unit
DFO	=	District Forest Office
DIZ	=	direct impact zone
DMC	=	developing member country
DSC	=	design and supervision consultants
DUDBC	=	Department of Urban Development and Building Construction
DWEC	=	daily wage execution committee
EARF	=	environmental assessment and review framework
EHS	=	environment, health and safety
EIA	=	environmental impact assessment
EMAP	=	environmental management action plan
EMEP	=	environmental mitigation execution plan
EMP	=	environmental management plan
EPA	=	Environment Protection Act
EPM	=	environmental protection measures
EPR	=	environment protection rules
FGD	=	focused group discussion
FWR	=	far western region
FWRN	=	far western region of Nepal
GDP	=	gross domestic product
GFP	=	grievance focal points
GHG	=	Green House Gas
GON	=	Government of Nepal
GRC	=	grievance redress committee
GRC	=	grievance redress cell
HDPE	=	high density polyethylene pipe
IEC	=	information, education and communication
IEE	=	initial environmental examination
IIZ	=	indirect impact zone
INGO	=	international governmental organizations
ISWM	=	integrated solid waste management
IUCN	=	international union for conservation nature
IUDP	=	integrated urban development project
IWPS	=	integrated waste processing sites
LGCDP	=	Local Governance and Community Development Programme
MOFALD	=	Ministry of Federal Affairs and Local Development
MOFSC	=	Ministry of Forest and Soil Conservation
MOPE	=	Ministry of Population and Environment
MOUD	=	Ministry of Urban Development
MPMC	=	Municipal Project Management Committee

MSW	=	Municipal Solid Waste
NEA	=	Nepal Electricity Authority
NGO	=	non-governmental organization
NRs	=	Nepalese Rupees
NTFP	=	non-timber forest products
NWSC	=	Nepal Water Supply Corporation
OHS	=	occupational health and safety
PAF	=	project affected families
PCO	=	project coordination office
PHC	=	public hearing committee
PIU	=	project implementation unit
PM	=	particulate matter
PMSC	=	project management and supervision consultants
PPE	=	personal protective equipment
PPTA	=	project preparatory technical assistance
REA	=	rapid environmental assessment
RP	=	resettlement plan
RUDP	=	Regional Urban Development Project
SEA	=	strategic environmental assessment
SHS	=	solar home system
SPM	=	suspended particulate matter
SPS	=	Safeguard Policy Statement
SWMTSC	=	solid waste management and technical support centre
TA	=	technical assistance
TLO	=	Tole Level Organization
ToR	=	terms of reference
TSP	=	total suspended particles
VDCs	=	village development committees
WUA	=	water users association
Zol	=	zone of influence

NOTES

(i) The fiscal year (FY) of the Government of Nepal ends on 15 July. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2017 ends on 15 July 2017.
(ii) In this report, "$" refers to US dollars

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EXECUTIVE SUMMARY

1. The Regional Urban Development Project with subproject in Siddharthanagar municipality is financed by the Asian Development Bank under loan number 47252. The Department of Urban Development and Building Construction (DUDBC) under the Ministry of Urban Development (MOUD) is the executing agency and is responsible for technical and project management matters including engineering, safeguards, and social aspects. The Siddharthanagar municipality is the implementing agency. The aim of this project is to increase quality of life and resiliency in Siddharthanagar. The project will improve existing roads with urban design features, and improve the drainage system to improve mobility and safety and reduce waterlogging and flooding.

2. **Subproject scope.** The Siddharthnagar municipality drainage and road construction subproject is one of the subprojects proposed under the RUDP. The subproject includes: (i) construction/rehabilitation of about 10 km of drains to eradicate flooding; and (ii) improvement of about 25 km of city roads to minimize traffic congestion at the city core and reduce dust pollution, and inclusion of urban design features to increase safety and convenience for pedestrians.

3. **Screening and categorization.** An environmental assessment of the subproject is required per ADB's Safeguard Policy Statement (SPS, 2009). An environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for drainage and road construction (**Appendix 1**) was conducted and the results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus Siddharthnagar Municipality drainage and road construction subproject is classified as environmental category B as per ADB SPS and an initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects. This is the Initial Environmental Examination based on the detailed designs.

4. **Implementation arrangements.**This IEE report has been prepared for the construction and improvement works of storm water drainage and roads of Siddharthanagar municipality. DUDBC under MOUD is the executing agency and the proponent of the IEE study is the project implementation unit (PIU) of the proposed RUDP of Siddharthanagar municipality, Bhairahawa, Rupandehi. This PIU is also currently implementing the under the ongoing ntegrated Urban Development Project, which is also financed by ADB and is at advanced stage.

5. **Purpose of the IEE.** This IEE examines the proposed drainage and road construction improvement works in Siddharthnagar Municipality to ensure that the environmental issues associated with the development are effectively managed and they will not damage the environment, and provide guidance for the planning, construction and operation of the proposed subproject. This IEE is based on detailed design.

6. This IEE will be included in the bid documents, 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.

7. **Environmental Management Plan.** 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) a 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.

8. Locations and siting of the proposed infrastructures were considered to further reduce impacts. The concepts considered in design of the subproject are: (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; (ii) taking all possible measures in design and selection of 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; and (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.

9. 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 during low traffic periods, and minimizing inconveniences through quality construction methods. 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.

10. 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 PCO will submit semi-annual monitoring reports to ADB, which will include a detailed review of EMP implementation, including corrective actions taken.

11. The IEE includes design considerations for mitigation, especially design material, and method of construction should be appropriate to make the subproject climate-proof and disaster resilient.

12. **Consultation, disclosure and grievance redress.** The stakeholders were involved in developing the IEE through discussions on-site and public consultations, 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 municipality and will be disclosed to a wider audience via the ADB and MOUD 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 (GRM) is described within the IEE to ensure any public grievances are addressed quickly.

12. **Monitoring and reporting.** The PCO and PIUs through their design and supervision consultants will be responsible for safeguard monitoring. The PIU 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.

13. **Conclusions and recommendations.** The IEE study of the drainage and road construction and improvement works subproject reveals that the benefits from the implementation of proposed drainage and road construction and improvement works project are more significant and long-term in nature against the adverse impacts most of which could be mitigated or avoided. Therefore, this IEE is sufficient for approval of proposed subproject. This subproject is implemented with incorporation of mitigation measures and environmental monitoring plan.

I. INTRODUCTION

1. The Regional Urban Development Project (RUDP) will improve resilient and sustainable urban infrastructure in 8 municipalities located in the southern Terai region of Nepal bordering India. The project will also support regional and urban planning, municipal infrastructure investments, and institutional strengthening to foster regional competitiveness and regional cooperation. The project will also strengthen government capacity for preparation of transformational projects with high readiness for cities in Nepal through a project bank facility.

2. **Subproject scope and location.** The Siddharthnagar drainage and road network improvement works is one of the subprojects proposed under the RUDP. The subproject includes works for improvement of storm water drainage, municipal roads and lanes. The details of the subproject are provided in **Table 6.**

3. **Screening and categorization.** An environmental assessment of the subproject is required per ADB's Safeguard Policy Statement (SPS, 2009). An environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for drainage and flood control (**Appendix 1**) was conducted and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus the subproject is classified as environmental category B as per ADB SPS and an initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects.

4. This is the initial environmental examination (IEE) based on the feasibility study and detailed designs.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

5. 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.

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

(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.

7. **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.

8. **Public disclosure.** ADB will post the safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

(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.

9. **Pollution prevention and control technologies.** During the design, construction, and operation of the project the PMO and PIUs will apply pollution prevention and control technologies and practices consistent with international good practices, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of Nepal regulations differ from these levels and measures, the PCO and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PCO and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Table 1: Applicable WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]		
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour 10 minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO_2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM_{10}	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 2: World Bank Group's Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines[54]		
	One Hour L_{Aeq} (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

B. National Laws

10. Implementation of all subprojects will be governed by the environmental acts, rules, policies, and regulations of the Government of Nepal. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. Many of these are cross-sectoral and several of them are directly related to environmental issues. The most important of these are described as below:

C. Road Construction

11. As per Government of Nepal, Rule 3 of Environmental Protection Act (EPA), 1997 and Rule, 1997 (amended in 2007) as mentioned in schedule 1(D) (1) (b), the construction of the Urban roads requires an Initial Environmental Examination (IEE). Thus, the IEE Study of the Proposal is a respect to mandatory requirement as per this provision.

D. Drainage Works

12. EPR, 1997, Schedule 1, I1 (E) address that the operation of sewerage/drainage schemes of more than NRs. 5,000,000.00 budget require IEE study. The proposed drainage work has investment of more than 5,000,000 thus require an IEE study.

13. In addition, ADB has also classified this project as category B/C in accordance with the environmental requirements of the bank and environmental guidelines for the selected infrastructure development projects. Hence IEE is to be done.

14. Rapid environmental assessment (REA) checklist has also been considered during IEE report preparation based on ADB Environmental Guidelines.

E. National Laws, Policies, Acts, Regulations, Standards and Guidelines

15. Implementation of all subprojects will be governed by Government of Nepal's environmental acts, rules, policies, and regulations. These regulations (Table 3) impose restrictions on the activities to minimize/ mitigate likely impacts on the environment. Many of these are cross-sectoral and several of them are directly related to environmental issues. The most important of these are the Environment Protection Act, 1997 (EPA, 1997), and the Environment Protection Rules (EPR, 1997).

Table 3: List of Acts, Laws, Rules, and Regulations

S.N.	Environmental Acts, Regulations and Guidelines	Description of Requirements
1.	Constitution of Nepal, 2072BS (2015AD)	Constitution of Nepal mandates Environmental Protection as state policy. The State shall give priority to

S.N.	Environmental Acts, Regulations and Guidelines	Description of Requirements
		the protection of the environment, and also to the prevention to its further damage due to physical development activities by increasing the awareness of the general public about environmental cleanliness, and the State shall also make arrangements for the special protection of the environment and the rare wildlife. Provision shall be made for the protection of the forest, vegetation and biodiversity, its sustainable use and for equitable distribution of the benefit derived from it.
2.	Environment Protection Act, 2053 BS (1997AD)	Any development project, before implementation, to pass through environmental assessment, which may be either initial environmental examination (IEE) or an environmental impact assessment (EIA) depending upon the location, type and size of the projects.
3.	Forest Act, 2049 BS (1993AD)	Requires decision makers to take account of all forest values, including environmental services and biodiversity, not just the production of timber and other commodities.
4.	Environment Protection Rules, 2054 BS (1997AD) (Amendment, 1999)	Obliges the proponent to inform the public on the contents of the proposal in order to ensure the participation of stakeholders.
5.	Solid Waste Management Act, 2011	This Act outlines the duties of local government to take action to control haphazard waste generation, disposal or collection and has provisions for various punitive measures against those engaged in activities detrimental to the intentions of the Act. Special features of this act are as follow: • Hazardous waste, medical waste, chemical waste or industrial waste must be managed by the person/ institution responsible for producing/ generating it. • Local body shall only manage the processed hazardous waste/ medical waste/ chemical waste by levying fees. • It shall be duty of every person to reduce the production of solid waste. Further it will be the duty of person/institution to make arrangement for biodegradable waste within its boundary and discharge the remaining waste • Promotion of source separation of waste • Empowers local body the right to set collection point for systematic collection of solid waste • Transportation of solid waste: Only prescribed vehicle shall be used and only segregated waste shall be collected. • Adaptation of reduce, reuse and recycle principle. • Provision for the waste management by the private sector upon receiving of license form the local body • Provision for charging of service fee by the local body for the solid waste management services to the institution/concerned person or body. • Various punishment/penalties who violates this act

S.N.	Environmental Acts, Regulations and Guidelines	Description of Requirements
6.	Soil and Water Resource Conservation Act, 2039 BS (1939 AD)	This Act is enacted to manage the watersheds of Nepal. Section 3 empowers the government to declare any area as a protected watershed area. Section 4 provides that a watershed conservation officer has the authority to implement the following works in protected watershed areas
7.	Land Acquisition Act, 2034 BS (1978AD)	Government can acquire land at any place in any quantity by giving compensation pursuant to the act for any public purposes or for operation of any development project initiated by government institutions.
8.	Local Self Governance Act , 2055 BS (1999AD) and Rules, 2056BS (2000AD)	Empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities.
9.	Aquatic Animals Protection Act 2018BS (1961AD) and first amendment, 1998	This Act provides legislative protection of the habitats of aquatic species. Section 3 of the AAPA renders punishable any party introducing poisonous, noxious or explosive materials into a water source, or destroying any dam, bridge or water system with the intent of capturing or killing aquatic life. However, no agency has been designated the responsibility for administering and enforcing the AAPA.
10.	Water Resources Act, 1992 & Water Resources Regulation, 2000	Water Resource Act is an umbrella act governing water resource management. It declares the order of priority of water use; vests ownership of water in the state; prohibits water pollution; and provides for the formation of Water User Association and system of licensing. The Regulation sets out the procedure to register a WUA and to obtain a license and sets out the rights and obligations of WUA and license holders.
11.	Labor Act, 1991AD	It emphasizes on occupational health and safety of workers thereby providing necessary safety wares and adopting necessary precautionary measures against potentially hazardous machines/equipment. It stipulates to make arrangements such as removal of waste accumulated during production process and prevention of dust, fume, vapor and other waste materials, which adversely affect the health of workers. The provisions related to environment in labor law can be summarized as: • Spells about the provision for a healthy, safe and secure environment for workers. • Prescribes provisions for solid waste management and control noise pollution in the working areas, • Imposes mandatory provision that only Nepal citizens can be employed on permanent basis in any enterprises, permission must be sought from the Labor Department to employ non-Nepali specialists on contract basis.
12.	Child labor (Prohibition and Regularization) Act, 2001AD	The Child Labor (Prohibition and Regulation) Act 2000 is the main legal expedient to prohibit engaging children in factories, mines or similar risky activities and to make necessary provisions with regard to their health, security, services and facilities while engaging them in other activities. Under the Section 3 of the Act, child having not attained the age of 14 years is strictly prohibited to be engaged in works as a laborer. Similarly under Section 4,

S.N.	Environmental Acts, Regulations and Guidelines	Description of Requirements
		engagement of child in works as a laborer against his/her will by way of persuasion, misrepresentation or by subjecting his/her to any influence or fear or threat or coercion or by any other means is prohibited. Under Section 6, in case any Enterprise has to engage a child in works, an approval has to be obtained from the concerned labor office or any authority or official prescribed by that office and form the father, mother or guardian of the child.
13.	Electricity Act, 1993	Clause 24 of the Electricity Act 1993 states that "No Substantial Adverse Effect be made on the Environment" and that "While carrying out electricity generation, transmission or distribution, it shall be carried out in such a manner that no substantial adverse effect be made on environment by way of soil erosion, flood, landslide, air pollution etc."
14.	Public Roads Act, 1974AD	The major provisions of the Public Roads Act, 1974 are: • Prescribes rules for planned road construction; regulating road width and boundaries, within which no houses can be built; • Maintains road environment through plantation along public roads; • Government of Nepal agencies and public need prior approval from Department of Roads to carry out work on roads and road boundaries.
15.	Forest Rules, 2051BS (199AD)	Elaborates legal measures for the conservation of forests and wildlife.
16.	Local Self Governance Regulations, 2000	This regulation empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities
17.	Solid Waste Management Rules, 2013	Solid Waste Management Rules have provided authority to local bodies for the segregation, transportation and disposal of solid waste as well as operation of sanitary landfill site. Local bodies may also empower the company, organization and agency, producing solid wastes, for segregating, reducing the solid wastes at its source, reuse and recycling use solid wastes and mobilize community and non-governmental organization for creating awareness for the management of the solid waste. Local bodies have also the authority to determine service charge for solid waste management.
18.	Three Years Interim Development Plan, GoN, 207-2073BS (2013-2016AD)	The plan focuses on the need for setting up national environmental standards with strategy of internalizing environmental management into the development programs. The plan has also realized to carryout strategic environmental assessment (SEA) with the long term policy of promoting environmental governance. The plan emphasizes on the local participation in environmental conservation, as envisaged in the Local Self Governance Act, 2055, through the local bodies, make them responsible and capable to manage local natural resources.
19.	National EIA Guidelines, 1993	The guidelines provide guidance to project proponent on integrating environmental mitigation measures, particularly on the management of quarries, borrow pits, stockpiling of materials and spoil disposal, operation of the work camps, earthworks and slope stabilization, location of stone crushing plants, etc.

S.N.	Environmental Acts, Regulations and Guidelines	Description of Requirements
20.	Environmental Guidelines published by MOPE, 2006	The guideline provides clear directions about the process of conducting EIA. This guideline makes EIA in Nepal legally mandatory and contains process for ensuring public involvement during the preparation of EIA report. It calls for information regarding identification of physical, biological, socio-economic and cultural impacts. Impacts ranking method also suggested in this guideline. It stresses the inclusion of mitigation measures to avoid, minimize and mitigate adverse impacts and maximize beneficial impacts resulting from the development project and Monitoring & environmental auditing in the EIA report. Its revision in 1997 calls for the ensuring local people's participation , collection of relevant information, identifying major issues of public concerns, evaluate them and establishing priorities for EIA study. The Environmental Guidelines published by MOPE (2006) contains the following components: • Methods for screening of the projects requiring an application of Environmental Assessment Scoping, impact identification and prediction, report review, monitoring and evaluation and impact auditing; • Methods for ensuring public participation during the preparation of the EIA report, including the need for clear documentation of the impact mitigation measures in the EIA report; • Provisions for identifying socio-economic-cultural, biological, and physical impacts and prescription of mitigation measures to avoid, eliminate and/or minimize adverse effects and to augement beneficial impacts resulting from the project implementation; and • Emphasis on the adoption of monitoring, evaluation and environmental auditing frameworks in the EIA report.
21.	Batabaraniya Nirdesika (Nepal, MLD), 2057BS (2000AD)	The directive is focused in the practical implementation of small rural infrastructures through the minimization of environmental impacts. This directive includes the simple methods of environmental management in the different phases of the project cycle. More emphasis is given to prevention rather than cure. So, the recommendations for the mitigation measures are provided only when it is necessary.

16. Environmental Protection Rules, 2054 (1997) lists in its Schedule 2, the types of projects which require an IEE. The following are relevant in the context of RUDP subprojects:

(i) Improvement, upgrading and reconstruction of national highways and feeder roads;

(ii) Supply of drinking water to a population ranging from two thousand to twenty thousand;

(iii) Waste management activities to be undertaken with the objective of providing services to a population ranging between 2,000 and 10,000;

(iv) Filling of land with 100 to 1,000 tons of waste a year; (landfills of more than 1000 t per year would require an EIA);

(v) Selecting, picking, disposing, and recycling waste through chemical, mechanical or biological techniques in an area up to two hectares;

(vi) Activities relating to compost plants in an area ranging between 1 to 5 hectares;
(vii) Operations of sewerage schemes;
(viii) Clearing of national forests covering up to one hectare in the hills and five hectares in the Terai.

17. Schedule 2 also lists the projects requiring an EIA. It mentions projects to be implemented in "flood prone and other dangerous areas"; it is therefore recommended, especially in the case of larger schemes (the largest being waste disposal sites, where flood risks are an issue), to clarify this question with the competent authorities in an early stage of project preparation.

18. Environmental Guidelines (2006) published by the MOPE makes EIA in Nepal legally mandatory and contains process for ensuring public involvement during the preparation of EIA report. It calls for information regarding identification of physical, biological, socioeconomic and cultural impacts. Impacts ranking method is also suggested in this guideline. It stresses the inclusion of mitigation measures to avoid, minimize and mitigate adverse impacts and maximize beneficial impacts resulting from the development project and monitoring and environmental auditing in the EIA report.

19. The Environmental Guidelines (2006) contain the following components:
(i) Methods for screening of the projects requiring an application of environmental assessment scoping, impact identification and prediction, report review, monitoring and evaluation and impact auditing;
(ii) Methods for ensuring public participation during the preparation of the EIA report, including the need for clear documentation of the impact mitigation measures in the EIA report;
(iii) Provisions for identifying socioeconomic-cultural, biological, and physical impacts and prescription of mitigation measures to avoid, eliminate and/or minimize adverse effects and to augment beneficial impacts resulting from the project implementation; and
(iv) Emphasis on the adoption of monitoring, evaluation and environmental auditing frameworks in the EIA report.

20. **Table 4** provides the environmental classification of RUDP subprojects. Siddharthnagar municipality roads and drainage subproject falls within Category B.

Table 4: Environmental Classification of Proposed Subprojects Per Government of Nepal Environmental Guidelines (2006)

Subproject	Component	Key Activities	Environment Classification
1. City road improvement	Road provisions (include road resurfacing, roadside footpath, roadside drains, road signs, road/pavement markings, intersection improvement, or high mast lighting)	re-construction and extension of road (feeder road, local road)	Category B IEE to be prepared
2. Drainage improvement	Primary network (includes domestic connections or primary drains)	Engineering works	Category B
	Secondary network (includes secondary drains)	Engineering works	IEE to be prepared
	Tertiary network (includes main drains and drainage outfalls)		

Subproject	Component	Key Activities	Environment Classification
3. Municipal Building/ Public Building	Construction of public buildings	No similar facility	Category B IEE to be prepared
4. Water supply	Source augmentation (includes tube wells, surface water intake, overhead or ground reservoir, pumps and pump house, water treatment plant [WTP] or chlorination facility)	Engineering works	Cat B IEE to be prepared
	Water transmission (includes pumping main, overhead reservoir, or pumps and pump houses)	Water, power and gas distribution line laying/ relaying/extension.	Category B IEE to be prepared
	Network improvements (include ring main, distribution/ carrier mains, bulk valves and flow meter, household connections or household meters)		
5. Solid waste management	Community storage bins	No similar facility	Category B IEE to be prepared
	Secondary transfer station		
	Waste disposal (includes sanitary landfill, composting site, or access road)	Land-filling by industrial, household and commercial wastes	Category B IEE to be prepared Category A if sites are considered flood prone or other dangerous area

F. Conventions, Treaties and Protocols

21. Nepal is party to the following international conventions (**Table 5**) that may apply to this project, especially in selection and screening of subprojects under restricted/ sensitive areas.

Table 5: International Agreements and Applicability to RUDP Subproject

Agreement	Requirements for the Project
1. Ramsar Convention on Wetlands of International Importance, 1971. The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. According to the Ramsar list of Wetlands of International Importance, there are 25 designated wetlands in Nepal which are required to be protected.	There are 10 Ramsar Sites in Nepal however they are not located within or adjacent to the any of the subproject sites. If in future any of the activities are undertaken in the proximity of Ramsar wetlands, it shall follow the guidelines of the convention (The Ramsar Convention Handbooks for the wise use of wetlands, 4th ed. (2010), (http://www.ramsar.org/cda/en/ramsar-pubshandbooks/main/ramsar/1-30-33_4000_0__)
2. Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal, 1989	Municipal waste/ hazardous waste; sludge/ rejects generated from the municipalities may fall in hazardous waste category. They will be

Agreement	Requirements for the Project
To protect human health and the environment against the adverse effects of hazardous wastes. This aims at (i) reduction of hazardous waste generation, promotion of environmentally sound management; (ii) restriction of transboundary movements; and (iii) a regulatory system for transboundary movements.	managed at the landfill sites and will be disposed within the country, and therefore will not attract this convention.
3. Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)	This convention defines and provides for the conservation of the world`s heritage by listing the natural and cultural sites whose value should be preserved. Not applicable for identified subprojects. Site selection for the succeeding subprojects can refer to the existing list, if available, to avoid impacts in areas with cultural and natural heritage value.
4. Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington 1973) – also known as CITES was signed on 20 November 1981.	This convention provides a framework for addressing the overharvesting and exploitation patterns that threaten species of flora and fauna. Under the Convention, the governments agree to restrict or regulate trade in species that are threatened by unsustainable patterns. Not applicable for subprojects. The succeeding subprojects will ensure that the same will not cause any harvesting and exploitation of wild flora and fauna during construction and operation.
5. Convention on Biological Diversity (1992)	This provides for a framework for biodiversity and requires signatories to develop a National Biodiversity Strategy and Action Plan. Not applicable for subprojects. The succeeding subprojects will refer to the applicable Biodiversity Strategy and Action Plan in selecting the project sites and that any replacement to cleared vegetation resulting from the project will be consistent with the objectives and priorities of the Action Plan.
6. United Nations Framework Convention on Climate Change (UNFCCC), 1993	The UNFCC is an international environmental treaty with the main objective to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system. Nepal signed the UNFCC on 22 April 2016 and ratified it on 5 October 2016. The project will ensure that all construction activities will not significantly increase the GHG emissions and ensure that design of all infrastructure are resilient climate change impacts

III. DESCRIPTION OF THE PROJECT

22. The project consists of: (i) construction/ rehabilitating about 3 km of the existing drainage system and newly drainage system to avoid flooding, and (ii) providing about 25 km of the city roads with drainage to minimize traffic congestion at the city core; so as to raise the quality of the infrastructure and services, thereby improving the quality of life of the people. Siddharthanagar is growing at a rapid pace. Its development is constrained by a poor,

inadequate drainage system, waste management, and poor city roads. A number of areas in the municipality get inundated during the monsoons, hampering normal life.

Table 6: Salient Features of Project

S.N	Particular	Description
1	Project Name	RUDP, Siddharthanagar, Bhairahawa
2	Loan	Loan No. 47252
3	Sub-project	Urban Roads & Strom Water construction & improvement Woks
4	Location	Siddharthanagar Municipality, Rupandehi, Nepal
5	Area of Municipality	36.03 Sq.Km (3063ha) with 13 wards
6	Total Population of Municipality	63483 (acc. to census 2011)
7	Population Growth	2.07% (acc. to census 2011)
8	Households	12497 (acc. to census 2011)
9	Average Household Size	5.08 (acc. to census 2011)
10	Affected Localities	Siddharthanagar Municipality including all 13 wards.
11	Topography	Flat Land of Terai, altitude of 102 to 109 m amsl, Latitudes $27^0$31'N& Longitude $83^0$26'E
12	Geology	Terai Plain alluvium
13	Land Use Pattern	Cultivated land followed by orchard, Bush, barren, Built up, forest, Water body & pond.
14	Climate	Hot Humid in mid-summer up to 43.7^0C& 29.9^0C maximum & 17.3^0C minimum during winter, average annual rainfall (2000- 2012 A.D.) is 1391mm.
15	Major Natural Water Course	Danda and Ghaghara Nala.
16	Significant Human Made Features	Drain from Aanchalpur to Children Park, Drain from Prabhat Path to Siddhartha Highway, Drain From Shanti Path to Bus Park etc.
Storm Water Drainage		
17	Proposed Drain	Diversion drain (2 No)
18	Types of Drain (as per section)	Rectangular Brick section and having partially cover
19	Tentative length for improvement	3 km including new construction
20	Crossing structure	Slab culverts- 24 Nos.(Double cell) and 5 Nos. (Triple Cell)
21	Protection Structure	Gabion protection as per site condition at a diversion and river protection work.
Urban Road		
22	Proposed Road Length	24.5 Km
23	Affected area	Siddharthanagar Municipality
24	Type of Road	Urban Road
25	Type of Surface	Metallic
26	Pavement design	Based on TRL overseas Road Note 31 (4th edition)
27	Type of pavement	Asphalt pavement
28	Right of way (RoW)	6 to 25 m as prescribed by municipality from center line on both side
29	Formation width	Varies as per RoW
30	Bridge/culvert	Slab Culvert
31	Side drain	Rectangular Brick Section with cover slab
32	Foot path	Remaining space from RoW and side drain cover applicable
33	Road furniture /median strips/parking space	Applicable as the space applicable
34	Estimated total cost including contingencies & VAT	NRs. 2,383,423,686.24
35	Expected completion Date	December, 2018

Source: Design Report 2016 of proposed project RUDP.

A. Description of the Subprojects

1. Drainage Improvements/ Rehabilitation

23. The purpose of the proposed drainage subproject is to improve the town's drainage system to minimize the flooding that occurs every year during the monsoons. The project aims to:

(i) Eliminate cross-sewer connections;
(ii) Rehabilitate (lining, widening, etc.) and desilt the existing drains;
(iii) Augment and rectify the missing links of existing drains; and
(iv) Provide new drains.

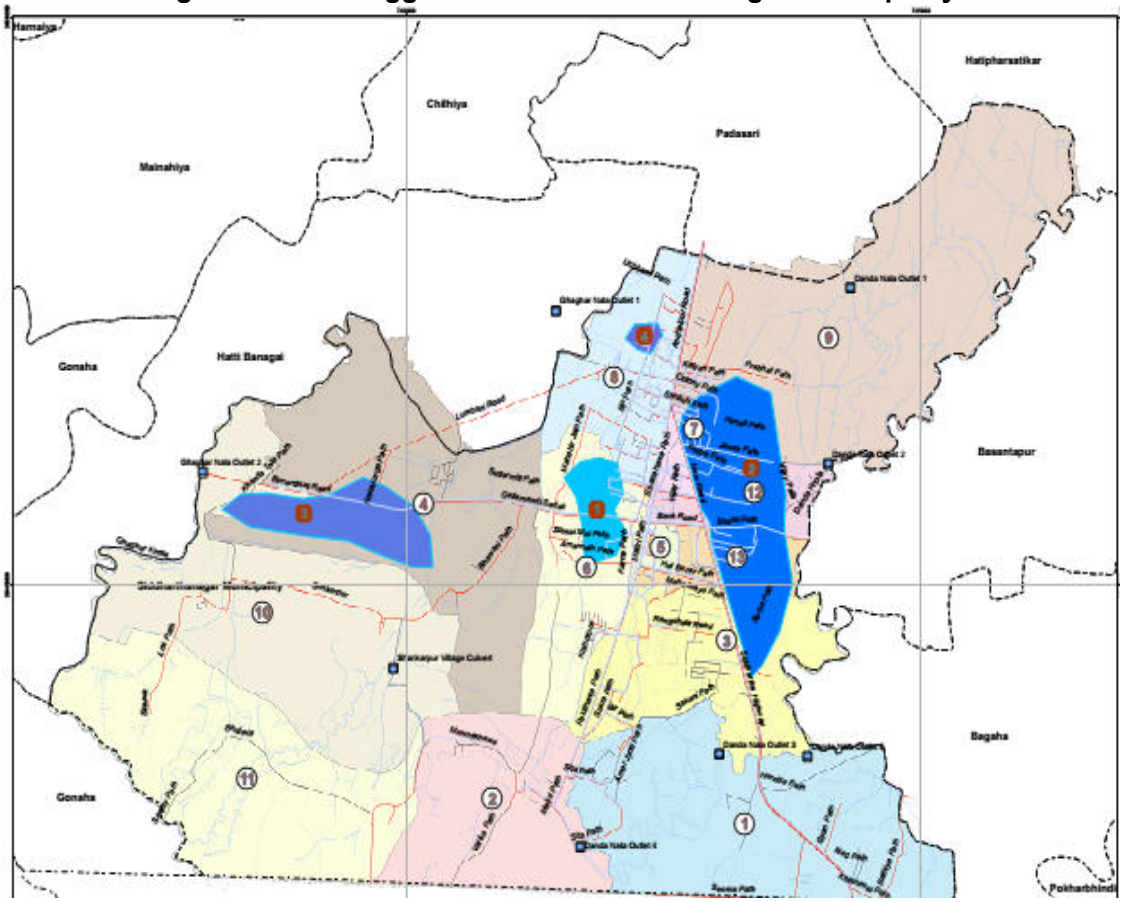
24. The drainage improvement works consist of the following components:

Table 7: Drainage Components

S. N.	Drain Code	Description	Outlet Point	Length (Km)	Type of Drain
1	KSS	Khajana Road to Stadium road and drains at sakuni path	KN Nla	1.116	Rectangular Brick Masonry
2	Aanapurna Path (Kalika Nasary) to HCGN Nala	Aanapurna Path near Kaika Nasary and drains to HCGN Nala	HCGN	0.998	Rectangular Brick Masonry
3	Aadhiyat Path- Danda River	Aadhiyat path and drains to Danda Nala	Danda Nala	0.546	Rectangular Brick Masonry

Ha=hectare, km = kilometer, m = meter.

Figure 1: Water logged areas in Siddharthanagar Municipality



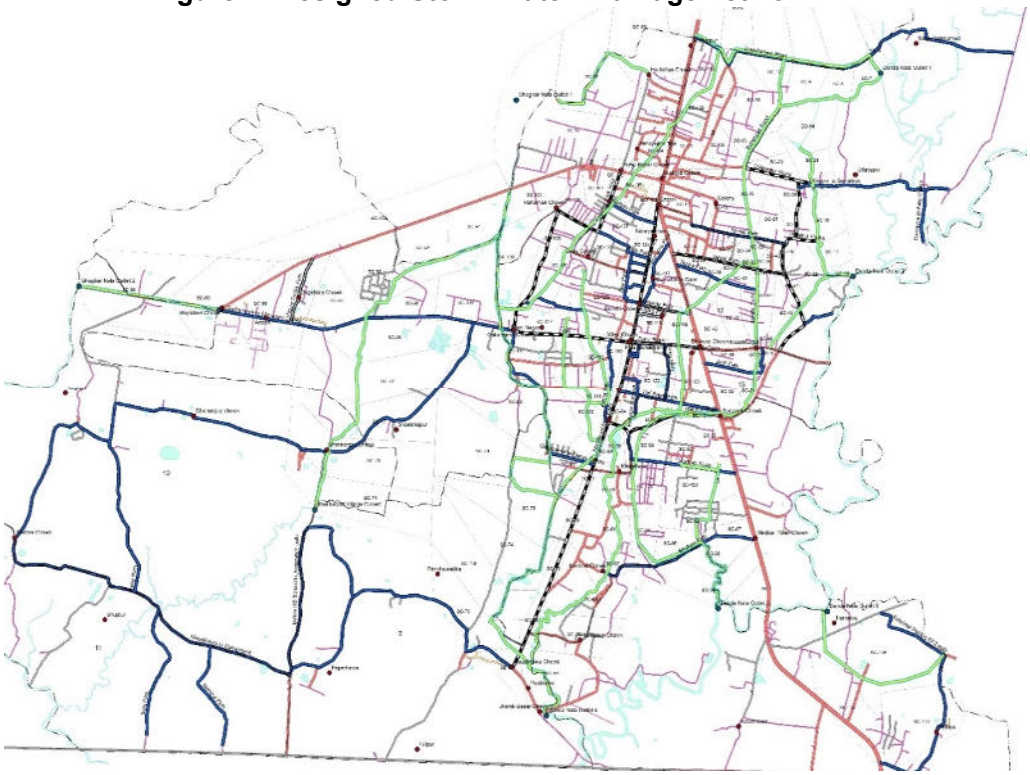
Source: Design Report of Drainage and Roads, IUDP, Siddharthanagar, 2013

Table 8: Lists of Water logged area of Siddharthanagar Municipality

S.N.	Place Name	Ward No.	Area, (Ha)
1	Gallamandi Area	6	37
2	At East of the highway	3, 7, 12 & 13	170
3	Airport Area	4	80
4	Anchalpur Area	8	6

Source: PPTA Siddharthanagar and verification study by DSC, IUDP, 2013.

Figure 2: Designed Storm Water Drainage network



City Roads Improvements/Rehabilitation

Table 9: Proposed Roads for Footpath and Road Utilities under RUDP for Improvement

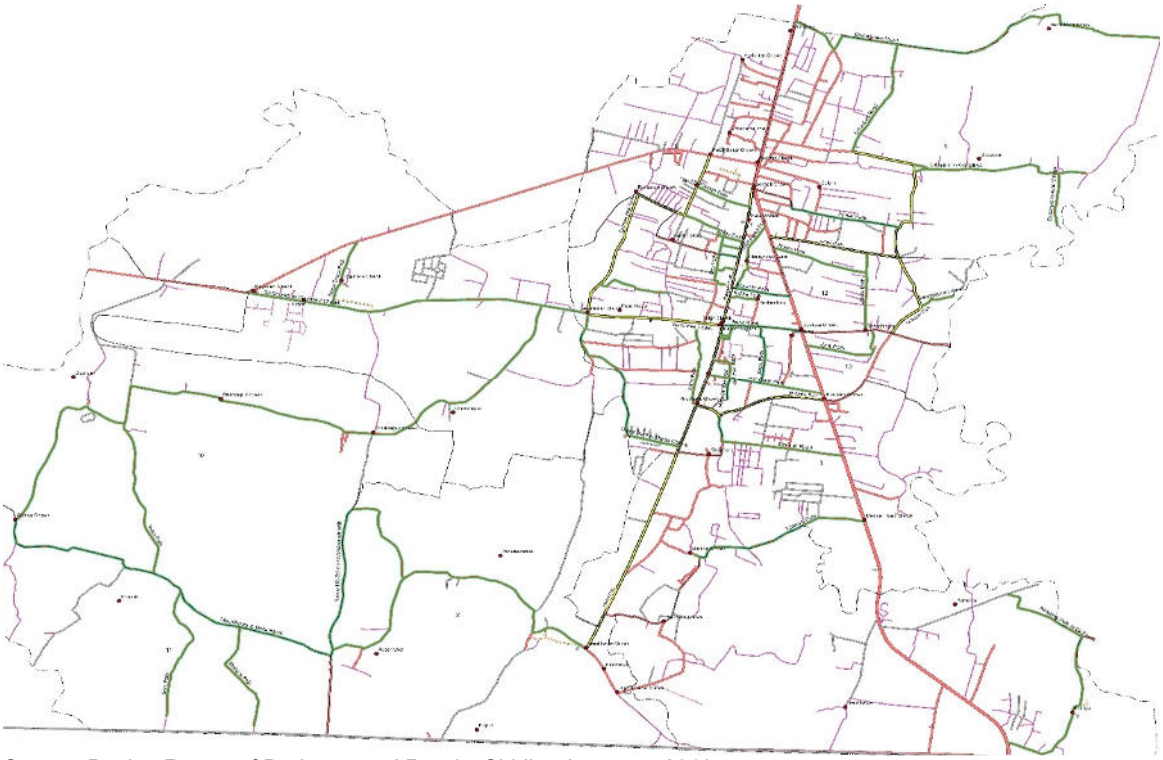
S.N.	Road Name.	Ward No.	RoW (m)	Total Length(m)
1	Udaypur Road	7/9/12	12	1943.71
			6	
			12	
			20	
2	Janak Path	7/12	25	900.00
3	Children Park Road	6/8	9	1841.00
			12	
4	Khajana Road	3	12	920.00
5	Gallamandi Road	5/16	12	1.00
			16	
6	Narayan Path	7/8/12	1.25 after drain end (means 16.7 to 18)	1046.00
7	Maitri Path	2/3/5/6	1.25 after drain up to Khajana Path (means 16.7 to 18)	2675.00
			20	

Table 10: Proposed Roads including Footpath and Road Utilities under RUDP for Improvement

S.N	Name of road	Ward No.	Total length (m)	RoW (m)
1	Bimanghat Road (Laxmi path culvert-Mayadevi path)	6/4	2465.42	20 and 16
2	Haatbazaar Path (Maitri Path-Siddhartha Highway)	13	788.71	11 and 15
3	Binayak Path (Haatbazaar-Darshan kalyan samaj-JBKN Nala)	13	167.91	6
4	Himali Path (Siddhartha Highway-Udaypur Road)	7	816.49	11
5	Janata Path (Shanti Path-Janak Path)	12	588.31	10
6	Rudra Path (siddhartha Highway-Janta Path)	12	669.46	6
7	Karna Path (Gallamandi road-Maitri Path (Nirvana Hotel))	6	665.87	8 and 6
8	Jyoti Path (Siddhartha Highway-Shanti Path)	3	653.61	6
9	Sewa Path (Bank Road-Haatbazaar Path)	5/13	451.07	10
10	Gallamandi to Durga Coloni Road	6	1467.67	25 and 10
11	Shiva Path (Narayan Path-BP Path)	8	473.74	9
12	Sakuni Path (Siddhartha Highway-UCMS Medical College-Bir Path)	3	1524.82	12.5
13	Basant Path (Aawa Road) (Narayan Path-Siddhartha Highway)	7/12	396.84	As per field coondition (12.5)
14	Brihaspati Road (Pravat Path-Dumdumuwa Road)	9	912.41	As per field condition (8.23 and 14)
15	Dumdumuwa Road (Siddhartha Highway-Goligad Chowk-Sano Dumdumuwa Gau)	9	2000	15 and 9
16	Kailash Path (Narayan Path-BP Path)	8	381.11	9
17	Bhairahawa gau path (Aawa Road-Siddhartha Highway)	7	508.98	8 and 6
18	Karnimai Path (Maitri Path-CDO Office-Haatbazaar Path)	5/13	219.66	12.5
19	Karnimai Path (CDO Road-PIU Office-Karnimai Temple)	5	64.34	12.5
20	Kalika Path (Narayan Path-Kalika Path)	12	184.65	8
21	Sahid Path (Narayan Path-Kandu basiya Dharamsala-Children Park	6	934.92	8
22	Stadium Road (Siddhartha Highway-Durga Path)	3	1031.72	25 and 12
23	Gonahiya Road (Udaypur-Gonahiya Gau)	9	1160	15
24	Gonahiya Road (Gonahiya Gau-Auto Village)	9	377.05	12
25	Bank Road (Milan Chowk-Devkota Chowk)	5/12	530.36	12 and 15

S.N	Name of road	Ward No.	Total length (m)	RoW (m)
26	Dev path (Narayan Path-Shiva Path)	8	480.33	7.62
27	Nagarpalika path (Bank Road-Maitri Path)	5	178.64	8
28	Pawan mistwand road (Maitri Path-Nagarpalika Path)	5	62.03	7
29	Shanti path (Narayan Path-Dev Path)	8	137.62	6
30	Bank Coloni Road (Up to Dev path from Narayan Path)	8	125.86	6
31	Navadurga path (Bimanghat Road-Lumbini Road)	4	528.69	6
32	Kotaimai path (Siddharth Highway-Kotaimai Temple-Madarsa)	1	1306.71	8
33	Aadhiyat Path (Shanti Path-Buspark-Siddhartha Highway)	13	729.2	12 and 14
34	Sima Path	2	960	16
35	Pravat Path (Siddhartha Highway-Ward Office-9)	9	597.77	12
	Total		**24541.97**	

Figure 3: Roads to be Rehabilitated and Improved



Source: Design Report of Drainage and Roads, Siddharthanagar, 2013

B. Delineation of Project Area

25. In general as per nature, extent and magnitude of impact; the influenced area is delineated as below.

26. **Direct Impact Area/ Zone** is the area which is affected directly by proposed drainage and road construction and operation works. Hence direct impact area for the roads and drainages is taken as 50 to 100 m from the road/ drainage edge. Similarly; the impacts associated with the project having direct effect to the area are taken as Direct Impact area.

27. **Indirect Impact Area/ Zone** is the area which is not directly influenced but indirect effects and impacts are seen due to the construction and operation of proposed drainage and road. The project municipality i.e. Siddharthanagar municipality is taken as Indirect Impact Area. While conducting IEE Study, detail study up to 100 m distance on both sides of the proposed road cross section and Drain was done to find out the information of environmental parameters and issues/ impacts due to construction and operation of proposed drainage and road.

C. Materials to be used

28. The main materials used for the proposed works are sand, stone, bricks, cement, reinforcement, wood, hume pipe, aggregates, earth, and water.

29. The estimate of the quantity of materials required and work is provided in the table below.

Table 11: Estimate of the Quantity of Materials Required

S.N	Particulars	Unit	Quantity
	Earthwork		
1	Site clearance including removal of bushes, debris, rubbish etc. and removal at disposal material as per specification and instruction of Engineer	m^2	159182.85
2	Excavation in roadway, drain and retaining structures foundation, culvert foundation, water supply pipe line and all complete in all type soil including removal and satisfactory disposal and stacking or hauling (to sites of embankment construction) of suitable cut materials as required and excavation for existing all type of pavement as per specification and instruction of engineer		
2.1	Earthwork Excavation (Machinery Excavation)	m^3	140638.76
2.2	Earthwork Excavation (Manual Excavation) for water supply only	m^3	12182.37
3	Construction of roadway in embankments, footpath and miscellaneous backfilling for structures areas with approved material obtained either from excavation for road construction or borrow pits or other sources excluding the excavation components as per specification and instruction of engineer.	m^3	221099.76
4	Transport within 10 km with placing, leveling and compacting of removal materials from road, drain and structures as per instruction of engineer	m^3	50375.00
	Drainage and Pavement Works		
1	Supply, place and compact of pitching/soling works, according to design lined and level all complete as per drawing, specification and directed by engineer		

S.N	Particulars	Unit	Quantity
1.1	Brick soling	m^2	24581.49
1.2	Stone soling	m^3	49602.61
2	Provide, placing, laying and all complete of masonry works for structures as per specification and instruction of Engineer		
2.1	Brick Masonry (1:4)	m^3	7132.99
2.2	Stone masonry (1:4)	m^3	25424.24
3	Provide and placing plaster and all complete works for structures as per specification and instruction of Engineer		
3.1	12.5 thick plaster (1:4)	m^2	15654.49
4	Provide, placing and all complete concrete works for structures as per specification and instruction of Engineer		
4.1	PCC (M15)	m^3	7960.98
4.2	PCC for RCC (M20)	m^3	22956.98
5	Providing and placing of reinforcement bar of high yield for the causeway, cover slab, grating and proposed infrastructures including cutting, placing, binding and fixing and all complete as mentioned in drawing, specification and directed by the engineer	MT	2432.73
6	Providing, placing, supporting and desuttering of plywood form work in proper line and level for cover slab, structures, causeway, culverts and etc. as per drawing, specification and Instruction of engineer.	m^2	30450.75
7	Providing, placing, and all complete of Bitmune Joint Filler works as per specification and instruction of engineer.	m2	4457.10
8	Providing, placing, and all complete of one coat red oxide for grating painting works as per specification and instruction of Engineer	m2	135.20
9	Kerb Stone: Providing and laying M 20/20 Precast or Cast in situ concrete in kerbs with 12mm thick 1:3 cement sand mortar bedding and joints including foundation excavation levelling etc. but excluding foundation concrete or sand gravel materials as per standard specification and instruction of engineer.	rm	54969.29
10	Sub-grade: Preparation of sub-grade for rehabilitation or other similar works (filling or cutting depth of 10 to 20 cm) in gravel, soft, hard & boulder mixed soil as per drawing, specification and instruction of Engineer	m^2	195906.04
11	Sub-base: Supply and laying of sub-base works including compaction as per specification	m^3	55147.53
12	Base: Supply and laying of graded level crushed stone base materials including compaction as per specification	m^3	24812.81
13	Prime coat: Providing, mixing, laying, compacting, transport and all complete of prime coat as mentioned in drawing, specification and directed by the engineer.	Lit.	141787.53
14	Asphalt: Provide asphalt concrete pavement including compaction to required level as per specification.	m^3	7089.37
3.3	Random rubble stone masonry in cement mortar	m^3	254.27
3.4	Cutting reinforcement in dismantling R.C.C or R.B work. (to be calculated on the basis of cross-sectional area i.e length x thickness)	m^2	1,452.97

S.N	Particulars	Unit	Quantity
3.5	R.C.C pipes up to 600mm dia.	rm	288.00

30. Emissions resulting from the implementation of the proposal

31. **Solids**. As the project is construction and improvements of the roads and drainage at Siddharthanagar municipal area, there will be relative small amounts of material to be excavated and dumped as spoil and also the materials excavated will be used for compaction of inner city roads.

32. **Liquid.** No remarkable amount of liquid materials will be emitted from the project implementation.

33. **Gas**. Gaseous emissions are less due to the implementation of the proposal.

34. **Noise.** The current noise level at the project area is not in pristine condition and due to the heavy traffic, there is noise pollution and at the time of implementation of the proposal also, due to traffic congestion and heavy traffic, the noise level will increase. During construction, the movement and operation of construction plant, equipment's and vehicle will increase noise level to some extent. During project implementation also, there will be more traffic than at present level which will obviously increase noise level.

35. **Dust**. The dust level in the air is observed generally to be huge during movement of vehicles along the road. The construction works will also increase the dust level but at the time of operation of project, the dust level will be minimized by using sealed bituminous layer, and hence the dust pollution will be controlled much better at the time of operation of the project.

D. Energy to be used

36. Proposed works requires a substantial amount of fossil fuel e.g. kerosene for bitumen heating, gasoline (petroleum, gas etc) for vehicles etc. Work and labour force at the campsite will need kerosene, gas in absence of firewood availability for cooking their meals but firewood supply system need to be managed and controlled under transparent and respectful manner by practicing standard agreement format between buyers and suppliers. Contractors fossil fuel need for their vehicles, operating machines used for the works will exert pressure on the local supplies unless a separate mechanism is amicably worked out.

E. Human Resources Requirement

37. The anticipated work force required for the project works are labor, skilled labor and technical staffs. The unskilled labor will be primarily be recruited among local communities, giving due preference to disadvantaged groups and women whenever possible. Considering the design plan and norms for rate analysis, total unskilled workers required are around 360,000 workers days and total skill workers including engineers, overseers, drivers, etc. are around 90,000 workers days.

F. Resources required for the implementation of the Proposal

38. Various resources will be required for construction and improvement of this drainage and road works. The main resources include land, human resources, tools and equipment, stones, boulders, soil, gravel and sand will be collected from source 30 km away from Siddharthanagar. Local transportation such as trucks will be used for this purpose.

1. Total Capital

39. The estimated cost for the improvement and development of storm water drainage and urban road including general items and civil works is recommended NRs.2,383,423,686.24 including price contingencies 5%, physical contingencies 5% and VAT 13%.

2. Working Capital

40. The working capital will be decided after the final bidding procedure is done.

3. Land Area

41. The land area required is the municipal area and the works to be done is maximum rehabilitation and improvements of the existing roads and drains, hence less amount of land is required for this propose.

4. Machinery and tools

42. The machinery and tools that are used at the time of construction and operation stages are as follows: (i) labor intensive tools including wheelbarrow, shovel, iron pan, spade, pick, etc.; and (ii) safety tools including helmet, safety jacket, belt, gloves, boots, safety rope, trolley, and other equipment.

(i) Tractor with trolley
(ii) Trucks
(iii) Excavator
(iv) Dozer
(v) Graders
(vi) Bitumen Boiler Machine
(vii) Loader
(viii) Dump Trucks
(ix) Hauling Scrapers
(x) Pneumatic tyre rollers
(xi) Backhoes
(xii) Tamping Machine
(xiii) Portable Pump
(xiv) Bamboos and rope
(xv) Manhole covers lifting hook and tripod
(xvi) Motorcycle

G. Details of Technology

43. Under proposed drainage and road construction and improvement works, the technology to be used in drainage and road works is of mixed nature, requiring to deploy petty as well as national contractors for civil works (structural installations, drain works etc.) heavy machine operations for cuttings: earth, affected existing structure, etc., laying sub-base and base-course materials over the surface and its levelling as well as handling of pavement materials; heavy compressor for compacting overlaid pavement materials; bitumen spreader

for spraying bitumen over the overlaid base course; and pneumatic compressor for binding tougher overlaid clips with bitumen, resulting to sealed bituminous surface. Crusher plants will also establish according to materials needs at appropriate locations suiting contractor's work schedule. For work of labor nature, local people will be given priority if, when and where their sustained availability is assured to its employed. The work includes civil works, embankment protection and bio-engineering, social development and environmental protection activities. Mechanized as well as labor based technology will be used. Focus will be given on labor based technology and only in difficult sections, mechanized technology will be used. The final output of the project is an all-weather finished metallic surface road with the proper drainage system. The materials to be used in the planned project works are boulder for soling, gabion boxes, sand, stone, bricks, bitumen, reinforcement, wood, hume pipe, aggregate, steel, earth, water, etc.

H. Project Activities

1. Earthwork

(i) Site clearance
(ii) Excavation in roadway, drain and retaining structures
(iii) Construction of roadway and drain in embankment and miscellaneous

2. Drainage and Structures

(i) Supplying and laying, stone masonry for drain and structural works in1:4 cements and mortar
(ii) Supplying and laying, brick masonry for drain and structural works in 1:4 cements and mortar
(iii) Supplying and Laying 12.5mm thick plaster for drain and structural works in 1:4 cements
(iv) Providing, placing, supporting and desuttering of plywood form work in proper line and level
(v) Providing and placing different grades of concrete (M15 and M20)
(vi) Supply, fabrication and assembling of different size of gabion boxes
(vii) Providing and placing of reinforcement bar of high yield for the cause way, cover slab, existing and proposed infrastructures including cutting, placing, binding and fixing
(viii) Providing and placing of reinforcement/ iron steel of high yield for Grating (drain inlet) including placing, binding, fixing and laying
(ix) Providing and placing of footpath, footpath utilities, road utilities
(x) Providing and placing of greenery

3. Road and Pavement

(i) Preparation of subgrade
(ii) Supplying, placing and compacting gravel sub base (passing sieve of 63mm and down) over prepared subgrade according to the designed
(iii) Supplying, providing, laying, spreading, watering, leveling, compaction, and all complete for crusher run base course material grading
(iv) Providing, mixing, laying, compacting, transport and all complete of asphalt concrete pavement
(v) Providing, mixing, laying, compacting, transport and all complete of prime coat

4. Miscellaneous

(i) Dismantling and reconstruction/ relocation of existing infrastructures
(ii) Reinstatement of existing road
(iii) Environment mitigation works and bio-engineering

a. Supply, preparation and planting
b. Traffic management, place traffic sign post, different information board, etc.
c. Drainage outlet management

44. Environment management plan with mitigation measures including air quality, water quality, noise level, occupational health and safety etc. as per instruction of engineer.

IV. DESCRIPTION OF THE ENVIRONMENT

45. The proposed subproject is being implemented at Siddharthanagar municipality. For identifying the related issues and impacts related to the project, the baseline condition of the project area is the most. The baseline conditions of the project area on the basis of physical and chemical, biological, socioeconomic and cultural environmental condition are as follows:

A. Physical Environment

1. Geographical Information

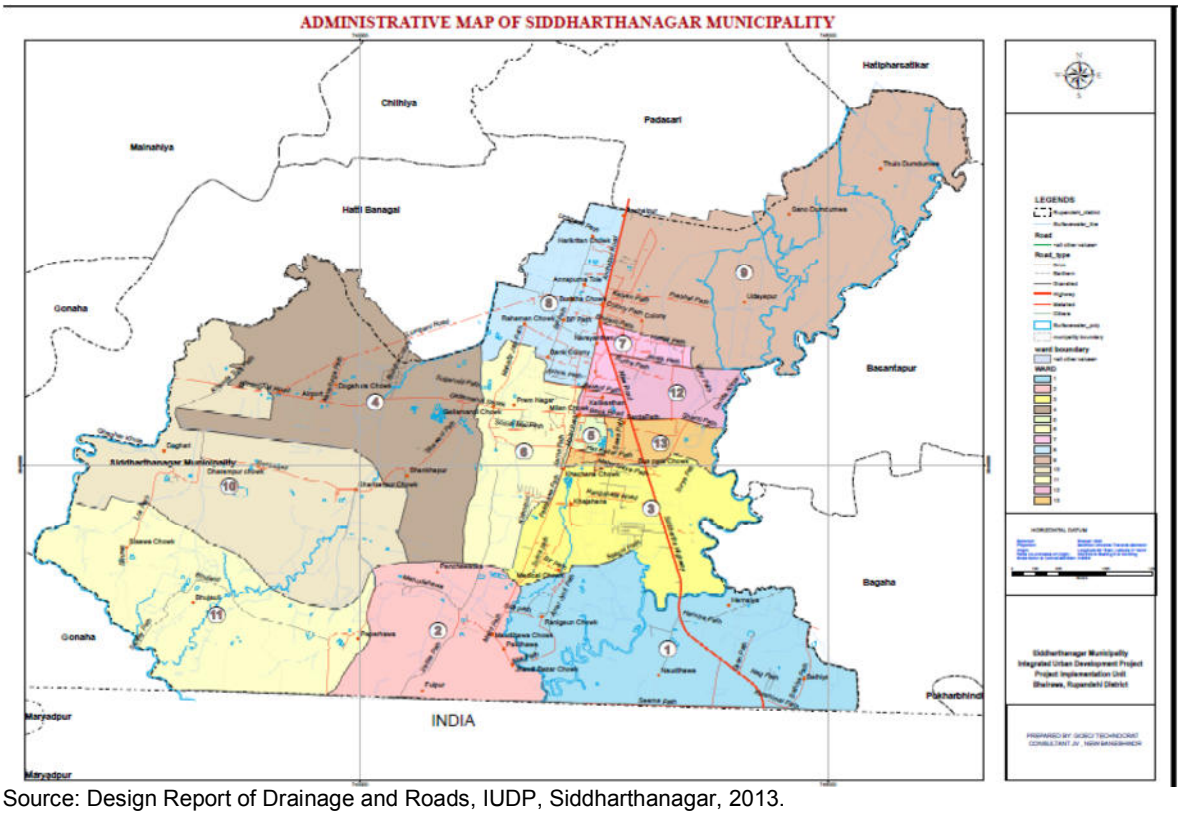
46. The project is located in Siddharthanagar municipality, one of the cities situated in Rupandehi District of Lumbini zone in the Western Development Region of Nepal. It is located approximately 280 km west of Kathmandu by road, is an industrial town as well as an economic center for the Western Development Region. The city is lying at an average altitude of 100 to 109 m above sea level. The municipality lies between latitudes 27° 31' N and longitudes 83°26' E.

47. Siddharthanagar, located on the flat land of Terai, suffers from chronic water-logging problems caused by inadequate capacity of drainage channels due to ad-hoc construction of the drainage system, poor maintenance of drainage facilities, roads and lanes, and aggravated by poor solid waste management (SWM) and dumping of garbage into drains.

2. Maps/ Geography

48. Siddharthanagar municipality is the leading industrial and business center of the Western Terai Region of Nepal. By virtue of its proximity to the Indo-Nepal border, it functions as an outlet for Nepalese exports and an inlet for imports. The municipality is surrounded by Bagaha and Basantapur VDCs in the east, Hati Bangai in the west, Padsari and Pharsatikar VDCs in the north and Sunauli of India in the south. Siddharthanagar municipality covers an area of 36.03 sq. km. and has been divided into 13 wards. However, the ward numbers 5, 6, 7, 8 and 12 are the main core area of the municipality.

Figure 4: Administration Boundary Location (Wardwise)



Source: Design Report of Drainage and Roads, IUDP, Siddharthanagar, 2013.

3. Land Use

49. Siddharthanagar municipality has an area of 3,603 hectares of which 82.3% is covered with agricultural land followed by settlement for domestic and commercial purpose. There is no forest area within the municipality, however, government property and ponds are scattered all over the municipality which needs to be developed in planned way to improve the environment of the area.

Table 12: Land Use Pattern of Catchment Area and Percentage of Coverage

S. N.	Land Use Type	Catchment Area in (Ha)	Coverage Percentage
1	Built Up-1	4.57	0.261%
2	Built Up-2	-	0.000%
3	Built Up-3	84.28	4.808%
4	Built Up-4	269.38	15.367%
5	Built Up-5, Institutional	371.19	21.174%
6	Open Space	39.02	2.226%
7	Bush	1.41	0.080%
8	Cultivation	884.48	50.455%
9	Airport	9.00	0.513%
10	Water Bodies, Pond and River	2.71	0.155%
11	Recreational , Parks etc.	5.54	0.316%
12	Metaled Road	25.72	1.467%
13	Earthen Road	1.70	0.097%
14	Gravel Road	45.70	2.607%
15	PCC, RCC Pavement	0.05	0.003%
16	Brick Pavement	0.07	0.004%

S. N.	Land Use Type	Catchment Area in (Ha)	Coverage Percentage
17	Forest	8.20	0.468%
Total		**1,753.02**	**100.000%**

4. Stormwater drainage

50. Danda Khola and Ghagara Khola are two major natural drainages of the municipality. Storm water and water from other minor drainage are finally disposed into these two rivulets. Danda Khola is in the east and south whereas Ghagara Khola is in the west. In addition to this, there are four other natural drains flowing north-south in the form of water canals. These water courses serve as both canals for providing water to farmlands located at the downstream drains that collect surface run-off from major parts of the city.

51. Siddharthanagar is located in the Terai with flat terrain facing a severe flooding and inundation problem during monsoon season. Over the years, with increasing development of buildings and paved areas, run-off has increased, which has made the drainage situation progressively worse. At present, the sizes of these water courses have been reduced significantly due to encroachment, lack of proper maintenance and dumping of waste in existing drains reducing their capacity to effectively function as drains during the monsoons. Out of these four water courses, one ends at Ghagara Khola in the west of the airport, while the other three end at Danda Khola. The presence of these water courses and rivers at its boundaries is a big advantage to the city in developing the storm water drainage system.

5. Road and Transport

52. Siddharthanagar is connected by the highway from Kathmandu via Narayanghat and Pokhara. It is about 20 km south from Butwal at the junction of east and west (Mahendra Highway) and north and south (Siddhartha Highway). Siddharthanagar has an airport with regular flights to Kathmandu and occasional flights to Pokhara. The airport will soon be upgraded to a regional international airport to augment the passenger capacity. This initiative has been taken to cater to the Buddhist pilgrims visiting Lumbini.

53. Two major highways pass through Siddharthanagar municipality—Siddhartha Highway and Lumbini Highway. The municipality has a good network of roads as compared to other towns. Based on the draft of the periodic plan, as of 2011, total road length within the municipality is 136.50 km. The following are the details of roads in Siddharthanagar municipality:

Road with metallic surface	64.45 km
Graveled road	47.98 km
Earthen road	24.07 km
Total road	136.50 km

54. Lumbini Highway connects this municipality to the birthplace of Siddhartha Gautam, the Buddha. Almost all roads of the inner city are black-topped and are in comparatively good condition. Most of these roads have surface water drains (there are about 27.40 km of road side drains). These are not covered and are full of solid waste. Ongoing project is addressing SWM.

55. The newly expanded area, especially in the north and northwest sector of the municipality, has earthen and graveled roads. The areas which bordered with different VDCs around the municipality also have graveled and earthen roads. The right-of-way (RoW) of the inner city roads ranges from 4 m to 10 m, and that of the outer area varies from 6 m to 16 m. The highways have RoW of 50 m. The condition of the highways is quite good. However, Siddhartha Highway does not have lined side drains, and the ditch is full of solid waste. The

expansion and construction of new flexible pavement is ongoing in the Lumbini Highway; however, the drains are too small for the needs of the city. In the suburban areas of the city, the condition of the roads is not good. Only few of these roads have metallic surfaces. There are no storm water drains in these tertiary roads.

56. Although the municipality has listed many road constructions and improvement works in its periodic plan, they are not the current priority of the municipality. However, the improvement of road surfaces is the next priority after the construction of a whole city level drainage system.

6. Solid Waste Management

57. As a result of rapid urbanization, municipalities of Nepal have been facing a serious SWM problem, putting immense pressure on municipal services. The waste is not being adequately managed, eventually creating serious health and environmental hazards, particularly in slum areas where residents have less capacity to pay for better services. Poor urban settlements are more affected because of more indiscriminate dumping and the lack of open space. With increasing public awareness about good health and a clean environment, SWM has now become the priority of the municipalities.

58. About 31% of the households are disposing waste along the road corridor and 13% are disposing in nearby dustbins. About 28% of the surveyed households are disposing the waste/ garbage in open area, 13% are practicing waste/ garbage burning frequently to dispose certain portions of the total household waste generated, and 10% are disposing waste within their own premises, which is an indication of the space availability for disposal. Only 2% are disposing waste at locations identified by the municipality. About 2% of households are disposing the solid waste in the drains.

59. As per field survey carried out by the design and supervision consultant (DSC), IUDP in 2013, municipal waste generation rate is 0.210kg/ capita/day.

7. Sources of water

60. Siddharthanagar is bound by the Danda River in the south and east and Ghagara River in the west. It uses only groundwater sources for water supply due to its abundance. The available hydro-geological information confirms the existence of vast underground water resources. There are 3 big ponds in the municipality.

61. Groundwater is the only source of water for the town. Before 1981 the water supply system in municipality was operated by Department of Water Supply and Sewerage (DWSS). Since 1981 the system has been operated by Nepal Water Supply Corporation, which consists of 3 deep boring, 2 over head tanks and about 51 km of pipes of various material and sizes. It serves about 38% of the existing population. Households and other customers not connected to NWSC system draw water from private hand pumps (manually drilled tube wells). The municipality installs about 15 hand pumps/ year to serve the poor. Public hand pumps are also installed at many locations. Based on the blanket arsenic testing carried out in Nepal, there are at least 6,380 wells in the municipality.

Table 13: Existing Source of Drinking Water

S. No.	Types of Source	Percentage (%)
1	Pipe	44.19
2	Well	0.13
3	Boring	54.03
4	Rivers	0.1

S. No.	Types of Source	Percentage (%)
5	Others	1.55
	Total	**100**

Source: Municipality Profile, 2010.

Table 14: Existing Situation of Distribution of Drinking Water

S. No.	Description	Total in Number
1	Deep Boring	3
2	Overhead Tank	2 (with capacity of 225000 L and 450000 L)
3	Pipe Line Connected	51 Km
4	Distribution	Total Tap 3142
	Private	3036
	Public	23
	Governmental Office	91
5	Water Distribution Per Day	3.5 MLD
6	Distribution Time	
	Morning	5 AM to 10 AM
	Day	12 PM to 1 PM
	Evening	530 PM to 830 PM

Source: Municipality Profile, 2010.

8. Arrangements made for disposing or processing waste

62. The waste or spoil generated during the drainage and road construction and improvement works will be first segregated as top soil/ productive soil and other spoils. The topsoil/ productive soil will be used at the firm lands and others will be used for the compaction of inner roads/ lanes. Hence, no huge spoils will be left over. The left spoil will be disposed at Swargawari ghat, Dandagaun.

B. Biological Environment[1]

1. Flora and Fauna near and at the Project Area

63. There are some floral and faunal species at the municipal area but no remarkable flora and fauna are harmed or impacted due to the proposed work.

2. Fishes

64. Ghagara River and Danda River are the main water sources for the aquatic lives. Similarly people have their own ponds for fish keeping. The general fishes found in the project area are: Stone Roller (Buduna) (Garra gotyla), Sucker head (Nakatuwa) (Garra annadali), Stone Loach (Noemachelius rupicola) etc.

C. Socioeconomic and Cultural Environment

1. Cultural and Socioeconomic Aspects

65. Siddharthanagar has a diverse culture with people from different faiths living within mixed communities. Hinduism (83%) and Muslim (12%) are two major religions in the city with Hindus comprising larger percentage of the population. Other religions like Buddhism, Sikhs

[1] No rare, endangered or protected species have been identified during site visits and assessments in the subproject area. The biological information is based on secondary data and available literature for a wider area covering the entire region.

and Christianity are among the minorities. Native languages spoken by the people are Nepali, Bhojpuriand Hindi.

66. Siddharthanagar is the gate way to Lumbini for religious tourists. There are many tourist destinations through the way from Siddharthanagar such as Lumbini Garden around Lord Buddha's birthplace, with numerous temples, monasteries, and holy ponds. During the time of Dashain Festival, Hindus establish the Idol or Statue of goddess Durga temporarily. Maghi is one the main festivals of Tharus. The Id, Bakari Id and Moharam are festivals celebrated by Muslims.

2. Population and condition relating to settlements in the area, as well as nearby areas

67. Nepal is one of least urbanized countries in the world however in recent year the urbanization is increasing. From the total of 3.6% urban population, it reached 17% (about 5.5 million people) who resided in the urban area by the end of 2010. Urbanization and growth of urban population is gradually changing the occupational pattern of the community from agriculture to industrial and other non-agriculture occupations.

68. According to the census, the population of Siddharthanagar in 2011 was 63,483 (31,673 males and 31,810 females) with a growth rate of 2.07% per annum whereas population of municipality as per census 2001 was 52569 with a growth rate of 2.91%. The population density according to 2011 census is 18 person/ ha. Most of the people are living with more than 6 family members. The table below shows the population, growth rate and population density in different census year.

Table 15: Population Growth and Density

Population of Different Census Years	1981	1991	2001	2011
Population	31119	39473	52569	63483
Growth, %	-	2.41	2.91	2.07
Density (Person/ ha)	9	11	15	18

Source: CBS, 2011.

Table 16: Population, Household, Density

Wards	Area in Hectare	Households	Population	Male	Female
1	444	1066	5705	2787	2918
2	421	498	3005	1446	1559
3	299	1285	6624	3324	3300
4	395	813	4900	2493	2407
5	18	193	1051	538	513
6	149	1633	9031	4543	4488
7	40	952	3990	2016	1974
8	163	2078	8872	4421	4451
9	639	1352	6868	3396	3472
10	579	467	2932	1495	1437
11	288	335	2387	1204	1183
12	93	886	3967	1972	1995
13	75	939	4151	2038	2113
Total	**3603**	**12497**	**63483**	**31673**	**31810**

Source: CBS, 2011.

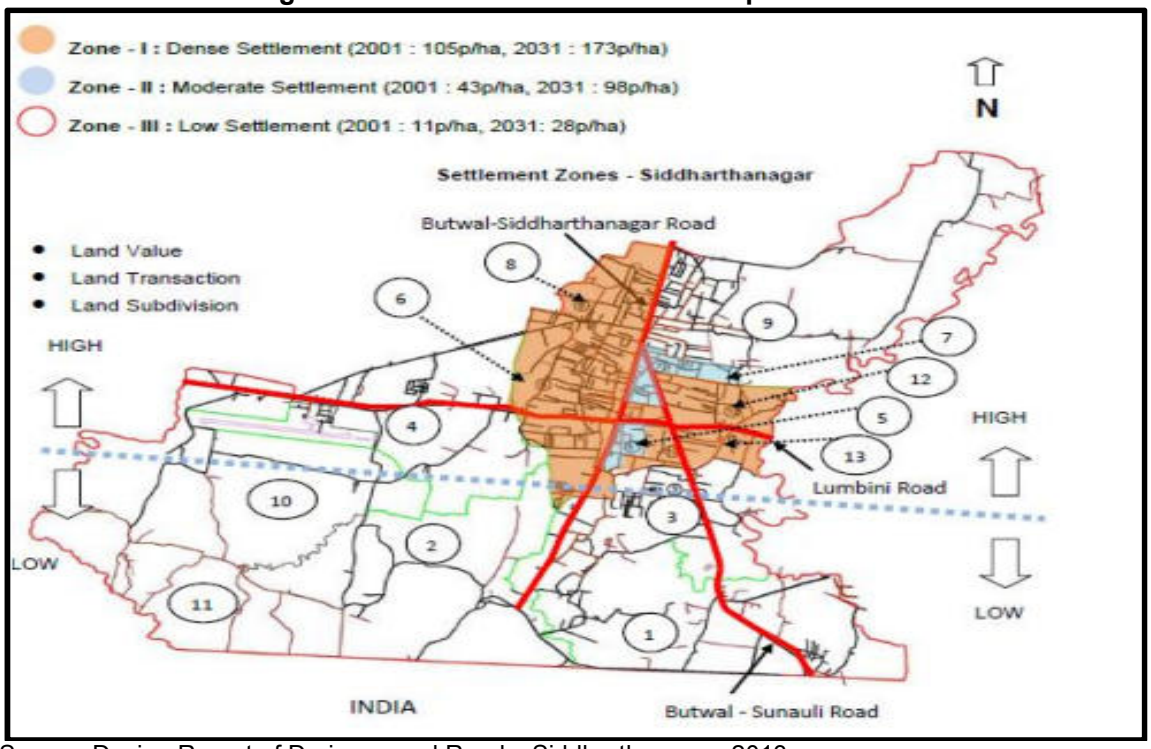
69. Based on the population and density, the municipality can be divided into three settlement zones as described in table below:

Table 17: Municipality Zones

Zone/ Wards	Current Status
Zone – I/ 6, 8, 12, 13	Dense Settlement : along the highway, high land value, main junction to old town, commercial establishments
Zone – II/ 5, 7	Moderate Settlement : West and east of main highway towards the old town (west) and new development (east), bye pass road to airport and Lumbini
Zone – III/ 1 to 4 & 9 to 11	Low Settlement : Fringe areas, still haverural characteristics

Source: PPTA 7727-NEP, 2011 and Field Survey and Municipal Data.

Figure 5: Zonal Division of the Municipal Area



Source: Design Report of Drainage and Roads, Siddharthanagar, 2013

3. Institutional, Commercial and Other Facilities

70. There are sixty-four government and private educational institutions including primary, lower secondary, secondary, higher secondary schools, Motheresa and medical colleges in Siddharthanagar. Bhim Hospital is the government health institution and there are also tww teaching hospitals i.e. Lumbini Ranaambika Shah Eye Hospital and Universal College of Medical Science and other private nursing homes and private clinics.

71. As per public recreational space, there are 2 film halls. There are several temples and masjids in Siddharthanagar. Some of the temples within the municipality are Narayan Temple, Radha Krishna Temple, Karanimai Temple, Kalikasthan Temple, Samayamai Temple, Durga Temple, Pashupati Temple, Basdelya Shivalaya Temple, Bishwokarma Temple, Shanti Buddha Bihar, Kotakai Temple, Shree Hanuman Temple, Pushpa Kriti Bihar, Durga Mandir, Shiva Mandir, Radhakrishna Temple, Kalimai mandir, Ram janaki mandir, Shakti pith, Sunni

Maszid, Jama Maszid, Mohamdiya Jama Maszid, Nava Durga Temple, Baijanath Temple, Shree Durga Mandir, etc. There are about 800 shops, 95 hotels and restaurants The majority of the industries are small scale industries such as rice mills, wood and steel furniture, plywood industry, pharmaceuticals, and metal wire and food products.

4. Paths for movement in the area where the proposal is to be implemented

72. All the roads will not be constructed at a time and at the time of construction of road, in co-ordination with traffic police and local government bodies, alternative routes will be followed.

5. Particulars of any sensitive things or objects, if any, located close to the area where the proposal is to be implemented

73. There are different cultural heritage, airport, ponds etc. in the municipality area. Some of the cultural heritage sites within the municipality are Radha Krishna Mandir, Karani Mai Mandir, Kalika Isthan Mandir Samay Mai Mandir, Durga Mandir etc. Due to the implementation of the proposal, the areas are not directly affected but the activities done at these places are indirectly affected.

Tentative Contractor Camp, Labour Camp, Spoil Disposal Site, and Stock Pilling Locations:

Labour Camps:
1. EPZ Road
2. Bypass Road

Stock Pilling Locations:
1. Danda Crusher Yard
2. Bypass Road

Spoil Disposal Sites
1. Will be used to fill inner city roads
2. Excess will be transported as municipality instructed

V. ANTICIPATED ENVIRONMENTAL IMPACTS

A. Methodology

74. 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 PPTA study and potential impacts.

75. The area of impacts considered is: (i) area occupied by proposed landfill site, and (ii) immediate surroundings of the landfill site facilities (30 m circumference).

76. Categorization of the subproject and formulation of mitigation measures have been guided by ADB's REA Checklist for roads and drainage works and ADB SPS, 2009.

Table 18: Anticipated Impacts for the proposed subproject

Scheme	Expected impacts	Comments
1. Road and Drainage upgrading • widening existing roads • blacktopping • drainage • footpaths along roads • in specific cases possible realignment of road	Will improve the situation in settlement by providing more space for traffic, drainage, increased safety for pedestrians (footpaths), and reduction of problems caused by dust and mud. Main concerns: • land acquisition for widening or realigning roads (if any) • reclaiming of existing, but not used ROW: conflicts with encroachers • impacts during construction	Category B projects, IEE required; small local interventions probably C. Land will have to be acquired according to rules. If squatters or other land users without a title will be affected, compensation will have to be provided according to ADB safeguards principles. Construction will have to be carried out with the aim of minimising nuisances. Any temporary occupation of land, and any damage to land, assets or structures caused by construction activities, will have to be compensated.

B. Environmental Guidelines for Project Selection

77. In order to strengthen urban climate resilience, urban drainage designs will accommodate additional flow caused by more intense rainfall, and key facilities such as water treatment plants, landfill sites, and production tube-wells will be built with freeboard above the highest recorded flood level.

78. The following criteria will be used for excluding subproject sites which might have significant negative environmental impacts:

(i) ecologically sensitive area such as reserved forests critical wetlands etc.; and
(ii) encroachment on cultural features like places of worship, cultural heritage sites, graves/ cemeteries, historical monuments, etc. (no such encroachments are envisaged).

79. Guidelines for project selection in **Table 19** below provide further guidance to avoid or minimize adverse impacts during the identification and finalization of subprojects.

Table 19: Environmental Criteria for Subproject Selection

Environmental Selection Guidelines	Remarks
Overall selection guideline (applicable to all components)	
i. Comply with all requirements of relevant national and local laws, rules, and guidelines.	See Section II of this EARF
ii. Avoid/ minimize where possible locations in protected areas, including notified reserved forests or biodiversity conservation hotspots (wetlands, national reserves, forest reserves, and sanctuaries).	Approval from concerned authority if unavoidable
iii. Avoid possible locations that will result in destruction/ disturbance to historical and cultural places/ values.	Provide for the 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	Approval from Forest Department

Environmental Selection Guidelines	Remarks
any trees have to be removed, plant twenty-five new trees for every one that is lost.	
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 should be documented and concerns expressed by public addressed in IEEs.
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).	Coordinate planning of works with municipality.
Roads Improvement	
i. Include the provision of new or improved storm water drainage to remove the increased runoff caused by increasing the road surface area	
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.	
Drainage improvement	
i. Outfalls should be to suitable drainage areas (canals, etc.) and avoid flooding to adjacent private lands.	
ii. Include measures to ensure the safe disposal of canal dredge (e.g., to dumpsite or landfill) without causing an environmental hazard.	
iii. Include provision for installation of regulator to control inflow/ outflow through drain to prevent backflow of water through drain (e.g., due to high water level at downstream discharge point, such as khal/ river)	
iv. Include measures to avoid pollution of downstream water body due to disposal of polluted water from drain	Do not allow direct connection to drain from sanitation facilities and/or waste water with high organic load. Strictly follow the effluent discharge standard of DOE and consider introduction of small scale treatment of polluted drain water before disposal (if needed)
i. Introduce provision of rooftop rainwater harvesting system for proper storm water management or in case of drinking water scarcity	

C. Climate change adaptation and disaster risk management considerations

80. Siddharthnagar municipality needs to deal with the impacts of climate change that are mainly associated with increased rainfall, rain-driven drainage congestion and urban flash flooding. Inadequate drainage and waste management systems are contributing to localized flooding, drainage congestion, waterlogging and water pollution. The majority of waterlogged areas seem to be in the municipality's newer areas, away from its historic business district. Inadequate drainage and waste management systems are contributing to localized flooding, drainage congestion, water logging and water pollution.

81. Flash flood and waterlogging will be accelerated due to increase of climate change impacts. It is recommended that project design construction, especially design material,

method of construction should be taken appropriate to make the project climate-proof and disaster resilient. During the detailed design, the environment specialist properly consulted with the design team to incorporate this impact. The climate change impact and necessary consideration in design for adaptation is shown in **Table 20**.

Table 20: Climate Change Impact and Design Considerations

Climate change effect/ impact factor	Impact	Design consideration for mitigation
Water level high/ Sea level rise	Inundation of low laying area. Creation of nuisance due to frequent inundation if solid waste landfill and/or secondary transfer station are located on low laying area	Location of the landfill and STS should not be in the low laying area. Build the embankment around the landfill with a height considering highest flood level. Location of landfill should be at least 20m preferably 100m away from river. Tree plantation need on the embankment to create buffer zone.
Salinity	All construction material will be impacted due to salinity: corrosion and dampness	All construction material should saline resistant, anti-saline admixture can be used.
Cyclone and tidal surge	Wind speed will damage structurally to building, damage to plant and vegetation, tidal surge will damage embankment, cyclone may damage landfill operation, may dislocate waste and create naissance.	Structural design should consider cyclone wind speed; wind breaker can be introduced around the building and site. Plant timber trees, proper cross drainages should be provided to the embankment, design should consider height of the storm surge; drain valve can be used at drain outlet to protect backwater flow from drain. Landfill daily cover and compaction should be strictly maintain in daily operation of the landfill
Floods and water logging	Erosion to internal road surface and structural damage to drain and road due to over topping and water logging; ground floor of the building can be flooded due to low plinth building; overflow of sanitation can create nuisance and disease spreading, tube-well can be contaminated due to intrusion of flood water. Nuisance may create due to frequent flooding/ waterlogging if solid waste landfill and/or secondary transfer station are located on flood prone or water logged area	Proper side drainage and cross drainage should be provided to road, road and drain design should consider high flood level, plinth level of building should be raised considering high flood level, toilet and other sanitation structure should constructed on raised ground, tube-well should be also placed raised ground. Location of the landfill and STS should not be in the flood prone/water logging area. Build the embankment around the landfill with a height considering highest flood level.
Lack of drinking water	Effect on water supply, disease can be spread due to drink impure water.	Water supply should consider water demand properly; surface water should be used as water source for treatment plant.
Drought	Impact on plant and vegetation, water scarcity, delay in landfill digestion mechanism due to lake of moisture, load shedding of electricity	Pond should be excavated and re-excavated, Proper electric supply system should be established, solar electric should be used rather than conventional electric supply, more tube-well should be sunk.

Climate change effect/ impact factor	Impact	Design consideration for mitigation
Construction materials' quality		Most durable materials possible, even if higher cost, e.g. concrete, high quality bricks should be chosen; anti saline admixture should be used; Construction quality should be monitored and controlled.
Rising temperatures		Works during most favorable times of year and day should be executed; Preparing, placing and curing concrete and mortar, to ensure placement, etc., during most favorable times should be monitored and controlled; plain high-quality un-rendered brickwork and high quality cement mortar in preference to rendered low-grade bricks should be used; sulphate resisting cement should be used in vulnerable locations (higher heat gain during curing) or cement containing fly ash (less heat gain, so preferred)
Runoff		Trapezoidal section side drains with small low-flow section (cunette) for low flows should be used. Side drains should be lined to achieve higher discharge velocities without increasing risk of scour, etc.

D. Pre-Construction Phase

1. Land acquisition and land use change and resettlement

82. Siddharthanagar Municipality has an area of 3,603 hectares of which 82.29 % area is covered with agricultural land followed by settlement for residential and commercial purpose. There is no forest area within the Municipality. However, government property and ponds are scattered all over the Municipality which needs to be developed in a planned way to improve the environment of the area.

E. Construction Phase Impacts

83. 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 area designated by Siddharthnagar municipality will not cause direct impact on biodiversity values.

1. Impact due to operation of quarries and borrow pits

84. Construction of the road requires boulders and other types of construction materials. The extraction of materials from inappropriate places or in excessive amounts can damage the local environment. The potential adverse impacts of quarrying are accelerated erosion, noise, dust etc. Rainwater will also create problem around quarry site. Quarrying of

construction materials will change the morphology of the rivers and scar the environment (when sand mining from borrows pits) due to improper mining.

85. As per contract document and limited availability of the construction materials, the contractor can bring materials from up to 52 km from the municipality and hence no quarry site is fixed.

2. Impact due to excess spoil and disposal

86. The spoil generated due to proposed work will be used for the filling of the inner city roads, but in proper disposal of the excess spoil will create many problems to the surrounding area. There will be air, dust pollution, drinking water sources will be polluted, and traffic congestion will be the major problem. Similarly, at the time of transportation and disposal of the spoil, the will be air, water, dust pollution and nuisance to the surrounding area will occur.

3. Temporary and permanent disruption to the public utilities, reinstatement and relocation of the existing services: electric poles cables, water supply pipelines, telephone line, irrigation canal

87. Construction and improvement works of the drains and roads will lead to the temporary and permanent disruption to the public utilities. The construction and improvement of the roads and drains work is going to affect certain drinking water supply pipes, electrical poles and cables, humepipe and culverts which will have to be rehabilitated.

4. Use of bitumen and their storage, heating and spreading

88. Bitumen, which is to be used in sealing of proposed road upgrading, is highly combustible and risky of fire hazards unless it is kept away from the fire igniting source as well as from the public. Hence its storage prior to usage in sealing works is of key concern during road sealing works, and need to be of adequately safe in storage. Bitumen can have adverse impact while heating and spreading.

5. Use of fuel, lubricants, oil, acids and other chemicals for construction (vehicles, plants and equipment) and their storage

89. Putting mechanical workshop, gas station, etc. into operational at contractor's camp in order to ensure upkeep of all vehicles, operating machines including heavy ones deployed in proposed road upgrading requires use of substantial quantity of lubricants, vehicles refueling etc. to keeping it in functional upkeep works, refueling, etc. also generates some wastes and spillage. Acids used in battery recharging, other chemicals etc. used at workshop are other types of workshop wastes. Fossil fuel is also required in operating crushed plant on road site where power supply is not available.

90. While its safe storage and usage is required and ensured, workshops wastes are potential source of environmental hazards unless it is handled correctly. Impact is direct, of high magnitude, local and long term in nature.

6. Possible impacts on public important, religious and cultural sites

91. Some cultural, religious, public important and archaeological sites observed near the drainage and road alignment are affected, as Siddharthanagar is one of the places of different religious community and culture. Nuisance to the public, important religious and social/ cultural sites like Durga Temple, B P pustakalaya etc. due to generation of noise and vibrations and power horns and access due to excavations and vehicle movements.

7. Impacts associated with Construction Camps

92. Proposed drainage and road upgrading requires establishment of a number of camp sites for labor and workforce at various locations depending on contractor's work schedule and proximity of work activity. Campsites used by these forces become a source of disturbance to local people. Earth excavation, construction materials and stockpiling, and plying of vehicles will produce dust (TSP, PM10), hydrocarbons (CO, CO2, CH4), SO2, NOX, H2S, etc., noise, and vibrations, which create nuisances to the public, important social/ cultural sites, and schools. Plying of trucks on nonmetallic roads will produce huge amounts of dust, thereby causing the air quality to deteriorate and increasing noise levels to above 90 dB, affecting health. If not managed properly, labor camps can create great impact. There will be problems associated with solid waste management, noise pollution, drinking water supply, and extraction on nearby forest resources, etc. This impact is direct, medium magnitude, short term and site specific in nature.

8. Pressure on social service facilities and traffic congestion

93. Labor and workforce deployed in proposed drainage and road construction and improvement works requires usage of public utilities on the work site as their daily livings. Their need exerts pressure and competes on existing essential services available in limited capacity. These services includes telephone, water supply, solid waste management, health services, transportation, school, etc., which will surplus its carrying capacity if its existing magnitude is not temporarily upgraded to suit and cater additional needs. Traffic congestion and temporary disruption to local access is due to open trenches, excavation across roads, or road closures due to construction could have impacts on pedestrians, vehicles, and businesses. During construction, though the route is diverted to another route during the construction and improvement works, the flow of traffic in the construction area and other secondary route leads to the traffic congestion. This impact is indirect, medium magnitude, short term and site specific in nature.

9. Public health hazards

94. Labor forces health risk is commonly associated with the poor camp conditions. Use of unsafe water supply sources, poor sanitation conditions (lack of latrines, washing facilities, solid waste management etc.) also cause the risk of epidemic diseases including dysentery, diarrhea, cholera, etc. Public health risks associated with the project areas construction works and the environment with noise emission, dust production and bad smell of the drainage works. Properly unclosed borrow pits also cause the risks of spreading water-borne diseases including malaria, dengue fever etc. Contagious diseases like HIV/AIDS, STDs, etc. will surface up conspicuously and spread over extensively as any one-local and in-migrant labor force infected with diseases- becomes sexually active. Impact is indirect, medium magnitude, site specific and short term in nature.

10. Occupational health and Safety

95. As a labor force requires undertaking works especially in hazardous materials handling, heavy equipment operations, etc., they are exposed to various safety risks and health hazards if and when these works were done without adequate safety measures. Other potential impacts to health are respiratory and eye disease due to exposure to dust. Health risk is also commonly associated with the poor labor camp conditions, use of unsafe water supply sources. Poor sanitation condition (lack of latrines and washing facilities) also causes the risk of epidemic diseases that includes dysentery, diarrhea, cholera etc.

96. Properly unclosed borrow pits also cause the risks of spreading water-borne diseases including malaria, dengue fever. Contagious diseases like HIV/AIDS, STDs, etc. will surface up conspicuously and spread over extensively as any one-local and in-migrant labor force infected with diseases- becomes sexually active.

97. Impact is indirect, medium magnitude, site specific and short term in nature.

11. Impacts due to dust

98. During the construction phase, there will be emission of dusts. This will be temporary intense along the construction sites. Dust will also affect the road side vegetation, structures and the pedestrian using the constructed route. During construction, the activities and movement of vehicles will slightly increase the noise level due to the nature of work which directly or indirectly affects the road users as well as the local residential areas. The impact will be indirect, medium magnitude, site-specific and short term in nature.

12. Degradation of air quality (particularly dust) and increase in dust/ suspended particulate matter

99. At the construction phase, there will be emission of dusts. This will be temporary intense along the construction sites. Dust will also affect the road side vegetation and structures. These pollution has the potential impacts to health are respiratory and eye disease due to exposure to dust. The impact will be indirect, medium magnitude, site-specific and short term in nature.

13. Rise in noise level and vibration due to construction work

100. During construction, the construction activities and movement of vehicles will slightly increase noise level and vibration due to the nature of work which directly or indirectly affects the road users as well as the local residential areas. The impact will be indirect, medium magnitude, site-specific and short term in nature.

14. Landscape disturbance and Change in land use

101. Due to construction and improvement of the existing drainage and road, some parts of agricultural and settlement area will be converted into road and barren land which affect agricultural products and settlement area. No forest[2] area will be additionally occupied by the upgrading works of the existing road is not remarkable as the road already exists. Since there is no big or large cuttings which would effect on landscape, impact on landscape disturbance is not identified as significant impact of the project construction. Impact is direct, of medium magnitude, local, and long term in nature.

15. Risk of industrial and other wastes directly discharged to the drain

102. At present, the discharge of the industrial waste and other waste directly into the drains are creating a nuisance to the surroundings and present health hazards to the public, workers and also affect the aquatic life. People of the local residential areas and the neighboring areas are mostly affected due to the unwanted bad odor smell of the waste water. Due to construction works, there will be damage of waste pipes and the whole environment will be polluted. The waste water in such drainage contains various types of untreated organic and inorganic toxic materials. Such waste water leads to the formation of different toxic gases such

[2] The forest area mentioned is not legally-protected as per GoN requirements. Any required permit or clearance will be obtained prior to start of works.

as hydrogen sulphide, sulphur dioxide, etc. and also will be the favorable place for the survival of insects and rodents like mosquito and others. Such polluted environment causes the risks of spreading water-borne diseases including malaria, dengue fever, etc. in the local as well as neighboring areas.

F. Operation and Maintenance Phase impacts

1. Embankment erosion due to outlet of storm water drainage

103. Upon the operation and maintenance phase of drains, the drain gets clogged due to sedimentation or due to heavy flood. The embankment becomes very weak due to the seepage of waste water, rain water, and others. With this storm water drainage discharge phenomenon of outlet at danda nala, Ghanghara nala, it becomes a source of occasional environmental threat to downstream residents as well as impairing downstream water sources. It will also cause erosion of embankment and erosion of downstream agricultural land and will enhance gully formations and slides too. This situation will need assessment of such threat, requiring correction measures. It will also require periodic clean-up of choked drains. The impact is direct, of medium magnitude, site specific, and medium term in nature.

2. Pollution of ground and river water due to seepage of waste water

104. The long term operation of the drains of Siddharthanagar receives the seasonal storm water during monsoon. The waste water from municipal households, industrial waste, and etc. will pollute the ground water and river of the existing area due to seepage of waste water through the drains. Similarly, run-off from road surface will cause water pollution. The disposal of spoils and other construction materials and waste into water bodies will also degrade the water quality. This impact is indirect, medium magnitude, short term, and site specific in nature.

3. Removal and disposal of sludge

105. During the operational phase, some parts of drain will be clogged. Due to this, the water in the drain remains in still condition which leads to the emission of different toxic gases. Removal and disposal of sludge without any treatment leads to the nuisance to the public and also pollutes the river water, soil and disturbs the aquatic life too. Open dumping of waste, including in and around the landfill site will cause the nuisance to workers, local people due to emissions of methane gas from landfill site. During the removal of waste from municipality, nuisance due to waste collection remains and waste spillage during transportation is occurred. Impact is direct, low magnitude, local and long term in nature.

4. Formation of different toxic gases due to blockage of the drain

106. During the operation stage, sometimes due to inadequate size of drain, no proper outlets of drainage system will cause the blockage of drain which leads to the formation of different toxic gases such as hydrogen sulphide, methane, and others. These gases spreading in environment of the project area will leads to the sore throat, cough shortness of breath, irritation of the eyes, nose and throat etc.

5. Aquatic life hazard due to mixing of drain at the water sources

107. The direct mixing of drainage water into the Rohini, Ghanghara Rivers during the construction and even after construction, washing of vehicles in rivers and streams will degrades the water quality of the rivers. In such case, the river water will be polluted affecting the aquatic habitats. Spillage of chemicals and oil in water bodies can also impact on fish and other aquatic life.

6. Risk of health and safety hazards to workers from hazardous materials which may be contained in waste water

108. During operation and maintenance of drainage works, the removal of the accumulated water and sludge from the drains could be a nuisance to the surroundings and pose health hazards to the public and the workers. People of the local residential areas are mostly affected due to the unwanted bad dour smell of the waste water. The existing environment of whole local area will be polluted. The waste water in such drainage contains various types of untreated organic and inorganic toxic materials. The workers involved in such maintenance work of drainage without proper safety measures have high risk to their health.

7. Blockage of drainage and nuisance to neighbouring areas due to overflow and flooding

109. The size of drain will be adequately big and will be made for complete outflow. If not, and at heavy rain during monsoon, there will be the blockage and overflow of such water in municipal area and leads to flooding and nuisance to the local areas and neighboring areas, large areas of the municipality will get inundated during the monsoons, and a large section of the population will be forced to remain inside their houses for weeks, adversely affecting their daily activities and access to food and safe drinking water.

8. Nuisance to neighbouring areas due to odour, insects, and rodent

110. During operation and maintenance of drainage works, the removal of the accumulated water and sludge from the drains could be a nuisance to the surroundings and pose health hazards to the public and the workers. People of the local residential areas and the neighboring areas are mostly affected due to the unwanted bad odor smell of the waste water. The existing environment of whole local area will be polluted. The waste water in such drainage contains various types of untreated organic and inorganic toxic materials. Such waste water creates the favorable environment for the survival of insects and rodents like mosquitos and others. Such polluted environment causes the risks of spreading water-borne diseases including malaria, dengue fever etc. in the local as well as neighboring areas.

Table 21: Affected Community Resources under RUDP Road

S.N	Name of Road	Chainage		Length	Quantity
		From	To		
1. Electric Pole					
1	Maitri Path	0+000	2+675.81	2675.81	95
2	Children's Park Road	0+000	1+841.03	1841.03	40
3	Udayapur Road	0+000	1+943.75	1943.75	36
4	Khajhana Road	0+000	0+920.00	920.00	20
5	Inner city Road Stretches				
i	Narayan Path	0+000	1+046.20	1046.20	20
ii	Gallamandi	0+000	1+000.00	1000	43
iii	Janak Path	0+000	0+898.80	898.80	30
	Total			**10325.39**	**284**
2. Telephone Pole					
1	Maitri Path	0+000	2+675.81	2675.81	60
2	Children's Park Road	0+000	1+841.03	1841.03	15
3	Udayapur Road	0+000	1+943.75	1943.75	2
4	Khajhana Road	0+000	0+920.00	920.00	3
5	Inner city Road Stretches				
i	Narayan Path	0+000	1+046.20	1046.20	1
ii	Gallamandi	0+000	1+000.00	1000	30

S.N	Name of Road	Chainage		Length	Quantity
		From	To		
iii	Janak Path	0+000	0+898.80	898.80	6
				10325.39	**117**
			3. Hume Pipe		
1	Maitri Path	0+000	2+675.81	2675.81	
2	Children's Park Road	0+000	1+841.03	1841.03	18
3	Udayapur Road	0+000	1+943.75	1943.75	20
4	Khajhana Road	0+000	0+920.00	920.00	3
5	Inner city Road Stretches				
i	Narayan Path	0+000	1+046.20	1046.20	
ii	Gallamandi	0+000	1+000.00	1000	4
iii	Janak Path	0+000	0+898.80	898.80	
	Total			**10325.39**	**45**
			4. Transformer		
1	Maitri Path	0+000	2+675.81	2675.81	2
2	Children's Park Road	0+000	1+841.03	1841.03	
3	Udayapur Road	0+000	1+943.75	1943.75	
4	Khajhana Road	0+000	0+920.00	920.00	
5	Inner city Road Stretches				
i	Narayan Path	0+000	1+046.20	1046.20	2
ii	Gallamandi	0+000	1+000.00	1000	1
iii	Janak Path	0+000	0+898.80	898.80	
	Total			**10325.39**	**5**
5. Culvert					
1	Maitri Path	0+000	2+675.81	2675.81	2
2	Children's Park Road	0+000	1+841.03	1841.03	
3	Udayapur Road	0+000	1+943.75	1943.75	
4	Khajhana Road	0+000	0+920.00	920.00	
5	Inner city Road Stretches				
i	Narayan Path	0+000	1+046.20	1046.20	
ii	Gallamandi	0+000	1+000.00	1000	
iii	Janak Path	0+000	0+898.80	898.80	
	Total			**10325.39**	**2**

Source: Detail Design Report 2016.

Table 22: Affected Community Resources under RUDP Roads

S.N	Name of road	Length	Existing Electric pole	Slab Culvert
1	Bimanghat Road (Laxmi path culvert-Mayadevi path)	2465.42	71	2
2	Haatbazaar Path (Maitri Path-Siddhartha Highway)	788.71	24	1
3	Binayak Path (Haatbazaar-Darshan kalyan samaj-JBKN Nala)	167.91	6	
4	Himali Path (Siddhartha Highway-Udaypur Road)	816.49	24	2
5	Janata Path (Shanti Path-Janak Path)	588.31	18	
6	Rudra Path (siddhartha Highway-Janta Path)	669.46	20	

S.N	Name of road	Length	Existing Electric pole	Slab Culvert
7	Karna Path (Gallamandi road-Maitri Path (Nirvana Hotel))	665.87	20	
8	Jyoti Path (Siddhartha Highway-Shanti Path)	653.61	20	4
9	Sewa Path (Bank Road-Haatbazaar Path)	451.07	14	
10	Gallamandi to Durga Coloni Road	1467.67	43	3
11	Shiva Path (Narayan Path-BP Path)	473.74	15	
12	Sakuni Path (Siddhartha Highway-UCMS Medical College-Bir Path)	1524.82	45	2
13	Basant Path (Aawa Road) (Narayan Path-Siddhartha Highway)	396.84	12	
14	Brihaspati Road (Pravat Path-Dumdumuwa Road)	912.41	27	
15	Dumdumuwa Road (Siddhartha Highway-Goligad Chowk-Sano Dumdumuwa Gau)	2000	58	5
16	Kailash Path (Narayan Path-BP Path)	381.11	12	
17	Bhairahawa gau path (Aawa Road-Siddhartha Highway)	508.98	16	
18	Karnimai Path (Maitri Path-CDO Office-Haatbazaar Path)	219.66	7	
19	Karnimai Path (CDO Road-PIU Office-Karnimai Temple)	64.34	3	
20	Kalika Path (Narayan Path-Kalika Path)	184.65	6	1
21	Sahid Path (Narayan Path-Kandu basiya Dharamsala-Children Park)	934.92	28	
22	Stadium Road (Siddhartha Highway-Durga Path)	1031.72	30	2
23	Gonahiya Road (Udaypur-Gonahiya Gau)	1160	34	2
24	Gonahiya Road (Gonahiya Gau-Auto Village)	377.05	12	
25	Bank Road (Milan Chowk-Devkota Chowk)	530.36	16	
26	Dev path (Narayan Path-Shiva Path)	480.33	15	
27	Nagarpalika path (Bank Road-Maitri Path)	178.64	6	
28	Pawan mistwand road (Maitri Path-Nagarpalika Path)	62.03	3	
29	Shanti path (Narayan Path-Dev Path)	137.62	5	
30	Bank Coloni Road (Up to Dev path from Narayan Path)	125.86	5	
31	Navadurga path (Bimanghat Road-Lumbini Road)	528.69	16	1

S.N	Name of road	Length	Existing Electric pole	Slab Culvert
32	Kotaimai path (Siddharth Highway-Kotaimai Temple-Madarsa)	1306.71	38	
33	Aadhiyat Path (Shanti Path-Buspark-Siddhartha Highway)	729.2	22	1
34	Sima Path (Maudihawa Chowk-Sima Culvert)	960	28	1
35	Pravat Path (Siddhartha Highway-Ward Office-9)	597.77	18	
	Total	24541.97	**737**	**30**

Source: Detail Design Report 2016.

111. **Positive impacts due to increase in employment opportunities for local people.** The project will generate direct employment opportunities for the local people of the area. As the project involves construction work, it will offer a grand opportunity for various skilled and non- skilled work forces. The amount of money earned by the local people will directly affect the local economy thereby reducing the chances of seasonal migration of the local people. The project will provide short-term, direct employment benefits to majority of the construction workers and even long-term employment to few workers during the operation of the project. In order to augment such benefits, priority will be given to employ local laborers as far as possible.

112. **Positive impact due to increased economic activities.** The project requires large quantities of different type of construction materials which shall be brought from the local market. The cement mixer, wheel barrow, pulley etc. shall also be hired from local market. The worker shall also buy their daily consumable goods from the local grocery and have breakfast, lunch, tea and snacks in local restaurants and tea shops. Thus, the local businessman and suppliers shall benefit from this opportunity. The magnitude of the impact shall be high, and local and short term impact are also very significant.

9. Enhancement of beneficial impacts

113. Beneficial impacts due to the rehabilitation and construction of the road has been assessed by the study team in terms of impacts on physical, biological, soci-economic and cultural systems of the project area. The impacts have also been assessed in the category of extent, duration and magnitude. Based on the identification and prediction of the impacts, the suitable enhancement measures to maximize the project benefits has been explored and designed.

10. Reduced flooding problem

114. Workers will be given a technical training of the municipality waste management and supervision staff on maintenance of drainage, composting, recycling, and SWM, and in the operation and maintenance of the landfill and septage treatment plant, including the sludge drying beds. These skills will not only benefits the local people by reducing the flooding problems and providing long-term employment opportunities, but also contribute to local human resource development. This will help them to find jobs as skilled workers in other future projects as an alternative occupation to agriculture and tourism.

11. Smooth traffic flow due to widening of road

115. The project will compensate or reinstate/ relocate community assets that are disturbed, such as irrigation canals, electricity poles, telephone lines, drinking water pipes, roads, etc. to the satisfaction of the people. Local people are involved in road widening works for the smooth traffic flow as the project will employ the local unskilled labors with emphasis on road influence area while pursuing a labor-based technology.

12. Employment opportunity and Increase of Income

116. The project will employ local unskilled labors with emphasis on road influence area while pursuing a labor-based technology. The project will employ particularly local people as well as women without gender discrimination. This will increase not only their economy but also contribute to skill development during the lean agriculture season.

13. Increase in health and hygiene of the people reducing the risk of adverse environmental impacts associated with establishment of basic drainage facility and improved road condition

117. Workers will be given training and awareness programs in health and sanitation, occupational health and safety measures (OHS), community health and safety, and solid waste management (source separation including proper storage and delivery to the solid waste collection service, introduction of the 3R concept or reduce, reuse, and recycle) to the general public. These training and awareness will not only benefit the local workers, but also contribute to the increase in health and hygiene of the people reducing the risk of adverse environmental impacts associated with the establishment of the basic drainage facility and improved road condition.

14. Increased beauty of the municipality

118. The project will help to enhance this beneficial impact by generating awareness to the people about the ways of enhancing for the activities like provision of separate footpath, proper road marking, road side greenery, proper drainage, and proper drainage and road maintenance. Awareness raising programs will be conducted in collaboration with concerned stakeholders to increase the beauty of the municipality. Support will be provided to local entrepreneurs, promotion of cooperatives and linkage with concerned institutions along with support on sewerage and other drainage facilities in the market centers.

G. Cumulative Impact Assessment

119. 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.

120. The project has identified the valued components as water quality, 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 boundaries of the subproject are the areas where the facilities (transfer stations, composting plant, and controlled landfill) are located. The temporal boundary can be considered as the whole Dhangadhi sub-metropolitan.

121. **Water quality**. Due to nature of the subproject there is risk of contaminating nearby bodies of water during construction phase. Improved drains within will also ensure wastewater will be diverted away from any channel leading to agricultural lands, water bodies, and water sources/tube wells. Short-term negative impacts are possible but can be mitigated through design and implementation of EMP. Potential residual effects is considered to be negligible.

122. **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 SLF. 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.

123. **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.

124. **Socioeconomic and socio-community**. Concerns on existing provisions for pedestrians, other forms of transport, and overall impact on livability particularly with access restrictions due to construction will occur temporarily. Traffic movement will be improved once the construction activities are completed. Since the subproject involves small-scale facilities, it will not conflict with existing or planned land use. O&M manuals for the facilities, comprehensive capacity building, and community involvement to be provided under RUDP will ensure efficient operation of the facilities and acceptability by the stakeholders. However, following improvements in infrastructure and services, added residential developments, commercial, and business facilities and increased densities are expected to develop and enhance Siddharthnagar municipality. This can be considered a long-term cumulative benefit of the subproject.

125. Given the scale of the project it is likely that a number of local people will obtain at least temporary socioeconomic benefits, by gaining employment in the construction workforce, and thus raising their levels of income. In addition, a significant amount of employments will be generated associated with the O&M of the facilities to be developed under the subprojects. These benefits can bring wider social gains if they are directed at vulnerable[3] groups.

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

126. **Community and worker's 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.

127. Upon completion of the subproject, the community will be the major beneficiaries of this subproject. With the improved solid waste management facilities, additional vehicles and workers PPE, they will be provided with reliable and climate-resilient municipal services. In addition to improved environmental conditions, the subproject will reduce occurrence of diseases and people would spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health. These are considered a long-term cumulative benefit.

128. 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 municipality, will not cause direct impact on biodiversity values.

H. Greenhouse Gas Emissions (GHG)

129. The subproject construction and operation will not lead to any significant emissions of Green House Gases except for small emissions during the use of bitumen for road construction and diesel operated equipment. Improved traffic conditions after the subproject will lead to reduction in average fuel consumption and in turn GHG emissions.

VI. ALTERNATIVES FOR IMPLEMENTATION OF THE PROPOSAL, ALTERNATIVE ANALYSIS

130. The scope of proposed project is to construction and improvement of the existing road to black topped standard and drains to stone/ brick masonry standards. The proposed upgrading and construction would entail and implemented all mitigation measures aiming to avert and or minimize adverse impacts associated with the drainage and road construction. Since, the proposed project is the construction and improvement works of the existing roads and drains but as the aim of alternative analysis is to arrive at a development option, which maximizes the benefits while minimizing the unwanted impacts. The study team will discuss the alternative analysis considering the following sub sections:

A. Design

131. As the subproject is improvement and construction of existing roads and drainages, its alternative analysis is not essential, irrelevant, not requiring. At the time of construction and supervision, if needed alternative design will be done.

B. Project Site (Route)

132. As the proposed improvement and construction works are to follow the existing roads and drainage, alternative route is irrelevant but requiring its improvement in surface condition to sealed bituminous standards with adequately drainage system and related components addressed in line with upgrading salient features. It aims to avoid and practice unnecessary vegetation removal (including trees) along the alignment unless it restricts sight on a road

stretch during construction phase and its removal or clearance is the need of the site situation only.

C. Process, Time Schedule

133. For this construction and improvement works of drainage and road, construction approach will favor a option of a combination of mechanical and labor as it suits in view of respect need to approved road, drain design (including construction specifications) and labor as and where available and willing to. No rigidity to any norms, e.g. local labor will favor to practice during constructions.

134. As the construction and improvement works of drainage and road requires its completion within the stipulated time, suitable work schedule requires matching resource (manpower, materials etc.) availability, weather seasons, type of works to be undertaken etc. so that upgrading is completed within the schedule, and no significant environmental impairment is to cause by construction and improvement activities undertaken. Accordingly this schedule however entails and anticipates avoiding foreseeable environmental impacts.

D. Raw Materials (Resources) To Be Used

135. Drainage and road construction and improvement work requires a diverse type of raw materials-natural (locally available boulders, earth, sand, rock, etc.) and market sourced (e.g. brick, cement, steel, bitumen, gabion etc.) during construction and improvement works of the drainage and road.

E. No Action Alternative

136. In the event of drainage and road upgrading and construction not being undertaken, existing drainage and road conditions-drainage and road blockage in wet season, rough road surface, occasional fatalities associated with the road accidents , flooding, air pollution due to bad smell from the drains etc. remain to continue, and thus affecting road transportation serviceability, requiring road users to suffer in respect of travel hours as well as denial of access to better social services linked up with road quality, and remain the local stakeholder in isolation from the other parts of the country.

Table 23: Evaluations of Environmental Impacts and Benefit Augmentation/ Mitigation Measures

Impacts	Positive Impacts and Related Measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
Reduced flooding problem	Workers will be given on the technical training of the municipality waste management and supervision staff on maintenance of drainage, composting, recycling, and solid waste management, and in the operation and maintenance of the landfill and septage treatment plant, including the sludge drying beds, which will enhance their skills and capability in works in other future projects as an alternative occupation to agriculture and tourism.	Indirect	M (20)	Lc (20)	St(5)	Significant (45)
Smooth traffic flow due to widening of road	Project will reinstate/ relocate community assets that are disturbed to the satisfaction of the people. Involvement of local unskilled labours with emphasis on road influence area while pursuing a labour-based technology.	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Employment opportunity and Increase of Income	Involvement of women, dalits and ethnic minority peoples.	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Increase in health and hygiene of the people reducing the risk of adverse environmental impacts associated with establishment of basic drainage facility and improved road condition	Workers will be given training and awareness programs in health and sanitation, occupational health and safety measures (OHS), community health and safety, and solid waste management (source separation including proper storage and delivery to the solid waste collection service, introduction of the 3R concept or reduce, reuse, and recycle) to the general public. These training and awareness will not only benefits the local workers, but also contribute to increase in health and hygiene of the people reducing the risk of adverse environmental impacts associated with the establishment of the basic drainage facility and improved road condition.	Indirect	M (20)	Lc (20)	St (05)	Significant (45)
Increased beauty of the municipality	The project will help to enhance this beneficial impact by generating awareness to the people about the ways of enhancing for the activities like Provision of separate footpath, proper road marking, road side greenery, proper drainage, and road maintenance. Awareness raising programmes will be conducted in collaboration with concerned stakeholders to increase the	Indirect	M (20)	Lc (20)	Mt (10)	Significant (50)

Impacts	Positive Impacts and Related Measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
	beauty of the municipality. Support will be provided to local entrepreneurs, promotion of cooperatives and linkage with concerned institutions along with support on sewerage and other drainage facilities in the market centers.					

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
Adverse Impacts and Mitigation Measures						
Physical Environment						
Construction Phase						
Operation of Quarry site	Unstable sites, erosion prone areas, dense forest areas, settlements and fertile farm land will be avoided for quarrying operation. After the extraction is completed, the quarry site will be rehabilitated to suit the local landscape. Blasting will not be done for quarrying.	Indirect	L (10)	Lc (20)	St (5)	Insignificant (35)
Excess spoil Disposal	At the time of extraction of spoil, traffic diversion will be done, Excess spoil will be used to fill inner city roads.The reaming spoils will be transported to Swargawari ghat, Dandagaun so as to reduce nuisance to the surrounding area, At the time of transportation of spoil, covering of the trucks and tractors will be done.					
Temporary and permanent disruption and reinstallment and relocation of the public utilities like: electric poles, cables, water supply pipelines, telephone line	After obtaining permission from relevant authorities, they will be reinstalled and relocated; people will be informed and notified for relocation and restoration of utilities as soon as possible to overcome public inconvenience to the satisfaction of the people.	Direct	M (20)	Ss (10)	St (05)	Insignificant (35)

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
Degradation of air quality (particularly dust) and increase in dust/ suspended particulate matter	Transportation of required construction materials (aggregates and sand) when and as required by avoiding temporary storage, use of tarpaulins, plastic sheets, and jute bags to cover the de-silted material during transport, dust suppression on surroundings by sprinkling water as required at regular intervals, routine monitoring of dust (TSP, PM10) to meet air quality standards, plantation of local species along the road side , complete ban of burning of solid wastes and provision of LPG/ Kerosene to workers will be done.	direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Rise in Noise level and vibration due to construction work	Provide information to the public about the work schedule, monitor noise levels regularly at site to meet the noise standards, fit mufflers on vehicles to control noise, limit the speed of vehicles, regular maintenance of equipment and vehicles, prohibit the operation of plants and construction vehicles between 7 p.m. and 6 a.m. in residential areas, compensate the damages caused by vibration to structures if caused by construction activities, avoid working at sensitive times (during religious festivals in the area)	direct	M (20)	Ss (20)	St (5)	insignificant (35)
Landscape disturbance and Change in land use	Borrow pits will be levelled so as to suit the aesthetics of the area and restored to its original state after the project is complete, bioengineering and plantation along the road side for maintaining greenery. Compensation to the loss of land as per Land Acquisition Act, 2034 BS by the formation of Compensation Fixation Committee.	Indirect	M (20)	Ss (10)	St (5)	insignificant (35)
Risk of Industrial and other wastes directly discharged to the drain	Regular monitoring and preventing the entry of direct wastewater from industry into drains by enforcing strict regulations, avoiding the manual de-silting and avoiding working at rainy season	Indirect	M (20)	Lc (20)	St (5)	Significant (45)
Traffic congestion and public annoyance	Develop a traffic plan to minimize traffic flow interference from construction activities, advance local public notification of construction activities, schedule, routing, and affected areas, including road closures, arrange for night time construction for activities in congested/ heavy daytime traffic areas, provide traffic	Direct	M (20)	Lc (20)	St (05)	Significant (45)

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
	diversion/alternative routes if road closure is unavoidable, and inform the public through mass media and hoarding boards.					
Operation and Maintenance Stage						
Embankment erosion due to outlet of storm water drainage	Stepping retaining/ protection wall will be constructed at Danda nala, Ghanghara Nala, Rohini River. Maintenance of the slope protection measures and drainage works will be done. Adaptation of bio-engineering techniques at the downstream. Selecting cut and fill slope at the correct angle, depending upon the soil type. Re-vegetation of cut & fill slope or exposed areas as soon as possible by use of local plant species will be done. Maintenance of the slope protection measures and drainage works, adaptation of bio-engineering techniques, re-vegetation of cut and fill slope or exposed areas as soon as possible, by using native plant species.	direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Pollution of ground and river water due to seepage of waste water	Awareness programme will be applied to the local public and strict rules and regulation will be made for not to mix the waste water to the drainage, Regular cleaning and de-silting of drainage will be done, Adequate human resources and maintenance equipment and tools will be provided as part of the project, periodic clearing of side drains (especially before the start of the monsoons) and cross-drainages to allow for the passage of the rainwater, Implementation of a maintenance program will be done.	direct	H (60)	Lc (20)	Lt (20)	Very Significant (100)
Removal and disposal of sludge	Personal protection equipment (PPE) will be provided, Manual handling of waste will be avoided and use mechanical diggers and tools wil be made, Training to the maintenance workers on safe handling of waste will be provided, Regular cleaning and de-silting of the drainage will be done, Adequate human resources and maintenance equipment and tools will be provided, Maintenance workers will be provided oils for skin protection, soap to clean up later, and PPE (gloves, gum boots, face masks), Onsite training to workers on the safe handling of contaminated	direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
	water and sludge, The de-silted materials will be land filled safely in designated sites in consultation with the locals, preferably in the sanitary landfill site.					
Nuisance to neighbouring areas due to odour, insects and rodent	Ensure regular cleaning and de-silting; provide adequate human resources and maintenance equipment and tools as part of the project, periodic clearing of side drains (especially before the start of the monsoons) and cross-drainages to allow for the passage of the rainwater, waste disposal into water bodies will be avoided, implementation of a maintenance program.	direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Biological Impacts						
Construction Phase						
Operation and Maintenance Phase						
Aquatic life hazard due to mixing of drain at the water sources	Monitoring and prevent entry of wastewater directly into drains and rivers by enforcing strict regulations, prohibit washing of vehicles next to rivers and streams, awareness programmes will be organized to educate local people in water conservation.	Indirect	L (10)	Lc (20)	Lt (20)	Significant (50)
Chemical Impacts						
Construction Phase						
Use of Bitumen and their storage, heating, spreading	Proper handling and care will be taken while storing, heating, and spreading bitumen. Care will be taken so that no bleeding will occur. Similarly, sealing and securing the storage yard with berms all around will be done for avoiding/ controlling soil/ groundwater contamination due to spillage of bitumen, lubricants, fuels and other chemicals.	Indirect	H (60)	Lc (20)	St (5)	Very Significant (85)
Use of fuel, lubricants, oil, acids and other chemicals for construction (vehicles, plant and equipment) and their storage	Proper handling, monitoring and use of chemicals and petroleum products will be done, storage of chemicals will be done in closed container in such a way that no spill of such chemicals will occur.	Indirect	H (60)	Lc (20)	St (50)	Very Significant (85)
Operation and Maintenance Phase						

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
Formation of different toxic gases due to blockage of the drain	Periodic clearing of side drains (especially before the start of the monsoons) and cross-drainages to allow for the passage of the rainwater, implementation of a maintenance program, ensure regular cleaning and de-silting.	direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Socio-Economic and Cultural Impacts						
Pre-Construction Phase						
Land acquisition and compensation (land Loss)	Land acquisition and Compensation will be done as per *Land acquisition act 2034 BS*	direct	H (60)	Ss (10)	St (5)	Significant (75)
Construction Phase						
Impact on public / private utilities	Reinstatement of damaged community services and infrastructure will be done. People will be notified for the restoring of utilities as soon as possible to overcome public inconvenience. Reinstate/ relocation of community assets that are disturbed, such as households, properties, electricity poles, telephone lines, drinking water pipes, etc. to the satisfaction of the people will be done.	direct	H (60)	Ss (10)	St (5)	Significant (75)
Possible impacts on public important, religious and cultural sites	Being cultural, religious and archaeological sites like Durga Mandir and other temples located at indirect impact zone of the proposed work, they will be less impacted and protection will be done. Working at sensitive times (during religious festivals in the area) will be avoided. Work force in sensitive areas will be increased so as to finish the work quickly.	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Nuisance from Construction Camps	Establish workforce camps with sanitary amenities at designated sites only, monitoring of noise and vibration levels regularly at site to meet the standards, fit mufflers on vehicles to control noise, prohibit the operation of crushing plants and construction vehicles during the night so as to cause the least disturbance, dust suppression in surroundings by sprinkling water as required at regular intervals.	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Pressure on Social service facilities and Traffic Congestion	Facilities regarding water supply, sanitation, food etc. will be provided for labours during construction phase. Construction schedule and working time will be developed in such a way that there will be less impact on the existing traffic.	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
Public Health hazards	Launching awareness programs concerning human health with the help of meetings, trainings, brochures, posters, and signboards. Proper sanitation system will be developed to reduce the air and water pollution. Drinking water facility and temporary pit latrine will be established at construction site to control open defecation and pollution of water bodies by the workers.	direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Occupational health and safety	Provide regular health check-ups, sanitation and hygiene, health care, and control of epidemic diseases to the workforce, make available protection gear (PPE) to all construction workers and compensate for the loss of life or any type of injuries, provide insurance to the workers and training in OHS and community health and safety, rigorous training of workers on community health and safety and potential occupational health, safety measures.	direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Nuisance to pedestrian	Speed of vehicles at construction site will be limited; Ban of the use of power horns in vehicles will be done in coordination with traffic police. Stockpiling of construction materials will be done in proper areas. Dust suppression in surroundings by sprinkling water as required at regular intervals. Prohibiting entry at construction sites to the public, barricading the area and provide warning signs.	direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Operation and Maintenance Phase						
Risk of health and safety hazards to workers from hazardous materials which will be contained in waste water	Awareness programmes, meetings, regular consultation to the public will be done for not to mix the waste water to the drain, Proper monitoring and preventing entry of waste water containing hazardous material into drains by enforcing strict regulations, Regular cleaning and de-silting of drains will be done; Adequate human resources and maintenance equipment and tools will be provided as part of the project; PPE will be provided; Manual handling of waste will be avoided, Trainings to the workers on safe handling	direct	M (20)	Lc (20)	Lt (20)	Significant (60)

Impacts	Adverse Impacts Mitigation measures	Nature	Magnitude	Extent	Duration	Significance (Total Score)
Blockage of drainage and nuisance to neighbouring areas due to overflow and flooding	Periodic clearing of side drains (especially before the start of the monsoons) and cross-drainages to allow for the passage of the rainwater; Implementation of a maintenance program will be strictly followed; Regular cleaning and de-silting will be done Adequate human resources and maintenance equipment and tools will be provided	direct	L (10)	Ss (10)	Lt (20)	Insignificant (40)
Nuisance to neighbouring areas due to odour, insects and rodent	Awareness will be provided to the people not to throw unnecessary things to the drainage; Enforcement of laws and orders for the people for throwing the waste to drain and Regular maintenance of drainage will be done	direct	M (20)	Lc (20)	Lt (20)	Significant (60)

NOTE:

Magnitude: This can be low-L (Minor), medium-M (moderate) and high-H (major) depending upon the severity of change.

Geographical Extent: If the action is confined to the sub-project area, it is referred as site specific (Ss), if it occurs outside but close to the sub-project area, the extent of impact is local (Lc), if it occurs far away from the sub-project, it is referred as regional (R)

Duration: It can be short term (St- i.e. less than 3 years), medium term (Mt- i.e. 3-20 years) and long term (Lt- i.e. more than 20 years).

For the impact evaluation the matrix method with numerical ranking is used for the quantitative ranking of the predicted impacts. The numerical scale mentioned in the National EIA Guidelines 1993 AD has been adopted for this subproject. The combined score up to 44 is termed as insignificant impact; 45-74 is termed as Significant and beyond 75 is termed as very significant impact.

Magnitude		Extent		Duration	
High	60	Regional	60	Long Term	20
Moderate	20	Local	20	Medium Term	10
Minor	10	Site specific	10	Short Term	05

VII. ENVIRONMENTAL MANAGEMENT PLAN

137. The EMP is to ensure that the activities are undertaken in a responsible, non-detrimental manner by providing proactive, feasible, and practical working tools and specific actions necessary to mitigate environmental impacts of the subproject. The EMP also assigns responsibilities, timescales, and performance indicators/standards for each mitigation measure to make sure that they are implemented and not ignored. An environmental monitoring plan is also included in the EMP which recommends protocols and responsibilities for monitoring the subproject.

138. For this roads and drainage improvement subproject, 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. The contractor will also be required to post relevant EMP information on the work sites at all times.

A. Institutional Arrangement

139. **Executing and implementing agencies.** The Ministry of Urban Development (MOUD) having prior experience in managing urban and water supply projects financed by ADB, will be the executing agency of the overall project. The participating municipalities will be the implementing agencies.

B. Safeguard Implementation Arrangement

140. **Project coordination office.** A PCO has been established for the overall management of the ongoing IUDP project and the same will function for the proposed RUDP financing. The PCO is headed by project director supported by officials including two deputy project director's and other project managers. The PCO receives support from the PMSC and DSC established under the IUDP. PMSC and DSC will be providing support to the PCO for the RUDP in the same fashion. While there is no designated environmental safeguards officer in the PCO, The Deputy Project Director's and the Project Director are regularly apprised of the safeguards management by the PMSC and DSC. Key tasks and responsibilities of the PCO relating to safeguard (environment) 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.

141. **Project implementation unit.** The participating municipalities will establish a PIU within the municipal structure. The PIUs will (i) be responsible for land acquisition if any; (ii) take necessary action for obtaining rights of way if required; (iii) plan, implement and monitor public relations activities, gender mainstreaming initiatives and community participation activities at municipal 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 focal person[4] and will receive assistance from the assigned DSC 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 F, Appendix 6 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 PCO;
(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.

142. **Design and Supervision Consultants (DSC).** DSC will be engaged to work closely with and advise the PCO, to be involved in project supervision including monitoring during construction phase. The DSC will have environmental specialist(s), but not limited to:

(i) Work under the general supervision of the team leader and deputy team leader;
(ii) Review the environmental guidelines and requirement of the government of Nepal and ADB's SPS, 2009, environmental subproject selection guidelines and EARF and guide the implementation of future subprojects;
(iii) Provide technical support to the PCO 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;

[4] It is recommended that existing municipality senior officer (executive engineer) will also work as responsible safeguard officer in addition to his/her regular responsibilities within the municipality.

(iv) Assist and guide the PIU's and contractor's environmental officers to provide support to environmental management functions including updating subproject IEEs in respect to EMP;
(v) Assist in preparing IEEs and assist in monitoring impact and mitigation measures associated with subprojects;
(vi) Assist PIUs working in the steps for preparing the IEE and EIA, capacity building and training, preparation of guidelines and procedure and subproject specific guidance;
(vii) Provide support and guidance in undertaking environmental monitoring by PIUs;
(viii) Support PCO in submitting semi-annual environmental monitoring reports to ADB;
(ix) Facilitate in grievance redress and corrective actions;
(x) Train PIU officials regarding environmental requirement and issues; and
(xi) Perform any other task assigned by the team leader, deputy team leader and the project director.

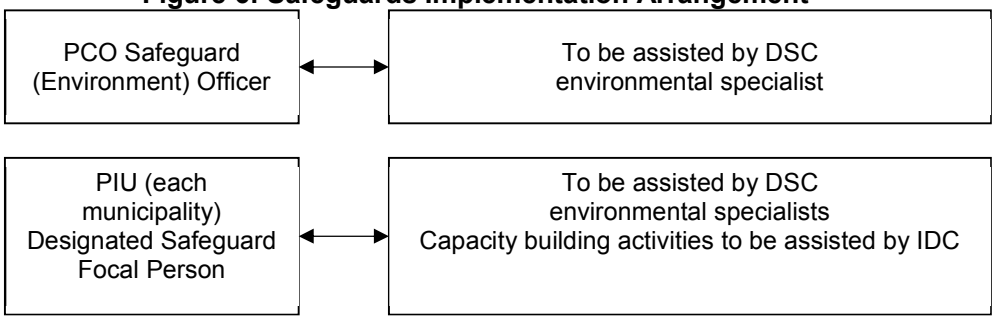
143. Civil works contracts and contractors. EMPs are to be included in bidding and contract documents and verified by the PIUs and PCO. The contractor will be required to designate an environmental supervisor to (i) coordinate with DSC on updating the IEE/EMP based on detailed designs, and (ii) ensure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

(i) **Bidding stage:**
  (a) Understand the EMP requirements and allocate necessary resources (budget, staff, etc.,)
  (b) Understand the regulatory compliance requirements related to labour welfare, safety, environment etc.
  (c) Make available a budget for environmental measures in the EMP

(ii) **Construction stage:**
  (a) Ensure that all regulatory clearances (both project related and contractor related) are in place before start of the construction work.
  (b) Mobilize EHS supervisor prior to start of work
  (c) Confirm with PIU availability of rights of way at all project sites prior to start of work.
  (d) Prepare Method Statement and get it approved prior to start of work
  (e) Prepare SEP and submit to PCO/PIU for approval
  (f) Prepare the following duly incorporating EMP measures, and submit to the PIU: (i) construction waste management (CWM) plan; (ii) traffic management plan; (iii) occupational health & safety (OHS) plan
  (g) Implement the mitigation measures as per the EMP including CWM & traffic management plans
  (h) Follow the EMP/ SEP measures/ guidelines for establishment of temporary construction camps, construction waste disposal sites, and material borrow areas, etc.
  (i) Implement EMP and ensure compliance with all the mitigation and enhancement measures
  (j) Conduct environmental monitoring (air, noise, water etc.,) as per the EMP
  (k) Undertake immediate action as suggested by PIU/ PMU/ PMC to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation
  (l) Submit monthly compliance reports on EMP implementation

(m) Act promptly on public complaints and grievances related to construction work and redress in a timely manner in coordination with PIU
(n) Comply with applicable government rules and regulations
(o) Site clean-up and restoration

Figure 6: Safeguards Implementation Arrangement



C. Institutional Capacity Development Program for EMP Implementation

144. The DSC environmental specialists will be 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 city roads and drainage, solid waste management and water supply 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.

D. EMP Tables

145. **Table 24** provides the specific mitigation measures, responsibilities of PIU, DSC and contractors. The contractor will be required to submit to PIU, for review and approval, a site environmental plan (SEP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEP; and (iv) budget for SEP implementation. No works are allowed to commence prior to approval of SEP.

E. Environmental Monitoring Program

146. **Tables 25** and **26** provide the indicative monitoring program based on the EMP tables. The detailed and final environmental monitoring program has to be provided by the contractor as part of the SEP. During the construction period, it is the contractor's responsibility to ensure mitigation measures are implemented and to conduct environmental sampling and analysis. PCP and PIU will verify and conduct site inspections from time to time. The contractor is required to submit results of environmental monitoring which PIU will include in the environmental monitoring reports.

147. PIU and DSC will work closely with the contractor in developing site-specific monitoring checklists.

Table 24: Environmental 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 coordination office (PCO), project implementing unit (PIU), Design Supervision Consultants (DSC)	• 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 PCO and PIU. • Mitigation measures are included as part of TOR of PCO, PIU, DSC
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	PCO	• 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	PCO, PIU, DSC	• List of affected utilities and operators; • Bid document to include requirement for a contingency plan for service interruptions	• 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 PCO, PIU, DSC.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		include actions to be done in case of unintentional interruption of services. • Require contractors to prepare spoils management plan (see **Appendix 3** for outline) and traffic management plan (see **Appendix 4** for sample)		(example provision of water if disruption is more than 24 hours), spoil management plan (**Appendix 3**), and traffic management plan (**Appendix 4**)	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.	PCO, PIU, and DSC	• 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 PCO, PIU, and DSC.
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in	• Prepare list of approved quarry sites and sources of materials	PCO, PIU, and DSC	• List of approved quarry sites	• During detailed design	• No cost required. • Mitigation measures are

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.			and sources of materials; • Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	phase, as necessary with discussion with detailed design engineers and PIUs	included as part of TOR of PCO, PIU, and DSC.
EMP Implementation Training	Irreversible impact to the environment, workers, and community	• Project manager and all key workers will be required to undergo EMP implementation including spoils management, Standard operating procedures (SOP) for construction works; health and safety (H&S), core labor laws, applicable environmental laws, etc	Construction Contractor	• Proof of completion (Safeguards Compliance Orientation) • Posting of proof of completion at worksites • Posting of EMP at worksites	• During detailed design phase prior to mobilization of workers to site	• Cost of EMP Implementation Orientation Training to contractor is responsibility of PCO 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	• 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	Construction Contractor	• Records of sources of materials	• Monthly by PIU	• 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
	a relatively small area and reversible by mitigation measures.	(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.				
Water quality	Trenching and excavation, run-off from 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 local authority on designated disposal areas. • All earthworks must to be conducted during dry season to 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	Construction Contractor	• Areas for stockpiles, storage of fuels and 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 or	• 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
		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.		water bodies due to construction activities		
Air quality	Conducting works at dry season and moving large	• Damp down exposed soil and any sand stockpiled	Construction Contractor	• Location of stockpiles;	• Visual inspection by	• Cost for implementation of

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.	on site by spraying with water when necessary during dry weather; • 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.		• Number of complaints from sensitive receptors; • Heavy equipment and machinery with air pollution control devices; • Certification that vehicles are compliant with air quality standards.	PIU and supervision consultants on monthly basis • Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	mitigation 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 vibrations may be caused by excavation equipment, and the transportation of equipment, materials, and people. However, the proposed subproject will follow existing	• 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 Cox's Bazaar local authority so that activities with the greatest potential to generate noise are	Construction Contractor	• Number of complaints from sensitive receptors; • Use of silencers in noise-producing equipment and sound barriers; • Equivalent	• 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
	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.	conducted during periods of the day which will result in least disturbance. • 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 80 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		day and night time noise levels	detailed design stage and final location of subproject components	

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		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.				
Aesthetics	The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess 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.	• Prepare the Debris Disposal Plan • Remove all construction and demolition wastes on a daily basis. • Coordinate with 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 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	Construction Contractor	• Number of complaints from sensitive receptors; • Worksite clear of hazardous wastes such as oil/fuel • Worksite clear of any wastes, collected materials from drainages, unutilized materials and debris • Transport route and worksite cleared of any dust/mud	• 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
		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;				

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
B. Biological Characteristics						
Biodiversity	Activities being located in the built-up area of Siddharthnagar. There are no protected areas in or around subproject sites, and no known areas of ecological interest. There are no trees at the site that need to be removed.	• 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 tress will be required, compensatory plantation for trees lost as per the ministry of forests requirements 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	Construction Contractor	• PCO 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) • Number of complaints from sensitive receptors on disturbance of vegetation, poaching, fishing, etc.	• 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
		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.				
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-specific within a relatively small area and reversible by mitigation measures.	• Prepare and implement a Traffic Management Plan (see **Appendix 4** 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.	Construction Contractor	• Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite as per Traffic Management Plan (see **Appendix 4** for sample); • Number of complaints from sensitive receptors; • Number of signages placed at project	• 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
		• Notify affected sensitive receptors by 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		location • Number of walkways, signages, and metal sheets placed at project location		

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		compensated to pre-work conditions.				
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 XXX-months construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term.	• 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 Nepal Labor Regulations 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 components	• Cost for implementation of mitigation measures responsibility of contractor.
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 Siddharthnagar, 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.	• 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 on nature and location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible; • Consult with local community to inform them	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	• 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
	Excavation may also damage existing 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.	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 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. •			and final location of) subproject components	
Community	Construction works will	• Provide safety signage at	Construction	• Number of	• Visual	• Cost for

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
health and safety	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 and children.	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. • If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment 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	Contractor	permanent signage, barricades and flagmen on worksite as per Traffic Management Plan (see **Appendix 4** 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 case of using private lands as work camps, storage areas, etc.	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	implementation of mitigation measures responsibility of contractor.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		chemicals.[5] • 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				

[5] These products come in powder forms, and once mixed with water (being the catalyst) simply expand, and crack the rock from hole to hole. This product is environmentally friendly and can be washed away after it has been used.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		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 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				

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		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 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 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	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 • Use of personal protective	• 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
		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[6] 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		equipment • % of moving equipment outfitted with audible back-up alarms • Permanent sign boards for hazardous areas • Signage for storage and disposal areas • Condition of sanitation facilities for workers		

[6] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		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 • Mark and provide sign boards for hazardous				

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		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 • Disallow worker exposure to noise level greater than 85 dBA for a 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 Cox's Bazaar 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,	Construction Contractor	• Records of chance finds	• 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
		structures and other remains of archaeological interest. • Stop work immediately to allow further investigation if any finds are suspected.			detailed design stage and final location of) subproject components	
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 • PMO to submit semi-annual monitoring report to ADB	• Cost for implementation of mitigation measures responsibility of 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	Construction Contractor	• PCO 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	• Prior to turn-over of completed works to municipality	• 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
		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 topsoiled and regrassed 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.		O&M are removed; and (iv) worksite clean-up is satisfactory.		

Table 25: 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
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 • 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 regrassed 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	• PCO/ DSC 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 municipality	• Cost for implementation of mitigation measures responsibility of contractor.

Table 26: 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 stockpiled debris/sediments from drainages 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 entering of run-off into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies. • Remove all debris/ sediments immediately. • Dispose debris/ sediments at a designated site such as landfill. It is important that the designated disposal site's base is of a non-permeable membrane in order to prevent leachate that can contaminate the soil and groundwater.	• Siddharthnagar municipality	• No visible degradation to nearby drainages or water bodies due to construction activities	• Duration of repair works	• Included in O&M cost
Air quality	Moving debris/ sediments from drainages may create dusts during dry season. The impacts are negative but short-term, site-specific within a relatively small area	• Use tarpaulins to cover soils, sand and other loose material.	• Siddharthnagar municipality	• No 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
	and reversible by mitigation measures.					
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 Cox's Bazaar 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.	• Siddharthnagar municipality	• No complaints from sensitive receptors	• Duration of repair works	• Included in O&M cost
B. Biological Characteristics						
Biodiversity	Activities in the built-up area of Siddharthnagar. 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).	• Siddharthnagar municipality	• No complaints from sensitive receptors	• Duration of repair works	• Included in O&M cost
C. Socioeconomic Characteristics						

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
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. • Consult businesses and institutions regarding	• Siddharthnagar municipality	• No 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
		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 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 and masks) at all times; (iii) providing (H&S) training for all site personnel; (iv)	• Siddharthnagar municipality	• No complaints from sensitive receptors • No 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
		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 • 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				

Field	Impacts	Mitigation Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		general public as appropriate. • Disallow worker exposure to noise level greater than 85 dBA for a 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 drainages and built-up areas of municipality 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.	• Siddharthnagar municipality	• Records of chance finds	• Duration of repair works	• Included in O&M cost

VIII. IMPLEMENTATION OF MITIGATION MEASURES

148. The mitigation measures will be integrated into project design and tender documents. Using this approach, the mitigation measures will automatically become part of the project construction and operation phase. By including mitigation measures in the contract or in specific items in the bill of quantities, monitoring and supervision of mitigation implementation will be covered under the normal engineering supervision provisions of the contract.

A. Project Design

149. The mitigation measures will be integrated in the design of the project itself. Such a step will enhance the mitigation measures in terms of specific mitigation design, cost estimation of the mitigation measures, and specific implementation criteria. The mitigation measures integration in the design phase will also help in strengthening the benefits and sustainability of the project.

B. Project Contract

150. The project contractor will be bound by the parameters identified in the environmental assessment pertaining to specific mitigation measures in the contract. The final acceptance of the completed works will not occur until the environmental clauses have been satisfactorily implemented.

C. Bill of Quantities

151. The tender instruction to bidders will explicitly mention the site-specific mitigation measures to be performed, the materials to be used, labour camp arrangements and waste disposal areas, as well other site specific environmental requirements.

D. Supervision and Monitoring

152. The purpose of supervision is to make sure that specific mitigation parameters identified in the environmental assessment and as bound by the contract is satisfactorily implemented. Likewise, monitoring is necessary such that the mitigation measures are actually put into practice.

153. Prior to commencement of the works, the contractor will submit a compliance report to PIU that all identified pre-construction mitigation measures as detailed in the EMP are undertaken. Contractor should confirm that the environmental health and safety supervisor is mobilized. PIU with the assistance of the DSC will review the report and permit commencement of works.

154. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PIU. PIU will review and advise contractors for corrective actions if necessary. A semi-annual environmental monitoring report (EMR) summarizing compliance and corrective measures taken will be prepared by PMC and submitted to PIU. PMU will submit to ADB the semi-annual (6-monthly) EMR. Once concurrence from the ADB is received the report will be disclosed on the PCO and PIU websites.

155. DSC will be responsible for checking the monthly progress reports submitted by the contractor/s and field verified whether or not the contractor has complied with the approved conditions as stated in the EMEP. The contractor's monthly progress report should contain information on the works carried out and the results of all monitoring and investigation works

performed during that particular month. The report should also include cases of compliance and non-compliance and the corresponding further mitigation measures to be adopted to correct the non-compliances and also include the outcome of the monitoring, important issues identified and the measures to be undertaken to ameliorate them. The reports will suggest corrective actions where necessary.

156. ADB will review project performance against the MOUD 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.

E. Environmental Monitoring

157. The IEE prescribes the mitigation measures in order to minimize adverse impacts and to enhance beneficial impacts. Environmental monitoring plan is an important tool to ensure the implementation of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. Environmental monitoring generates useful information and improves the quality of implementation if mitigation measures.

F. Monitoring Responsibility

158. Monitoring is an integral part of the project proponent so as to know the unlikely impacts and implement corrective measures. The proponent, Siddharthanagar municipality/ project implementation unit (PIU) will develop in-built monitoring mechanism to show its additional commitment for environmental improvement and mitigate undesirable environmental changes, if any during construction and operational phase. Siddharthanagar municipality/ project implementation unit (PIU) will be supported by team of PMSC, DUDBC/ PCO and Project team for environmental monitoring effectively.

159. According to EPR, 1997, the MOUD is responsible for monitoring and evaluation of the impact of the implementation of the project. The MOUD checks whether the Siddharthanagar municipality/ project implementation unit (PIU) is carrying out monitoring activities as per the IEE, and if the prescribed mitigation measures are being implemented.

160. Siddharthanagar municipality/ PIU with PMSC, DUDBC/ PCO support will make arrangement for sub-project level monitoring. It will constitute a monitoring team, which will be independent from the implementation team and will consist of relevant persons in the context of a sub-project being monitored, for example persons from the forest, agriculture, social and NGO sectors. The monitoring team will be constituted separately for each monitoring event. Project's district management team will be responsible for forming the monitoring team, financing the monitoring works, providing logistic and other necessary support. The subproject specific monitoring plan as given in Table above will be followed. At least one monitoring in each construction seasons is necessary.

161. The sub-project level monitoring team will submit its report to Siddharthanagar municipality/ PIU, which will forward a copy to the MOUD. Total cost of environmental monitoring (field visits, observation, review or reports and report preparation) is estimated NRs. 930000.00 for IUDP and RUDP as given in Table below.

Table 27: Environmental Monitoring Cost

Manpower Requirement	Duration (month)	Rate (NRs.)	Amount (NRs.)
Team Leader/ Environmental Specialist	2	75000	150000
Engineer	1	60000	60000
Forester	1	60000	60000
Socio-economist	1	60000	60000
Cost of Monitoring by Siddharthanagar municipality/ PIU and MOUD	2	100000	200000
Supporting Staff	2	25000	50000
Transportation Cost		LS	150000
Report Preparationand Sampling/ lab test		LS	200000
Total			**930000**

G. Types of Monitoring and Monitoring Parameters

162. Monitoring is an ongoing component of the environmental assessment process and subsequent environmental management and mitigation activities. There are basically three types of environmental monitoring:

163. **Baseline Monitoring.** This is done if the project is not going to be implemented recently (in this project not required).

164. **Compliance monitoring.** It verifies whether contract environmental clauses and the mitigation measures are properly implemented in the field.

165. **Impact monitoring.** It confirms whether the environmental mitigation measures specified in the project design and contract are correctly formulated. The nature and purpose of environmental monitoring will be different in the pre-construction phase, construction phase and operation phases of the project.

Summary of the mitigation measures and mitigation cost including roadside plantation and bio-engineering

Table 28: Cost for Environmental Management Plan and Bio-engineering as per BoQ

S.N	Item	Unit	Quantity	Rate	Amount
1	**Planting shrub and tree seedling 'and cutting on site**: Supplying, Providing, Planting containerised tree and shrub seedlings, including pitting, transplanting, composting and placing tree guards, on toe of embankment slopes in plain areas, pit size '30 cm diameter x 30cm depth.Compost volume 1/4 of the volume of the pit, mixed with original soil. Also, protection works from chicken net including all complete set up to 3months minimum for curing and maintenance (regulary).	Nos.	2000	3403.12	6,806,240.00
2	Supplying a 1.5m long stand (clear from ground) in 2mm thick steel plate (Size=0.9mx0.4m) traffic sign board including painting, writing, transporting with traffic management words etc. complete for the construction site not less than 5Nos. in per Km and handover in good condition to the Municipality after the	Nos.	180	6000.00	1,080,000.00

S.N	Item	Unit	Quantity	Rate	Amount
	completion of work and as per instruction of Engineer				
3	Gabion works for River Protection Work: Supply, fabrication and assembling of different size of gabion boxes(weaved with heavily Zinc coated wires) of hexagonal mesh type 110 mm x 120 mm, with mesh wire 10 swg, selvedge wire 8 swg, binding wire 12 swg and stone filling in gabions including transport and fixing of gabions in position and as per Drawing, specification and directed by engineer.	m3	1230	3303.57	4,063,395.20
4					
4.1	Health and Safety Training	Nos.	500	3000.00	1,500,000.00
4.2	Boot set	Nos.	2500	250.00	625,000.00
4.3	Army cloth Shoes type (for Female Labor)	Nos.	825	210.00	173,250.00
4.4	Globe set	Nos.	3325	175.00	581,875.00
4.5	Helmets	Nos.	3325	195.00	648,375.00
5	Providing and spraying of water from water tank on the under construction road pavement layer in full width from the dust pollution as per EMP, as per instruction of Engineer.	Hr.	2500	550.00	1,375,000.00
	Environment Management Plan and Plantation				**16,853,135.20**

Note: Provisional sum for the project execution.

Table 29: Framework for Monitoring Environmental Issues

S.N	Monitoring Parameters	Monitoring Indicators	Monitoring Mechanism	Schedule	Responsible Agency
A.	**Pre-Construction Phase**				
1	Public Consultations	Integration of local people's environmental concerns	Discussion with local residents, representatives and stakeholders	During the study and design process and prior to approval	Municipality/ CSC/ expert as required
2	Incorporation of Mitigation Measures	Incorporation of Mitigation Measures and Environmental codes of conduct into design and construction works	Review detail design and drawings to ensure environmental monitoring provisions are included, BOQ documents	During project approval	Municipality/ Project/ DUDBC,PCO
B.	**During Construction Phase**				
3	Drainage Condition	Construction and location of drainage facilities	Site inspections at places where such drains are required, observation on water logging problem	During construction and operation	Municipality/ CSC
4	Protection of Top Soil	Storage and reinstatement of top soil for later use	Inspection of site clearance activities, process of storage and reinstatement of top soil	During construction	CSC
5	Disruption to public utilities	Compensate or reinstate/ relocate community assets that are disturbed, such as irrigation canals, electricity poles, telephone lines, drinking water pipes, sewerage lines, roads, etc. to the satisfaction of the people	Site observation, discussion and seeking of feasible solutions and field observation to visually assess if disturbed community assets have been reinstated.	During and immediately after construction	Project/ Municipality/ CSC
6	Spoil Disposal	Affected aesthetic value, affected agriculture, initiated land erosion by local blocked drainage, hazard to downhill slope residents and agricultural lands.	Site observation and interviews, photos, geo-referencing sites	During construction	Municipality/ CSC
		Safe disposal of excavated materials and other construction wastes generated by construction workers	Disposal site observation and disposal practice	During construction	Municipality/ CSC
		Impacts on agricultural land due to spoil, soil erosion, water logging etc.	Site Observation and discussion with local residents	During construction	Municipality/ CSC
		Proper reclamation of disposal sites	Observation of finished disposal sites	Before starting, in between and after completion	Municipality
7	Traffic Congestion and Public annoyance	Develop a traffic plan to minimize traffic flow interference from construction activities. Provide traffic diversion/alternative routes if road closure is unavoidable, and inform the public through mass media and hoarding boards.	Visual observation of traffic; complaints from travellers and the public; existence of signage and effectiveness of speed control and diversion measures	Weekly during construction	Project/ CSC/ Municipality
		Impact to terrestrial fauna	Visual inspection and discussion with locals	Continuously during construction/ operation	Municipality

S.N	Monitoring Parameters	Monitoring Indicators	Monitoring Mechanism	Schedule	Responsible Agency
		Nuisance to pedestrian	Visual observations; feedback from nearby residents and pedestrian	Every week	Municipality
8	Water Pollution	Quality of surface water, observation of open defecation and waste disposal around water sources near construction sites and direct discharge of industrial waste to drain	Use field kit / visual observation	Once a month	Project/ CSC
		Impact on fish and other aquatic life due to water pollution	Visual observations; water quality of receiving waters, including groundwater	Once a month	CSC
		Quality of surface water and river due to use of fuel, lubricants, oil, acids and other chemicals for construction and leakage of oil, grease and other materials	Visual observations; water quality of surface water and river, including groundwater	Once a month	CSC
9	Air Pollution	Quality of Air pollution near settlements due to increase in dust/suspended particulate matter and rise in noise level and vibration due to construction works	Observation of good construction practices and discussion with residents and workers and sound level monitoring	Monthly	CSC
10	Cultural sensitive spots	Protection of culturally sensitive spots	Site observation, discussion with local residents	Upon demand	Municipality
		Inflow of labour and cash will disrupt social setting and affect law and order situation and disputes between local labour and the outside work force	Site observation, discussion with local residents, Crime records and causes; camp issues; enforcement of remedies; security situation in camps	Once a month or as required	Municipality
11	Quarry sites and Burrow Pits and landscape disturbance	Initiated erosion, changes in river regime, erosion by river systems, landslide due to quarrying, degradation of vegetation, water logging, waterborne diseases	Site inspection, discussion with local residents	Weekly during quarry operation	Project/ CSC
12	Health Hazard	Occupational Health Safety	Check health records; clinic and first aid facilities; health complaints; number of trainings provided; check list of workers and whether insurance has been provided	Every week	CSC
13	Change in economy	Operation and closure of quarries and burrow pits	Site inspection, discussion with local residents	Weekly during quarry operation and closure	Project /CSC
		Numbers of people employed by the project during construction, numbers of women in work forces	Record kept by the project management, discussion with stakeholders	Start of construction then once every month	CSC/ Municipality
C. Operation Phase					

S.N	Monitoring Parameters	Monitoring Indicators	Monitoring Mechanism	Schedule	Responsible Agency
14	Drainage Pattern	Surface flow interruption and its consequences, status of rehabilitation, service	Visit the area, mapping, discussion with local people, water logging problem,	Upon demand, Half yearly	Municipality
		Blockage of drainage and nuisance to neighbouring areas due to formation of different toxic gases	Visual Observation	Weekly	Municipality
15	Air pollution, Vehicular emission, noise	Air quality, increase in noise pollution, dust emission, traffic load, quality of vehicle	Travel along the road, discussion with local people, pedestrians, passengers, transport operators, visual operation, air quality measurement (NOx, PM10, SO2, SPM)	Upon demand, half yearly	Municipality
16	Water Quality	Observation of open defecation and waste disposal around water sources and Quality of ground and river water due to seepage of waste water	Visual observation, measurement of water sample using field kit	Annually	Municipality
17	Road Quality and Status	Observation of embankment erosion due to outlet of storm water drainage and Maintenance road check	Maintenance record, Visual inspection of road and road structures	Half yearly	Municipality
18	Change in Socioeconomic and culture	Observation of risk of health and safety hazards to workers from hazardous materials which will be contained in waste water	Observations, interview with local people, DDC, Police stations and VDC records.	During operation	Municipality

H. Training Activities on EMP Implementation

166. Table 30 presents the outline of capacity building program to ensure EMP implementation. The detailed cost and specific modules will be customized by DSC in consultation with PCO and PIU after assessing the capabilities of the target participants and the requirements of the project. The responsibility of organizing and conducting the training will be by the DSC Environmental Specialist.

Table 30: Outline Capacity Building Program on EMP Implementation

Description	Contents	Schedule	Participants
Pre-construction stage			
Orientation program	- RUDP Environmental safeguard requirements - Implementation arrangement - monitoring & reporting - Corrective actions	½ day orientation workshop-at the start of the program	PCO, PIUs–all senior and mid-level officials and engineers involved in DWSSIP
Training program on EMP implementation & monitoring	Module 1–Orientation - ADB SPS; - Government of Nepal Environmental Laws and Regulations. Module 2 – Environmental Assessment Process. - Environmental process, identification of impacts and mitigation measures, formulation of an EMP, implementation, and monitoring requirements; - Review and approval of environmental assessment reports Module 3: EMP Implementation, monitoring & reporting - Incorporation of safeguard clauses and EMP in bid and contract documents - Pollution prevention and abatement (IFC EHS Guidelines) -. Monitoring & evaluation - Formulation of corrective action plans (CAP) - Reporting Module 4: Consultation & disclosure - Grievance redress mechanism	2 day training program-prior to invitation of any bids for civil works under RUDP	PCO and PIU staff
Construction stage			
Orientation program	- Contractual requirements - Legal & regulatory requirements - EHS requirements - Site Environment Plan (SEP) preparation, EMP implementation and reporting - Roles and responsibilities	½ day orientation course to during mobilization	Contractors and PIUs, DSC supervising staff

Description	Contents	Schedule	Participants
Training program/ workshop for contractors and supervisory staff.	- Environmental issues during construction; - Site specific SEP - EMP Implementation - Day to day monitoring - Periodic ambient monitoring - Reporting - Consultation & grievance redress	1 day workshop immediately after mobilization	Contractors and PIUs, DSC supervising staff
Periodic refresher training workshop	Same as above	½ day workshop thrice a year	Contractors and PIU, DSC supervising staff
Stakeholder workshop Experience and best practices sharing.	- Experience of EMP implementation–issues and challenges; - Best practices followed.	½ day workshop Once in a year during implementation	PIU, and stakeholder agencies

I. Cost estimates

167. Costs of all mitigation measures during the construction phase will be included in the tender and contract documents and will be borne by the contractors. The contractors and engineers shall be made aware of the importance of meeting environmental safeguard standards in the contracts, and the importance of preparing, submitting and getting the SEP (to be prepared for each subproject, according to the EMP) approved before construction starts.

168. An NGO will be hired to facilitate community outreach and awareness programs. The cost for hiring the NGO is estimated to be US $ 10,000 per annum.

169. The annual and total environmental cost for 5 years is given in Table 31.

Table 31: Indicative Cost of EMP Implementation

S. N.	Description	Unit Cost (USD)	Total Cost (USD)	Source of Fund
1	Project Management Specialist (PMC) 24 months	3,000	72,000	PMC Package
	Environment Specialist DSC 6 months	2,500	15,000	DSC Package
2	Public awareness campaign + IEC (on an intermittent basis)	10,000 per year	30,000	Project cost
3	EMP awareness training to contractors and engineers (1 day training)	Lump sum	1,000	Project cost
4	Air, noise and water quality monitoring (specific sites will be provided to construction contractors after detailed design and awarding of the contract	Lump sum	2,000	Contractor cost
5	Cost of mitigation measures according to EMP by the contractor	-	-	Contractor cost

IX. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

170. Meaningful stakeholder consultation and participation is part of the project preparation and implementation strategy. A consultation and participation program has been prepared for the project, and will be implemented with the assistance of consultants. By addressing stakeholder needs, there is greater awareness of the benefits and "ownership" of the project among stakeholders, which in turn contribute to sustainability.

171. Consultation, participation, and disclosure will ensure that information is provided and feedback on proposed project design is sought early, right from the project preparation phase, so that the views/ preferences of stakeholders, including potential beneficiaries and affected people, can be adequately considered in project design, and continue at each stage of project preparation, processing, and implementation.

172. Project-affected persons (APs) will be consulted at various stages in the project cycle to ensure: (i) incorporation of views/ concerns of APs on compensation/ resettlement assistance and environmental impacts and mitigation measures; (ii) inclusion of vulnerable groups in project benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and project-affected persons in the project process. Relevant information about any major changes to project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

173. A variety of approaches will be adopted. At minimum, stakeholders will be consulted regarding the scope of the environmental and social impact study before work commences, and they will be informed of the likely impacts of the project and proposed mitigation once the draft EIA/ IEE and resettlement plan reports are prepared. The reports will record the views of stakeholders and indicate how these have been taken into account in project development. Consultations will be held with a special focus on vulnerable groups.

174. The key stakeholders to be consulted during project preparation, EMP implementation, and project implementation include:

(i) beneficiaries;
(ii) elected representatives, community leaders, religious leaders, and representatives of community-based organizations;
(iii) local NGOs;
(iv) local government and relevant government agency representatives, including local authorities responsible for land acquisition, protection, and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments;
(v) residents, shopkeepers, and business people who live and work alongside the roads where pipes will be laid, and near sites where facilities will be built; custodians and users of socially and culturally important buildings;
(vi) PCO staff and consultants; and
(vii) ADB and the Government of Nepal.

The stakeholder consultation summary details conducted during the preliminary stage are provided as below:

Summary of Stakeholder meeting and key issues identified during Consultations

Place, Date and Discussion on Subprojects	Participants	Key issues discussed
Ward 1 and Ward 3 of Siddharthnagar Municipality	Ward Secretary, Political party representatives	• All the proposed infrastructure implementation is needed for Siddharthnagar town, there will be no negative impacts and the project implementation will lead to environment improvements. • Requested project to plant greenery along the roads. • Monitoring committee with 5 members established for Ward 3 for project monitoring during construction.
Ward 5, Ward 6 and Ward 8 of Siddharthnagar Municipality	Local representatives, Ward secretary and political representatives	• During construction dust and air pollution should be controlled (sprinkling of water) • There should be a divider with greenery in main roads • Regular monitoring and maintenance should be ensured • Request permanent flowerpots for beautification, dustbins as required for waste collection • Bust stops must be provided as required along the length of the roads • Sixth letter - Ward No. 10 - want greenery; do not want the construction materials to be dumped on the roads; dust controlled; suitable greenery for the climate and conditions • Seventh letter - Ward No. 11 - want greenery on the roadsides and bus stops; asking for water facilities • Eighth letter - Ward No. 12 - control dust pollution and have greenery by roadsides • Ninth - Ward No. 13 - want greenery beautification; want solar lamps in the streets and covered drains; work should start after the election; while doing road construction, water pipes should not be disturbed
Ward 10, Ward 11, Ward 12 and Ward 13 of Siddharthnagar Municipality	Local representatives, Ward secretary and political representatives	• Provide and maintain greenery along roads, bus stops • Proper construction waste management and disposal (no construction materials to be dumped on the roads) • Dust control during construction • Provide water facilities • Provide beautification, solar lamps in the streets and covered drains • Work should start after the election; while doing road construction, water pipes should not be disturbed.

Stakeholder consultation photographs and attendance sheet are provided as an Annex 11

B. Information Disclosure

175. Information is disclosed through public consultation and making relevant documents available in public locations. The following documents will be submitted to ADB for disclosure on its website:

(i)

(ii) For category B projects:
  (a) final IEE;
  (b) a new or updated IEE and corrective action plan prepared during project implementation, if any; and
  (c) environmental monitoring reports.

176. MOUD will send written endorsement to ADB for disclosing these documents on ADB's website. MOUD will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

C. Grievance Redress Mechanism

177. 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.

178. **Common GRM.** A common GRM will be in place for social, environmental, or any other grievances related to the project; the resettlement plans 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.

179. Affected persons will have the flexibility of conveying grievances/ suggestions by dropping grievance redress/ suggestion forms in complaints/suggestion boxes Installed by project municipalities, or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaint's register in municipal offices. **Appendix 9** has the sample grievance registration form. 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 coordination office (PCO) safeguard officer will have the overall responsibility for timely grievance redressal 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.

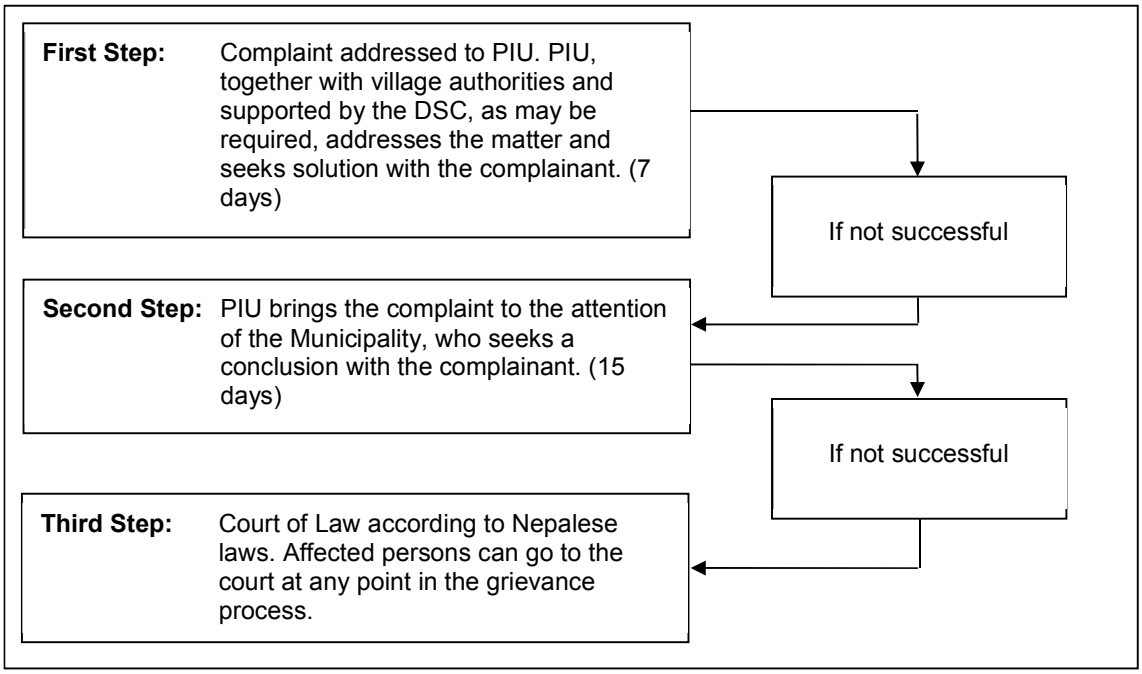
180. PIU will be the main responsible body for handling grievances. For this reason, PIU will appoint one grievance officer in charge of receiving, handling, and documenting all cases. PIU, supported by the DSC as may be required, will also be responsible for informing the affected population on their rights to grievance and the mechanisms to be followed.

181. Once an affected person submits a grievance, PIU, after registering the complaint, will seek in a first step to find a solution and come to an agreement with the complainant. Depending on the nature of the complaint, this may also involve the contractor, DSC or other involved parties. The contractors and PIU grievance officer 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.
182.

183. If a solution cannot be found, PIU will report the case to the municipality. Municipality will appoint an arbitration board to hear and settle the case. The arbitration board will attempt to resolve the complaint/grievance within 15 days. The PIU grievance officer will be responsible to see through the process of redressal of each grievance.
184.

185. If again a solution cannot be reached, or if the parties do not agree with the decision of the arbitration board, each party can take the case to court according to applicable legislation. The court verdict will be final and binding for all parties.

Figure 7: Grievance Redress Mechanism



186. **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 PCO

office, municipal office, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

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

188. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at municipal level; while costs related to escalated grievances will be met by the PCO. Cost estimates for grievance redress are included in resettlement cost estimates.

D. Staffing Requirement and Budget

189. Costs required 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.

190. For budgeting purposes, it is assumed that all new subprojects will be classified by ADB as category B (requiring IEE), and that the report will be deemed satisfactory by DOE. Some subprojects may require a simpler environmental review, but this is discounted for budgeting purposes. MOUD will aim to produce a single document that is acceptable to both ADB and the government to avoid duplication of effort, and the documents produced by the PPTA will be used as a guide.

191. Each of the IEEs prepared to date involved approximately 2 weeks of effort by an experienced environmental specialist conducting the following activities: (i) site visit to assess environmental conditions and potential impacts of the scheme; (ii) liaison with the city corporation and others to obtain any environmental/social data that might be available locally (e.g. population figures, designated sites, etc.); (iii) consultation with the local community to inform them about the scheme and identify their views and concerns; (iv) assessment of impacts and development of mitigation; and (v) desk study and report preparation.

192. The infrastructure involved in each scheme is generally straightforward and will take between 3 and 9 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 DSC environment specialists under supervision of PCO.

193. 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.

194. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of the PIUs. All monitoring during the operation and maintenance (O&M) phase will be conducted by MOUD and PIUs; therefore, there are no additional costs.

X. CONCLUSION

195. Overall, the impacts of the project will be very positive, befitting the environment and the people. Some negative impacts are anticipated during implementation but in specific areas and for short duration (dust, noise, traffic problems, access to buildings, etc.). It is expected that the adverse environmental impacts of the planned subproject will in general not be significant and can be easily and reasonably mitigated and prevented through mitigation measures and regular monitoring during the design, construction and operation phases.

196. If the project is properly implemented and environmental issues are duly considered, there will be a significant improvement in the health of the environment and people due to the proposed subproject, and thereby an improvement in the quality of life. In addition, local people will get direct employment as workers, which will contribute significantly improving their livelihood. These benefits from the implementation of the proposed road subproject are more significant and long term in nature compared to the adverse impacts, most of which can be mitigated or avoided. Moreover, relevant issues raised during public consultation have also been addressed.

197. The IEE has shown that none of the anticipated environmental impacts of constructing and improving the drainage and road are significant enough to need a detail follow-up EIA or a special environmental study. Therefore, this IEE is sufficient for the implementation of the sub-project.

APPENDIX 1: DRAINAGE: RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Instructions:

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

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

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

Country/Project Title: **NEP: Preparing the Integrated Urban Development Project**

Screening Questions	Yes	No	Remarks
A. PROJECT SITING IS THE PROJECT AREA:			
1. Densely populated?	x		The municipality has a population density of 6,000 people per km^2.
2. Heavy with development activities?		x	It is a commercial hub for the midwestern development region.
3. Adjacent to or within any environmentally sensitive areas?			
1. Cultural heritage site	x		Only the surroundings of the Bageshwari Temple are annually flooded, and drainage improvements will solve this problem.
2. Protected area		x	
3. Wetland		x	
4. Mangrove		x	
5. Estuarine		x	
6. Buffer zone of protected area		x	
7. Special area for protecting biodiversity		x	
8. Bay		x	
B. POTENTIAL ENVIRONMENTAL IMPACTS WILL THE PROJECT CAUSE:			
1. Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services?		x	A sanitary landfill site and septage drying beds are included in the project.

Screening Questions	Yes	No	Remarks
2. Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		x	The project will enhance the existing environmental conditions of the areas. Good construction practices will be specified in the EMP so as to deter deterioration of existing environmental conditions.
3. Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds, and forests)?		x	Not applicable
4. Dislocation or involuntary resettlement of people?		x	The existing roads are to be improved and rehabilitated.
5. Disproportionate impacts on the poor, women and children, indigenous peoples, or other vulnerable group?		x	Not applicable. The subproject will, in fact, be beneficial because of improved roads with job opportunities.
6. Degradation of cultural property and loss of cultural heritage and tourism revenues?		x	No cultural property and heritage sites lie along the existing roads which are to be rehabilitated.
7. Occupation of low-lying lands, floodplains, and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutant industries?		x	Not applicable
8. Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters)?		x	Not applicable
9. Air pollution due to urban emissions?	x		Air pollution due to dust and construction vehicles during rehabilitation of the roads will occur, but mitigation measures will be mentioned in the EMP.
1. Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	x		Risks and vulnerability during construction and operation are temporary, reversible, and short-term in duration. The EMP will include mitigation measures related to occupational health and safety.
2. Road blocking and temporary flooding due to land excavation during rainy season?	x		A traffic management plan will form part of the EMP so that roadblocks are minimized. Excavation during the rainy season will be avoided.
3. Noise and dust from construction activities?	x		Good construction practice to mitigate noise and dust pollution will be part of the EMP.

Screening Questions	Yes	No	Remarks
4. Traffic disturbances due to construction material transport and wastes	x		A traffic management plan will form part of the EMP so that roadblocks are minimized.
5. Temporary silt runoff due to construction?	x		Good construction practices to mitigate soil erosion and silt runoff will be part of the EMP.
6. Hazards to public health due to ambient, household, and occupational pollution, thermal inversion, and smog formation?		x	Not applicable
7. Water depletion and/or degradation?		x	Not applicable
8. Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		x	Not applicable
9. Contamination of surface and ground waters due to improper waste disposal?		x	A sanitary landfill disposal site and septage drying beds will be provided.
10. Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		x	A sanitary landfill disposal site and septage drying beds will be provided so the drains will not be polluted.
11. Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	As only rehabilitation of drains will be done, a large number of construction workers will not be necessary. The local labor available will suffice.
12. Social conflicts if workers from other regions or countries are hired?		x	As only rehabilitation of drains will be done, a large number of construction workers will not be necessary. The local labor available will suffice.
13. Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel, and other chemicals during operation and construction?		x	Not applicable
14. Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation, and decommissioning?	x		The EMP will include mitigation measures related to occupational health and safety.

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**

1. Is the project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami, or volcanic eruptions and climate changes?	x		The project area is prone to annual floods, and the drainage subproject will remedy the existing problems.
2. Could changes in temperature, precipitation, or extreme events patterns over the project lifespan affect technical or financial sustainability (e.g., increased extreme rainfall increases flooding, damaging proposed infrastructure)?		x	The design of the drainage system will consider the worst flooding scenario.
3. Are there any demographic or socioeconomic aspects of the project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		x	Not applicable
4. Could the project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by paving vulnerable groundwater recharge areas, or using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?		x	Not applicable

APPEDIX 2: URBAN DEVELOPMENT: REHABILITATION OF CITY ROADS: RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Instructions:

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

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

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

Country/Project Title: **NEP: Preparing the Integrated Urban Development Project**

Scope. The proposed subproject would mainly be an upgrading of existing roads, (width of lanes according to importance of the road, lateral drainage and footpaths, street lighting in core areas). Some of the roads are proposed not only for improvement, but also for at least partial realignment (straightening of "meandering" roads), which may require construction of a new road. The roads and drainages will be developed in accordance with the following site selection and environmental criteria.

(i) For new roads and/or drainages, alignments should avoid cultural heritage site, protected area, wetland, mangrove, estuarine, buffer zone of protected area, and special area for protecting biodiversity.
(ii) Include the provision of new or improved storm water drainage to remove the increased runoff caused by increasing the road surface area.
(iii) 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.
(iv) Include provision for installation of regulator to control inflow/ outflow through drain to prevent backflow of water through drain (e.g., due to high water level at downstream discharge point, such as khal/ river)
(v) Include measures to avoid pollution of downstream water body due to disposal of polluted water from drainages.

Screening Questions	Yes	No	Remarks
A. Project siting **Is the project area…**			
• Densely populated?		✓	The population of Siddharthanagar is 73,000
• Heavy with development activities?		✓	
Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site		✓	
• Protected Area		✓	
• Wetland		✓	
• Mangrove		✓	
• Estuarine		✓	
• Buffer zone of protected area		✓	
• Special area for protecting biodiversity		✓	
B. Will Potential Environmental Impacts the Project cause…			

Screening Questions	Yes	No	Remarks
• encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	Not applicable.
• encroachment on precious (e.g. sensitive or ecology protected areas)?		✓	Not applicable.
• alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?	✓		Excavations may result in silt-laden runoff during rainfall which may cause siltation and reduction in the quality of adjacent bodies of water. The impacts are negative but temporary, short-term, site-specific and not significant within a relatively small area and reversible through mitigation measures specified in the EMP.
• deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	✓		Run-off during construction will be more and anticipated during construction activities. The impacts are negative but temporary, short-term, site-specific and not significant within a relatively small area and reversible through mitigation measures specified in the EMP. Construction contractors will be prohibited from stockpiling loose materials along drain channels and will be required to immediately dispose of any waste materials.
• increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?		✓	Not anticipated.
• risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?		✓	Not applicable. Construction will not involve use of explosives and chemicals. Excavation will be done manually. Construction contractors will be required to implement health and safety (H&S) plan.
• noise and vibration due to blasting and other civil works?	✓		Anticipated during construction activities. The impacts are negative but temporary, short-term, site-specific and not significant within a relatively small area and reversible through mitigation measures specified in the EMP.
• dislocation or involuntary resettlement of people?		✓	Not applicable. Land acquisition not required for the subprojects. RF to guide any resettlement related issues.
• dislocation and compulsory resettlement of people living in right-of-way?		✓	Resettlement plan prepared as per ADB SPS and Government of Nepal laws.
• disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Not applicable.
• other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	Not applicable.
• hazardous driving conditions where construction interferes with pre-existing roads?		✓	Not anticipated. Construction contractors will be required to implement traffic management plan and coordinate with local authority.

Screening Questions	Yes	No	Remarks
• poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?		✓	Not anticipated. Construction contractors will be required to provide sanitation facilities and ensure proper waste management at all times. Contracts will include provisions on STI and HIV/ AIDS.
• creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		✓	Not anticipated. Construction contractors will be required to ensure cleanliness at all times to prevent breeding of mosquitoes and rodents.
• accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?		✓	Not applicable.
• increased noise and air pollution resulting from traffic volume?		✓	Not anticipated.
• increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		✓	Not anticipated.
• social conflicts if workers from other regions or countries are hired?		✓	Priority in employment will be given to local residents.
• large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Improved management systems through capacity building and institutional development will ensure reduced burden on services and infrastructure.
• risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		✓	Not applicable. Construction will not involve use of explosives and chemicals.
• community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning		✓	Work areas will be clearly demarcated with signage and safety barriers, and access will be controlled. Only workers and project concerned members will be allowed to visit the operational sites.

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**
1. Is the project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami, or volcanic eruptions and climate changes (see Appendix I)?	x		The project area is prone to annual floods, and the drainage and road subproject will remedy the existing problems.
2. Could changes in temperature, precipitation, or extreme events patterns over the project lifespan affect technical or financial sustainability (e.g., increased extreme rainfall increases flooding, damaging proposed infrastructure)?		x	The design of the road drainage system will consider the worst flooding scenario.
3. Are there any demographic or socioeconomic aspects of the project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		x	Not applicable

4. Could the project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by paving vulnerable groundwater recharge areas, or using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?		x	Not applicable

APPENDIX 3: SAMPLE OUTLINE SPOILS MANAGEMENT PLAN

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 disposal

APPENDIX 4: 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:

(i) the safety of pedestrians, bicyclists, and motorists traveling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties; and
(v) 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 A4.2 to Figure A4.12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the impact due to street closure

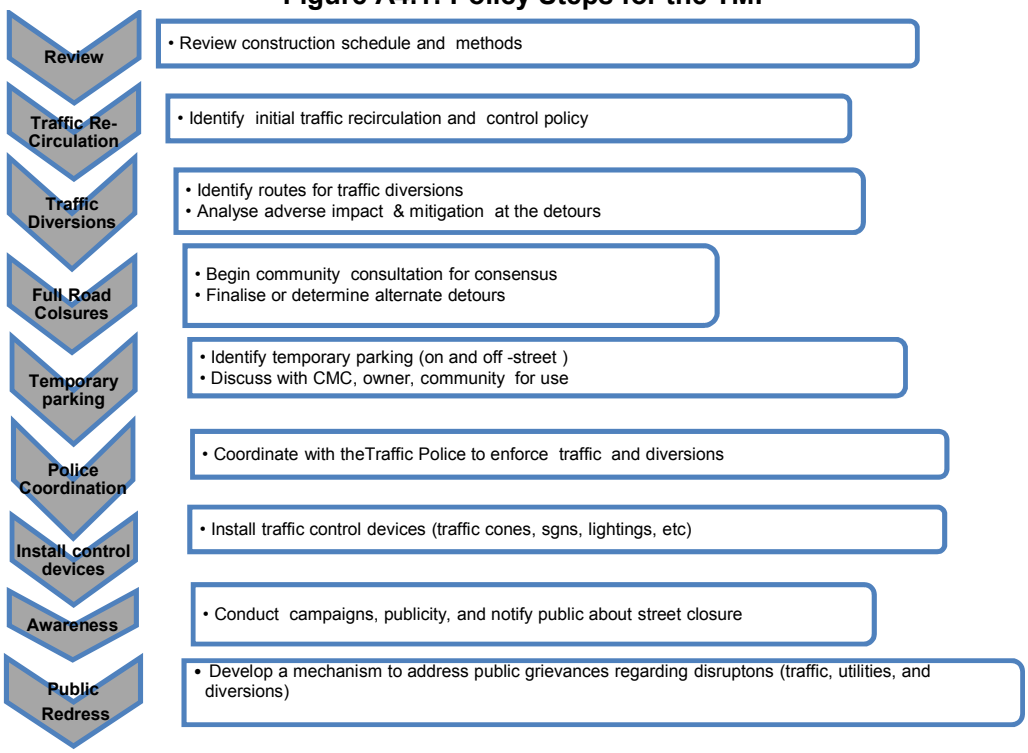
4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(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 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 A4.1: 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 centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

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

E. 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:

(i) Signs
(ii) Pavement Markings
(iii) Channelizing Devices
(iv) Arrow Panels
(v) 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 A4.2 to Figure A4.12** 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:

(i) Work on shoulder or parking lane
(ii) Shoulder or parking lane closed on divided road
(iii) Work in Travel lane
(iv) Lane closure on road with low volume
(v) Lane closure on a two-line road with low volume (with yield sign)
(vi) Lane closure on a two-line road with low volume (one flagger operation)
(vii) Lane closure on a two lane road (two flagger operation)
(viii) Lane closure on a four lane undivided Road
(ix) Lane closure on divided roadway
(x) Half road closure on multi-lane roadway
(xi) 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 LED 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 A4.2 and A4. 3: Work on Shoulder or Parking Lane and Shoulder or Parking Lane Closed on Divided Road

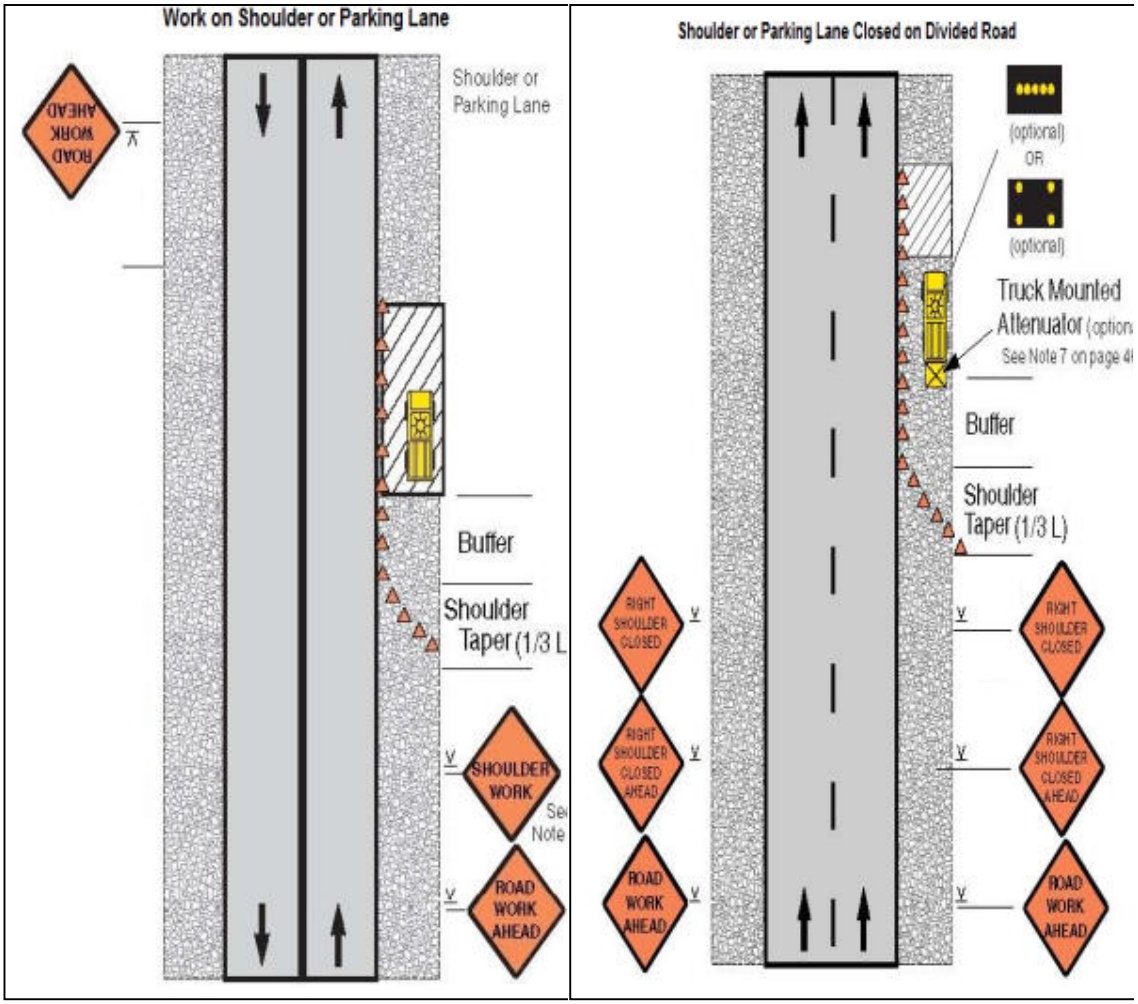

Work on Shoulder or Parking Lane
ROAD WORK AHEAD
Shoulder or Parking Lane
Buffer
Shoulder Taper (1/3 L
SHOULDER WORK
ROAD WORK AHEAD
Shoulder or Parking Lane Closed on Divided Road
(optional)
OR
(optional)
Truck Mounted Attenuator (option
See Note 7 on page 4
Buffer
Shoulder Taper (1/3 L)
RIGHT SHOULDER CLOSED
RIGHT SHOULDER CLOSED AHEAD
ROAD WORK AHEAD

Figure A4.4 and A4.5: Work in Travel Lane and Lane Closure on Road with Low Volume

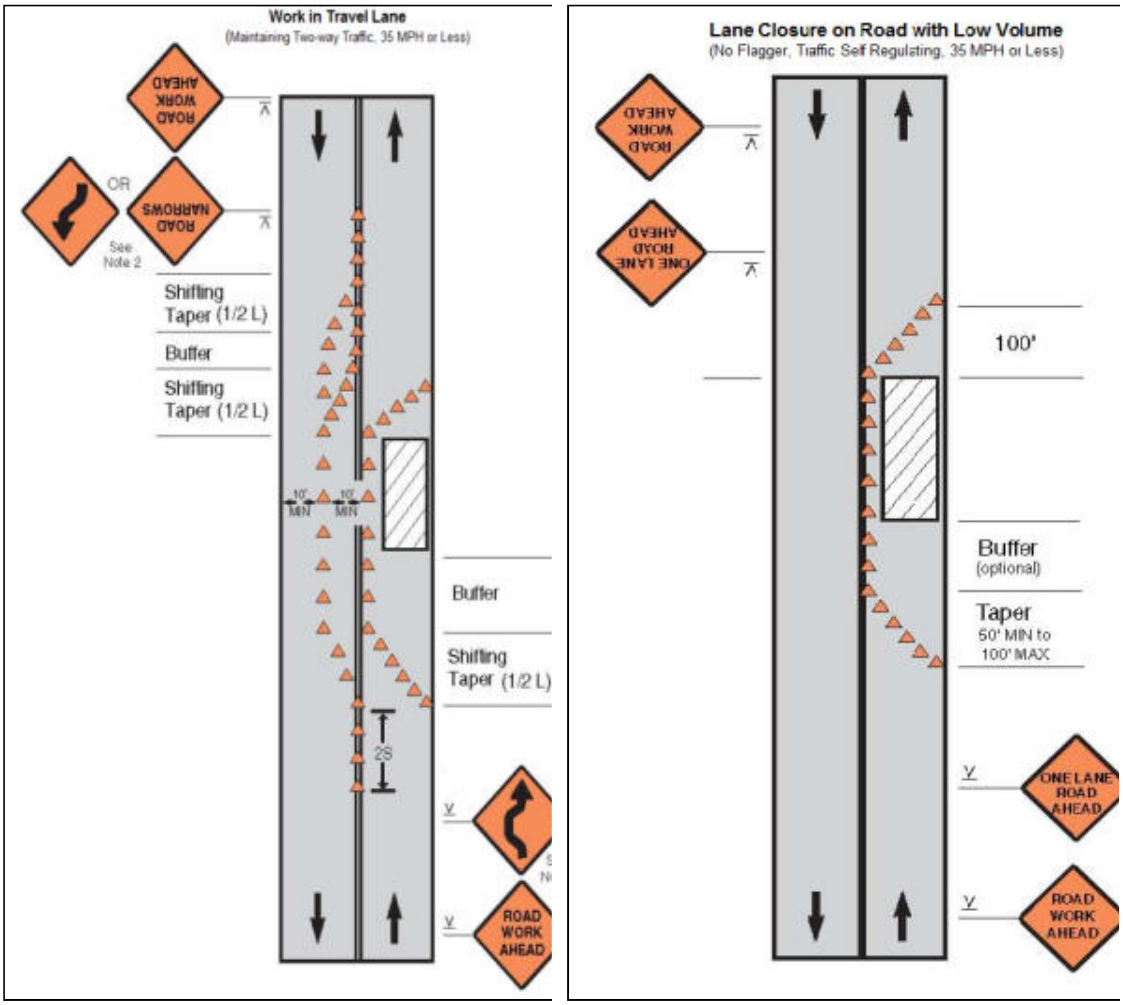
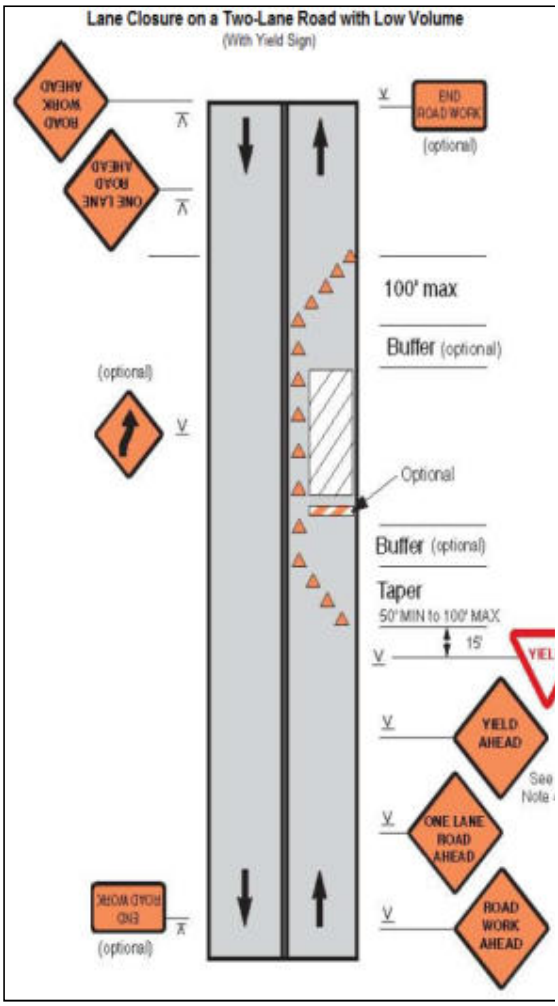


Figure A4.6 and A4.7: Lane Closure on a Two-line Road with Low Volume (with yield sign) and Lane Closure on a Two-line Road with Low Volume (one flagger operation)



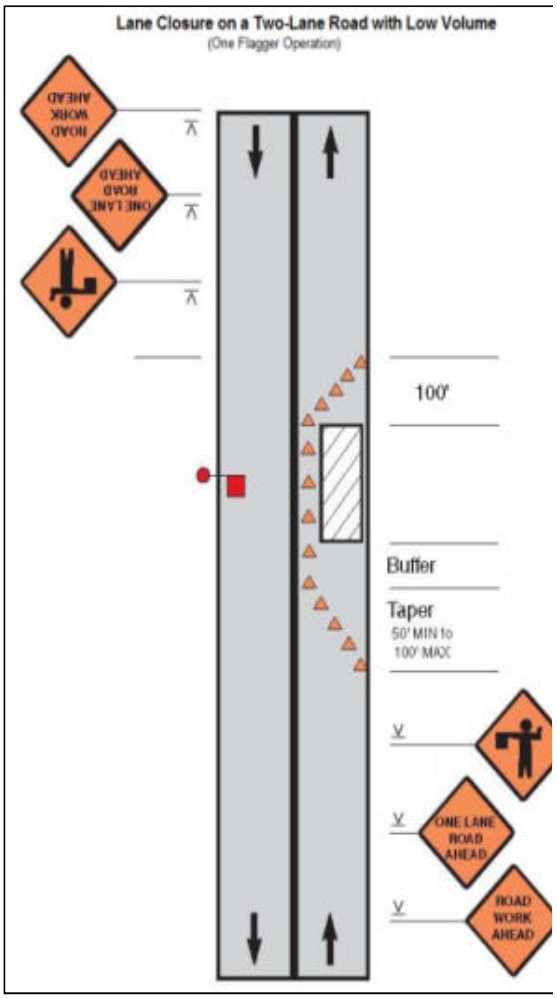


Figure A4.8 and A4.9: Lane Closure on a Two-Lane Road (Two Flagger Operation) and Lane Closure on a Four-Lane Undivided Road

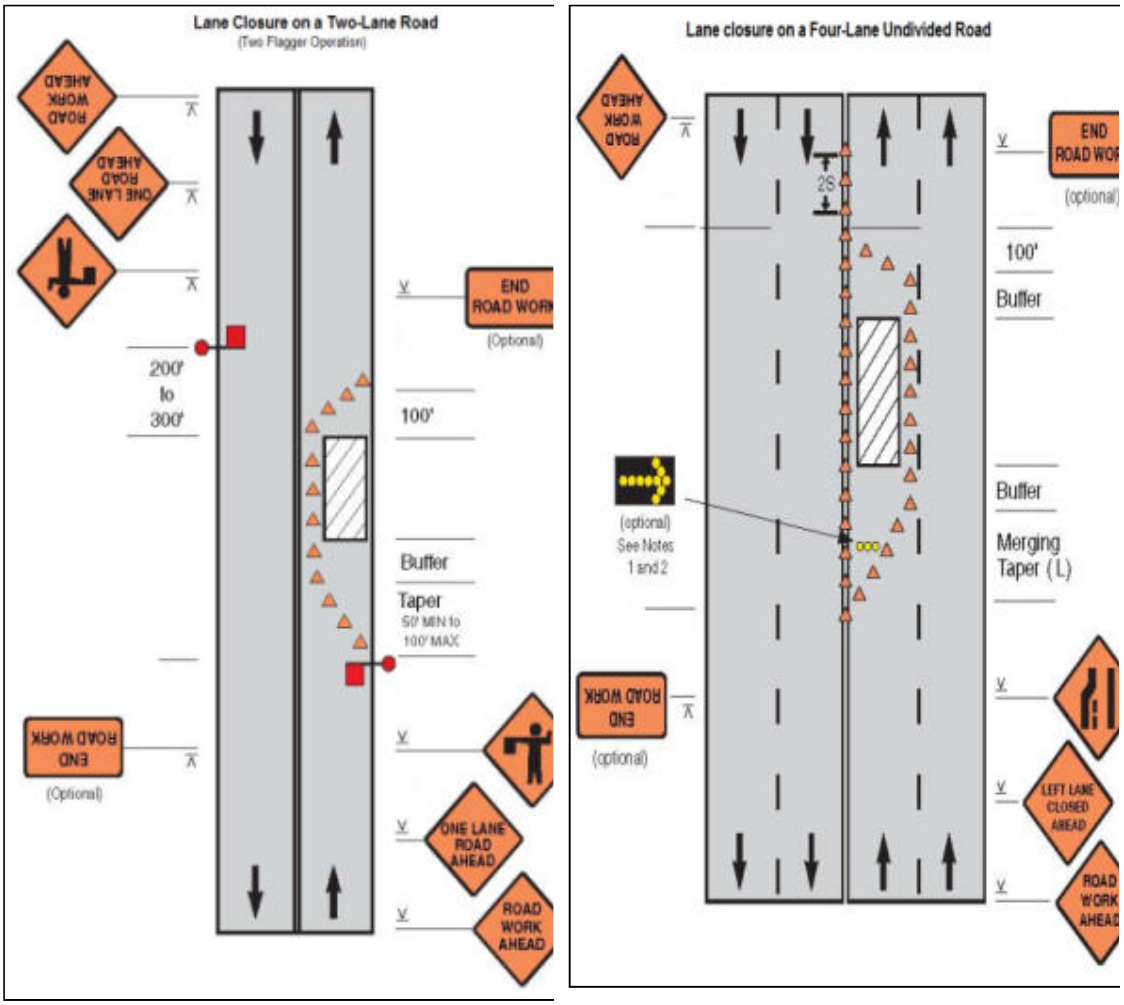


Figure A4.10 and A4.11: Lane Closure in Divided Roadway and Half Road Closure on Multi-Lane Roadway

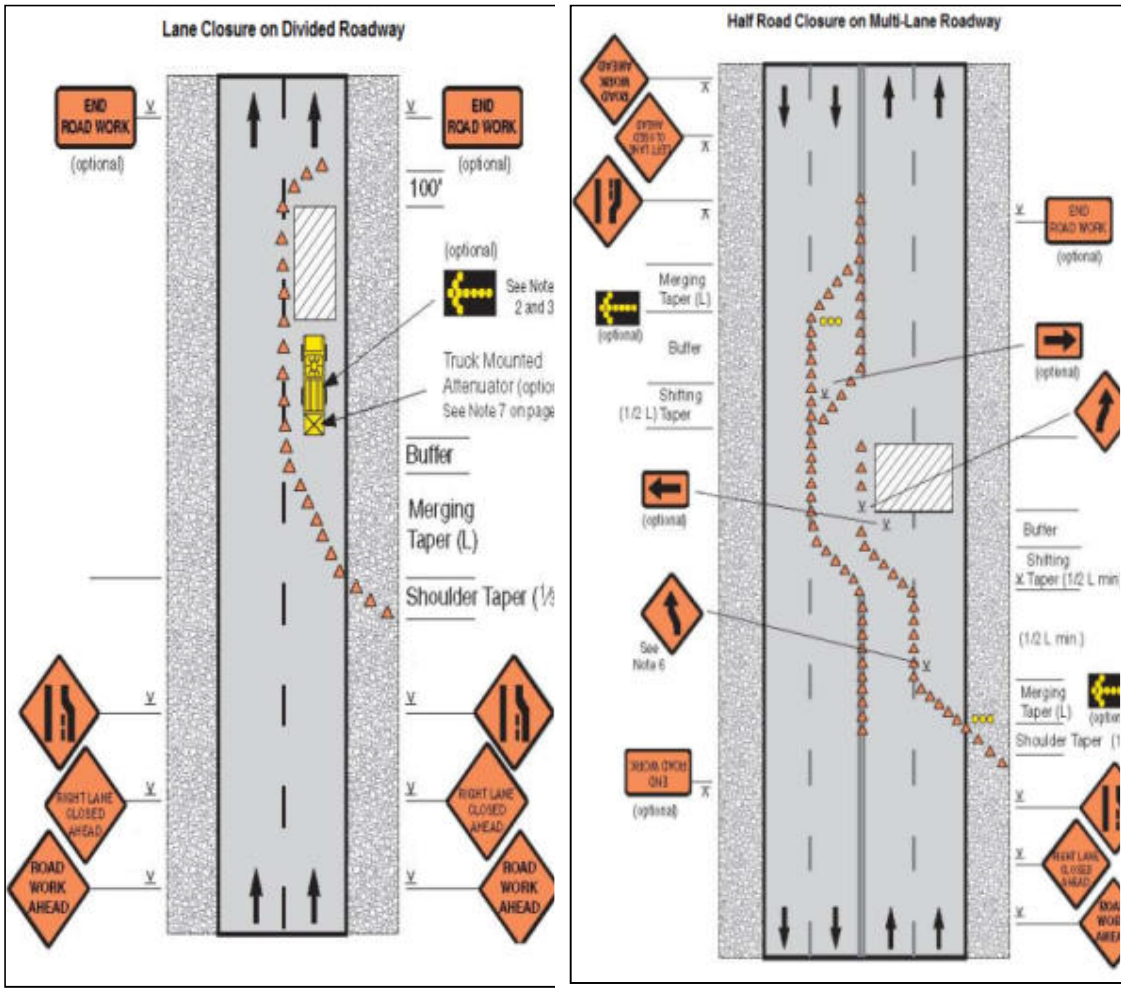
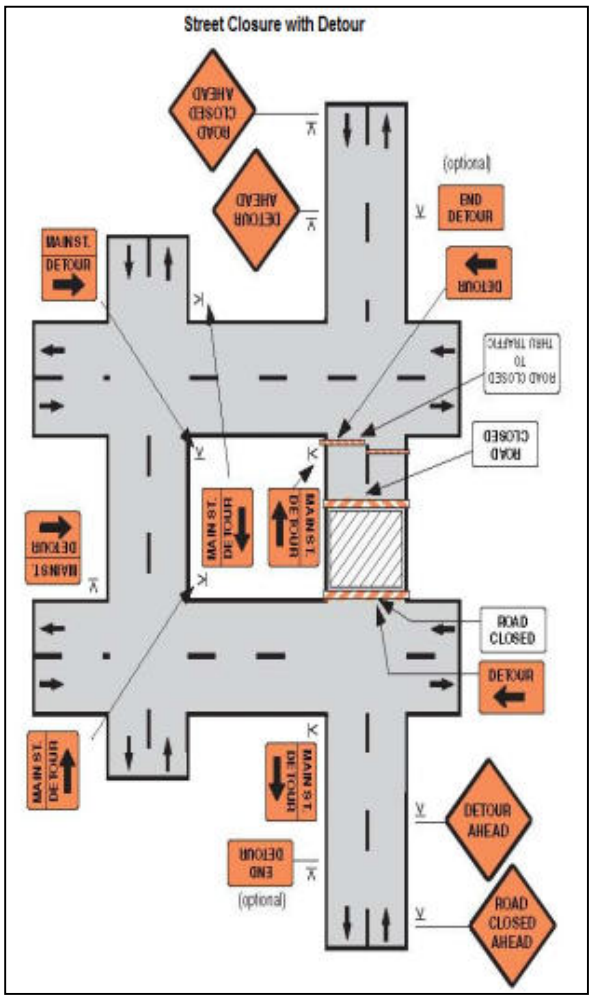


Figure A4.12: Street Closure with Detour



APPENDIX 5: NATIONAL AMBIENT AIR QUALITY STANDARDS FOR NEPAL

Parameters	Units	Averaging Time	Concentration in Ambient Air, maximum	Test Methods
TSP (Total Suspended Particulates)	µg/m^3	Annual	-	
		24 hours*	230	High volume sampling
PM_{10}	µg/m^3	Annual	-	
		24 hours*	120	Low volume sampling
Sulfur dioxide	µg/m^3	Annual	50	Diffusive sampling based on weekly averages
		24 hours**	70	
Nitrogen dioxide	µg/m^3	Annual	40	Diffusive sampling based on weekly averages
		24hours**	80	
Carbon monoxide	µg/m^3	8 hours**	10,000	
		15 minutes	100,000	Indicative samplers ***
Lead	µg/m^3	Annual	0.5	Atomic Absorption Spectrometry, analysis of PM_{10} samples****
		24 hours	-	
Benzene	µg/m^3	Annual	20	Diffusive sampling based on weekly averages
		24 hours	-	

***Note:** 24-hour values shall be met 95% of the time in a year. For 18 days per calendar year, the standard may be exceeded, but not on 2 consecutive days.

****Note:** 24-hour standards for NO_2 and SO_2 and 8-hour standard for CO are not to be controlled before MOPE has recommended appropriate test methodologies.

*****Note:** Control by spot sampling at roadside locations: minimum one sample per week taken over 15 minutes during peak traffic hours, i.e. in the periods of 8 a.m.–10 a.m. or 3 p.m.–6 p.m. on a workday.

******Note:** If representativeness can be proven, yearly averages can be calculated from PM10 samples from selected weekdays from each month of the year.

APPENDIX 6: RECOMMENDED NOISE EXPOSURE LIMITS FOR THE WORK ENVIRONMENT—ADOPTED FROM OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

S.No.	Noise Exposure (dB)	Permissible Exposure (Hours and Minutes)
1	85	16 hours
2	87	12 hours –18 minutes
3	90	8 hours
4	93	5 hours – 18 minutes
5	96	3 hours – 30 minutes
6	99	2 hours – 18 minutes
7	102	1 hour – 30 minutes
8	105	1 hour
9	108	40 minutes
10	111	26 minutes
11	114	17 minutes
12	115	15 minutes
13	118	10 minutes
14	121	6.6 minutes
15	124	4 minutes
16	127	3 minutes
17	130	1 minute

Source: March, 1991.

Recommended Average Equivalent Sound Levels for Protecting the Public Health and Welfare

S.No.	Land Use	Measure	To Protect Against Activity Interference and Hearing Loss Effects (dB)
1.	Residential including farm residences	Leq (24)	55
2.	Commercial	Leq (24)	70
3.	Hospitals	Leq (24)	55
4.	Industrial	Leq (24)	70
5.	Educational	Leq (24)	55
6.	Recreational areas	Leq (24)	70
7.	Farmland and general unpopulated land	Leq (24)	70

Source: U.S. Environmental Protection Agency, 1974.
Note: Leq (24) = Equivalent sound level in decibels for 24 hours.

APPENDIX 7: NEPAL VEHICLE MASS EMISSION STANDARD, 2056 (1999)

A. Vehicles Fuelled with Gasoline (Positive Ignition Engines)

1. For passenger cars with up to six seats and gross vehicle weight (GVW) less than 2.5tons

1.1 Type 1 Test–Verifying exhausts emissions after a cold start

	Grams per km	
	Carbon monoxide (CO)	**Hydrocarbons plus oxides Of Nitrogen (HC+NOx)**
Type approval*	2.72	0.97
Conformity of production**	3.16	1.13

Note: The test shall be as per the driving cycle adopted by different countries, with cold start on chassis dynamometer.

1.2 **Type II Test–Carbon monoxide emission at idling speed.** This test applies to vehicles fuelled with leaded gasoline only. The carbon monoxide content by volume of exhaust gases emitted with engines idling must not exceed 3.5% at the settings used for the Type I test.

1.3 **Type III Test–Verifying emissions of crank case gases.** The crank case ventilation system must not permit the emission of any of the crank case gases into the atmosphere.

1.4 **Type IV Test–Determination evaporative emission.** This test applies to all vehicles fuelled with leaded and unleaded gasoline. Evaporative emissions shall be less than 2g/test.

1.5 **Type V Test–Durability of pollution control devices.** This test applies to vehicles fuelled with unleaded gasoline only. The test represents an endurance test of 80,000km driven on the road or on a chassis dynamometer.

Not with standing the above requirements, a manufacturer may choose to use the deterioration factors from the following table:

Deterioration Factor	
CO	HC+NOx
1.2	1

2. For light-duty commercial vehicles with gross vehicle weight (GVW) less than or equal to 3.5tons.

2.1 Type 1 Test–Verifying exhausts emissions after a cold start

Reference mass (kg)		**Grams per km**	
		Carbon monoxide(CO)	**Hydrocarbons plus oxides Of nitrogen(HC+NOx)**
RM<1250	Type approval	2.72	0.97
	Conformity of	3.16	1.13
	production		
1250<RM<1700	Type approval	5.17	1.4
	Conformity of	6.0	1.6
	production		
RM>1700	Type approval	6.9	1.7
	Conformity of	8.0	2.0

	production		

Note: The test shall be as per the driving cycle adopted by different countries, with cold start on chassis dynamometer. Reference mass means the "unladen mass" (mass of the vehicle in running order without crew, passengers, or load, but with the fuel tank full and the usual set of tools and spare wheel on board, when applicable) of the vehicle increased by a uniform figure of 100kg. Includes passenger vehicles with seating capacity more than six persons or reference mass more than 2,500kg.

2.2 **Type II Test–Carbon monoxide emission at idling speed.** This test applies to vehicles fuelled with leaded gasoline only. The carbon monoxide content by volume of the exhaust gases emitted with engines idling must not exceed 3.5% at the settings used for the Type I test.

2.3 **Type III Test–Verifying emissions of crank case gases.** The crank case ventilation system must not permit the emission of any of the crank case gases into the atmosphere.

2.4 **Type IV Test–Determination of evaporative emission.** This test applies to all vehicles fuelled with leaded and unleaded gasoline. Evaporative emissions shall be less that 2g/ test.

2.5 **Type V Test–Durability of pollution control devices.** This test applies to Vehicles fuelled with both leaded and unleaded gasoline. The test represents an endurance test of 80,000km driven on the road or on a chassis dynamometer.

Not with standing the above requirements, a manufacturer may choose to use the deterioration factors from the following table:

Deterioration	
CO 1.2	HC+NOx 1.2

3. **For two-wheelers and three-wheelers**

3.1 **Type I Test–Verifying exhaust emissions after a cold start**

	CO(grams/km)		**HC+NOx (grams/kilometer)**	
	2-wheeler	3-wheeler	2-wheeler	3-wheeler
Type approval	2.0	4.0	2.0	2.0
Conformity of	2.4	4.8	2.4	2.4
production				

Note: The test shall be as per the driving cycle adopted by different countries, with cold start on chassis dynamometer.

3.2 **Type II Test–Carbon monoxide emission at idling speed**. This test applies to vehicles fuelled with leaded gasoline only. The carbon monoxide content by volume of the exhaust gases emitted with engines idling must not exceed 3.5% at the settings used for the Type I test.

3.3 **Type III Test–Verifying emissions of crank case gases.** The crank as eventilation system must not permit the emission of any of the crank case gases into the atmosphere.

Not applicable for two-wheelers.

3.4 **Type I V Test–Determination of evaporative emission.** This test applies to vehicles fuelled with leaded and unleaded gasoline. Evaporative emissions shall be less than 2g/ test.

Not applicable for two wheelers

3.5 **Type V Test–Durability of pollution control devices.** This test applies to vehicles

fuelled with unleaded gasoline only. The test represents an endurance test of 80,000km driven on the road or on a chassis dynamometer.

Not with standing the above requirements, a manufacturer may choose to use the deterioration factors from the following table:

Deterioration Factors	
CO 1.2	HC+NOx 1.2

Note: In case of two-wheelers, this test is only applicable if fitted with antipollution devices.

B. Vehicles Fueled with Diesel (Compression Ignition Engines)

1. **For passenger cars with upto six seats and gross vehicle weight (GVW) less than 2.5 tons**

1.1 **Type 1 Test–Verifying exhaust emissions after a cold start**

		Grams per km	
	CO	HC+ NOx	PM(Particulate Matter)
Type approval	2.72	0.97	0.14
Conformity of production	3.16	1.13	0.18

Note: The test shall be as per the driving cycle adopted by different countries, with cold start on chassis dynamometer.

1.2 **Type II Test–Carbon monoxide emission at idling speed**
Not applicable

1.3 **Type III Test–Verifying emissions of crank case gases**
Not applicable

1.4 **Type IV Test–Determination of evaporative emission**
Not applicable

1.5 **Type V Test–Durability of pollution control devices**. The test represents an endurance test of 80,000km driven on the road or on a chassis dynamometer.

Not with standing the above requirements, a manufacturer may choose to use the deterioration factors from the following table:

Deterioration Factors		
CO 1.1	HC+NOx 1.0	PM 1.2

2. **For light-duty commercial vehicles with gross vehicle weight (GVW) less than or equal to 3.5tons.**

2.1 **Type1 Test–Verifying exhausts emissions after a cold start**

Reference mass (kg)		Grams per km	
		Carbon monoxide(CO)	Hydrocarbons plus oxides of nitrogen (HC+NOx)
RM<1250	Type approval	2.72	0.97
	Conformity of	3.16	1.13
	production		

Reference mass (kg)		Grams per km	
		Carbon monoxide(CO)	Hydrocarbons plus oxides of nitrogen (HC+NOx)
1250<RM<1700	Type approval	5.17	1.4
	Conformity of	6.0	1.6
	production		
RM>1700	Type approval	6.9	1.7
	Conformity of	8.0	2.0
	production		

Note: The test shall be as per the driving cycle adopted by different countries, with cold start on chassis Dynamometer. Reference mass means the "unladen mass" (mass of the vehicle in running order without crew, passengers, or load, but with the fuel tank full and the usual set of tools and spare wheel on board, when applicable) of the vehicle increased by a uniform figure of 100kg. includes passenger vehicles with seating capacity of more than six persons or reference mass more than 2500kg.

2.2 **Type II Test–Carbon monoxide emission at idling speed**
Not applicable

2.3 **Type III Test–Verifying emissions of crank case gases**
Not applicable

2.4 **Type IV Test-determination of evaporative emission**
Not applicable

2.5 **Type V Test–Durability of pollution control devices**

The test represents an endurance test of manufacturer, who may choose to use the deterioration from the following table:

Deterioration Factors		
CO	HC+NOx	PM
1.1		1.2

3. **For heavy-duty vehicles and vehicles with gross vehicle weight (GVW) more than 3.5tons**

3.1 **Type I Test–Verifying exhausts emissions after a cold start**

Pollutants	Type approval	Conformity of production
CO (grams per KWH)	4.5	4.9
HC (grams per KWH)	1.10	1.23
NOx (grams per KWH)	8.0	9.0
PM (grams per KWH) for engines with power less than 85KW	0.61	0.68
PM(grams per KWH) for Engines with power more than 85KW	0.36	0.40

Note: The test shall be as per the test driving cycle adopted by different countries with 13 mode emissions engines dynamometer test.

3.2 **Type II Test–Carbon monoxide emission at idling speed**
Not applicable

3.3 **Type III Test–Verifying emissions of crank case gases**
Not applicable

3.4 **Type IV Test–Determination of evaporative emission**
Not applicable

3.5 **Type V Test–Durability of pollution control devices**
Not applicable

Note:
* Please see the explanatory note
** Please see the explanatory note
 As mentioned by the decision of HMG/N of 2056.12.02
 As added by the decision of the HMG/N of 2056.12.02

C. Explanatory Notes

1. Type approval: Most countries require some form of certification or type approval by the vehicle manufacturer to demonstrate that each new vehicle old is capable of meeting applicable emission standards. Usually, type approval requires emission testing of prototype vehicles representative of planned production vehicles. Under ECE and Japanese regulations, such compliance is required only for new vehicles. U.S. regulations require that vehicles comply with emission standards throughout their useful lives when maintained according to the manufacturing specifications.

2. The advantage of a certification or type approval program is that it can influence vehicle design prior to mass production. It is more cost-effective because the manufacturers identify and correct the problems before production actually begins.

3. Approval of a vehicle: Vehicle manufacturers apply for approval of a vehicle type with regard to exhaust emissions, evaporative emissions, and durability of pollution control devices to the authority responsible for conducting the tests. The application for approval also includes details like description of engine type comprising all the particulars, drawings of the combustion chamber and of the piston, descriptions of pollution control devices, etc. If the vehicle type submitted for approval meets the requirements of various types of tests mentioned, only then is the approval of that vehicle granted.

4. Conformity of production: The conformity of production is an assembly line testing system. The objectives of assembly line testing are to enable regulatory authorities to identify certified production vehicles that do not comply with applicable emission standards, to take remedial actions (such as revoking certification and recalling vehicles) to correct the problem, and to discourage the manufacture of non-complying vehicles. This test provides an additional check on mass-produced vehicles to assure that the designs found adequate in certification are satisfactorily translated into production, and that quality control on the assembly line is sufficient to provide reasonable assurance that vehicles in use meet standards. The basic difference between TA and COP is that TA is based on proto type vehicle or design of the vehicle, while COP measures emissions from real production vehicles.

5. As per the requirements set forth by the European Union, a sufficient number of random checks are made of serially manufactured vehicles bearing the type approval mark of vehicles bearing all the types of tests mentioned above. The tolerance limits are provided for conformity of production in Type I test.

Source: GoN, Ministry of Science, Technology and Environment.

APPENDIX 8: RECOMMENDED STANDARDS FOR VIBRATION FROM CONSTRUCTION SITES

Type of Restriction	Area Classified	
Standard value	I and II	85 dB
Work prohibited time	I	7 p.m.–7 a.m.
	II	10.00 P.M. - 6.00 A.M.
Maximum working duration	I	10 hours per day
	II	14 hours per day
Maximum consecutive working days	I and II	6 days
Working prohibited days	I and II	Saturdays and holidays

Source: Vibration Regulation Law 64 of 1976, Japan

Notes:

1. Area I stands for areas to which one of the following descriptions applies:
   a. areas where maintenance of peace and quiet is particularly needed to preserve the residential environment
   b. areas which require maintenance of peace and quiet since they are needed for residential purposes
   c. areas for commercial and industrial as well as residential purposes which need measures to prevent vibration pollution
   d. the neighborhood of schools, hospitals, and the like
2. Area II stands for areas where there is a need to preserve the living environment of inhabitants, other than Area I.
3. Vibration level shall be measured at the boundary line of the specified construction work site.

Recommended Limits for Road Traffic Vibration

Area	Daytime	Night time	Applicable areas
I	65 dB	60 dB	Areas where maintenance of quiet is particularly needed to preserve a good living environment, and where quiet is called for us as they are used for residential purpose.
II	70 dB	65 dB	Areas for commercial and industrial as well as residential purposes, where there is a need to preserve the living environment of local inhabitants, and areas mainly serving industrial proposes which are in need of measures to prevent the living environment of local residents from deteriorating.

Source: Vibration Regulation Law 64 of 1976, Japan.
Note: Vibration level shall be measured at the boundary line of the road.

APPENDIX 9: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Nepali and English)

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

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

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

APPENDIX 10: SAMPLE SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

I. INTRODUCTION

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/ Office	Email Address	Contact Number	Roles
1. PMU				
2. PIUs				
3. Consultants				

- Overall project and subproject progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/ Detailed Design/ On-going Construction/ Completed/O&M)[1]	If On-going Construction	
				%Physical Progress	Expected Completion Date

[1] If ongoing construction, include %physical progress and expected date of completion.

II. COMPLIANCE STATUS WITH NATIONAL/ STATE/ LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS[2]

Package No.	Subproject Name	Statutory Environmental Requirements[3]	Status of Compliance[4]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[5]

III. COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

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

IV. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT PLAN (REFER TO EMP TABLES IN APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

[2] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.
[3] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)
[4] Specify if obtained, submitted and awaiting approval, application not yet submitted
[5] Example: Environmental Clearance requires ambient air quality monitoring; and Forest Clearance/ Tree-cutting Permit requires 2 trees for every tree, etc.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)[6]

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

Overall Compliance with CEMP/ EMP

[6] Attach Laboratory Results and Sampling Map/ Locations.

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

V. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Briefly describe the approach and methodology used for environmental monitoring of each subproject.

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

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:

    (i) Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s;
    (ii) Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
    (iii) Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain.
    (iv) Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
    (v) Confirm spill kits on site and site procedure for handling emergencies.
    (vi) Identify any chemical stored on site and provide information on storage condition. Attach photograph.
    (vii) Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
    (viii) Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
    (ix) Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
    (x) Indicate if there are any activities being under taken out of working hours and how that is being managed.

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

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

Air Quality Results

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

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

Water Quality Results

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

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

Noise Quality Results

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

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

VII. GRIEVANCE REDRESS MECHANISM

- Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

VIII. COMPLAINTS RECEIVED DURING THE REPORTING PERIOD

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

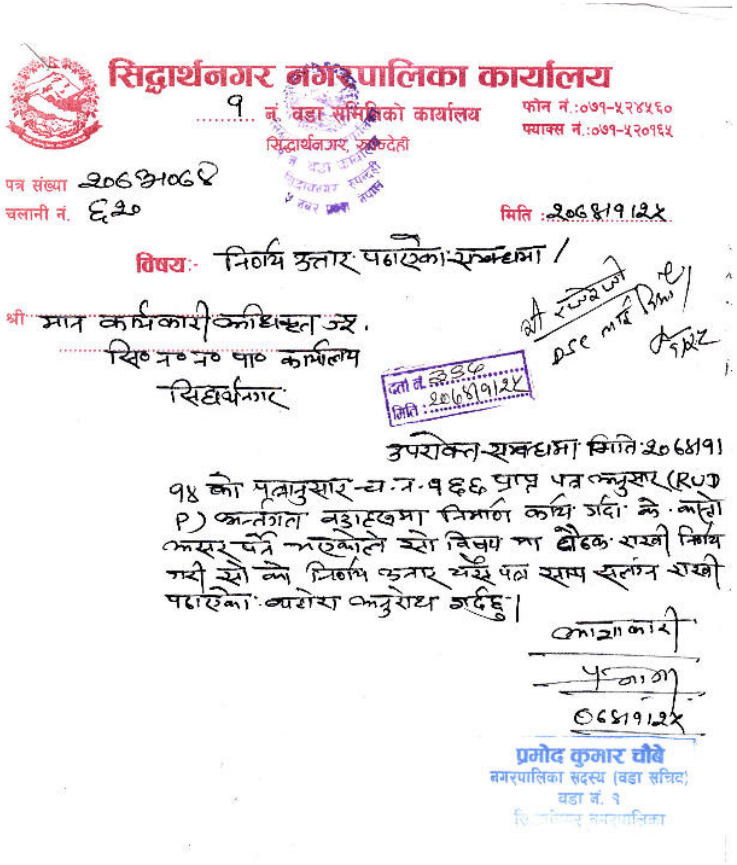
IX. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

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

X. APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors
- Others

ANNEX- 11:
STAKEHOLDER CONSULTATION / FOCUSED GROUP MEETING – MINUTES OF MEETING / PHOTOGRAPHS



सिद्धार्थनगर नगरपालिका कार्यालय
९ नं. वडा समितिको कार्यालय
सिद्धार्थनगर, रूपन्देही
फोन नं.:०७१-५२४५६०
फ्याक्स नं.:०७१-५२०१६५

पत्र संख्या २०६४/०६४
चलानी नं. ६२०
मिति :२०६४/१/२५

विषय:- निर्णय कपार पठाईका-सम्बन्धमा /

श्री मान कार्यकारी अधिकृत ज्यू,
सि० प्र० प० पा० कार्यालय
सिद्धार्थनगर

दर्ता नं. ६३८
मिति :२०६४/१/२५

उपरोक्त-सम्बन्धमा मिति:२०६४/१/१५ गते का पत्रानुसार च.नं.१६६ प्राप्त पत्र अनुसार (RUP P) अन्तर्गत नडाहरूमा निर्माण कार्य गर्दा के-के सामाग्री आवश्यक पर्ने भन्ने बारे यो विषय मा छलफल गरी निर्णय कपार पठाई पठाईका अनुरोध गर्दछु।

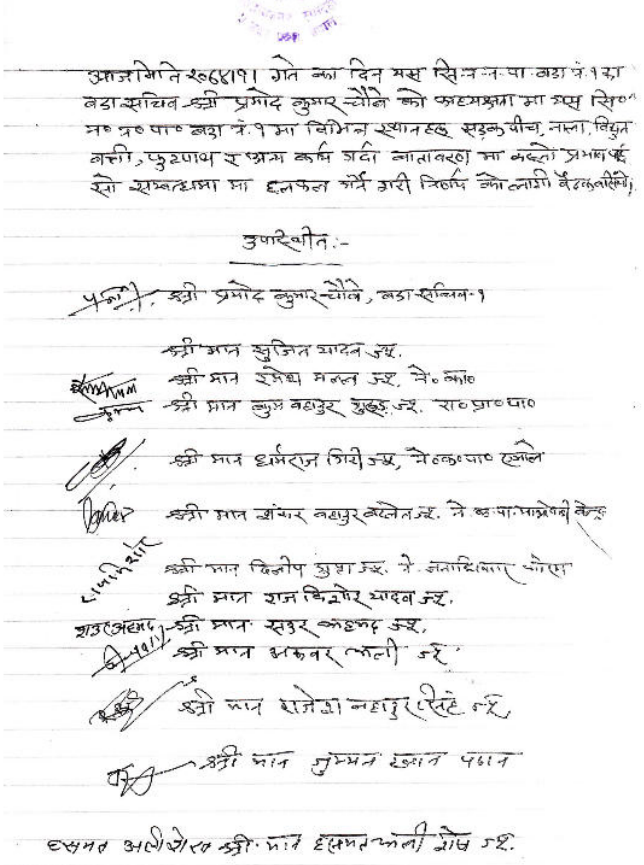
भवदीय
प्रमोद कुमार चौबे
०६४/१/२५

प्रमोद कुमार चौबे
नगरपालिका सदस्य (वडा सचिव)
वडा नं. १
सि० प्र० नगरपालिका

आजमिति २०६४।१। गते का दिन मस सिद्धार्थनगर पा वडा नं १ का वडा सचिव श्री प्रमोद कुमार चौबे को अध्यक्षता मा यस सि० प्र० प० पा० वडा नं १ मा विभिन्न स्थानस्थ सडक,पीच, नाला, विद्युत बत्ती, फुटपाथ र आम कर्मि जर्दा नातावरण मा भएको प्रभाव एवं सो सम्बन्धमा मा छलफल गर्दै जरी निर्णय भए अनुसारको देहायबमोजिम,

उपस्थित:-

१. श्री प्रमोद कुमार चौबे, वडा सचिव नं १
२. श्री मान सुजित यादव ज्यू,
३. श्री मान रमेश मल्ल ज्यू, ने० का०
४. श्री मान लुप बहादुर गुरुङ ज्यू, रा० प्र० प०
५. श्री मान धर्मराज गिरी ज्यू, ने० क० पा० एजेन्ट
६. श्री मान शंकर बहादुर थापा ज्यू, ने० क० पा० सदस्य
७. श्री मान दिनेश पुरा ज्यू, ने० नगरपालिका सदस्य
८. श्री मान राज किशोर यादव ज्यू,
९. श्री मान सत्तार अहमद ज्यू,
१०. श्री मान अकबर अली ज्यू,
११. श्री मान रामेश्वर बहादुर रेसी ज्यू,
१२. श्री मान सुमन खान पठान



उपस्थित अधिकांश श्री मान हसमत अली शेख ज्यू.

निर्णय:- आज मिति २०६४।७।३१ गते बस दिन बस सि.न.पा. वडा नं. १ मा सडक पीच, नाला, बिद्युत, फुटपाथ आदि हद गर्दा जनधनमा क्षतिपुर्ति गर्दा बस्ने कुरा मा सरोकारवाला हुन आएमा सरोकारवाला मा राम्रो किसिम कुरा हुने भएमा दोस्रो बोलाउने सरोकारवाला मा नबोलाउने पर्दैन भनी उपस्थित व्यक्तिहरु सकल गाडी निर्णय गरियो।

कार्यालय राजीमन्त्री

झाडफहमद

दस्तखत अनुपस्थित

सिद्धार्थनगर नगरपालिका कार्यालय

३ नं. वडा समितिको कार्यालय

सिद्धार्थनगर, रुपन्देही

फोन नं.:०७१-५२४५६०
फ्याक्स नं.:०७१-५२०१६५

पत्र संख्या ०६२।०६४
चलानी नं. ६२९

मिति :२०६४।१।२५

विषय:- जानकारी सम्बन्धमा।

श्री मान् कार्यकारी अधिकृत ज्यू
सिद्धार्थनगर नगर पालिका
नगर कार्यपालिकाको कार्यालय
रुपन्देही २ नं. प्रदेश,

प्रस्तुत विषय सम्बन्धमा यस सि.न.पा.वडा नं ३ स्थित वडका विभिन्न पक्षमा सडकतथा नाला निर्माण सडक पिच फुटपाथ सम्बन्धी विभिन्न तोल पथका भेला गराई प्रतिवद्धता सम्बेतको निर्णय र छलफलको [illegible] कैफ्ब गरी सोको एक प्रति निर्णय कृता यहि पत्र साथ संलग्न राखी पेश गरेको जानकारीको लागी अनुरोध छ।

धुलेश्वर गुरुङ
वडा नं. ३
सिद्धार्थनगर नगरपालिका

सिद्धार्थनगर नगर कार्यपालिका कार्यालय
सिद्धार्थनगर
दर्ता नं.-२६८२३
मिति-०६४।१।२५

आज मिती २०७४।७।२२ गतेका दिन सिद्धार्थनगर नगरपा
पालिकाका वडा नं. ३ वडा सचिव धनेश्वर चन्द्र गुरुङ्को सं
जकत्वमा "क्षेत्रिय शहरी विकास आयोजना अन्तर्गत बस वडाक
विभिन्न सडक पिच नाला विद्युतबत्ति फुटपाथ र अन्य का
~~अर्थ~~ गर्दा वातावरणीय पर्यावरणका के कस्तो प्रभाव पार्ने स
सम्बन्धमा तपसिलमा उपस्थित भई देहायबमोजिमको उपस्थि
मा तपसिल बमोजिमको निर्णय गरियो ।

उपस्थिती ।

१ धनेश्वर चन्द्र गुरुङ्ग सि. न.पा. ३ वडा सचिव
२ मञ्जु पाण्डे ज्यू वडा नागरिक मञ्च संयोजक
३ थानेश्वर पौडेलज्यू वडा नागरिक मञ्च उप-संयोजक
४ अनुराधा गुप्ता - नागरिक सचेतना केन्द्र संयोजक
५ देवराज शर्मा - व. न. मञ्च सदस्य
६ कलामुद्दीन मुसलमान- ने. क. पा. प्राओवादी केन्द्र कलामु
७ विनय झवाली नेपाली कांग्रेस
८ गोपाल भण्डारी रा. प्र. पा.
९ रुपा पुन -अध्यक्ष दर खस्रवा महिला आमा समुह
१० राम-चन्द्र चौधरी - सदस्य व. न. मञ्च
११ सुवेस थापा- Suvesh Thapa,
१२ जनन बहादुर कुंवर - सदस्य सरसफाई

१३ लिला खड्का वडा नागरिक मञ्च सदस्य
१४ ओम प्रसाद पुन · वडा पार्षद ..
१५ मोहन सिंह भाले ना. वडा मञ्च सदस्य
१६ लक्ष्मी गुप्ता — सामाजीक परिचालिका

प्रस्ताव :

१. सडक नाला पिच विद्युतीबत्ति फुटपाथ निर्माण गर्दा वातावरणत पर्यावरण सम्बन्धमा
२ अनुगमन समिती गठन गर्ने सम्बन्धमा ।

प्रस्ताव नं. १ मार्फी हुलफुल गर्दा क्षेत्रिय शहरी विकास आयोजना अन्तर्गत बस वडाका विभिन्न स्थानहरुमा सडक पिच नाला विद्युतिवत्ति फुटपाथ निर्माण गर्दा वातावरण तथा पर्यावरणको ख्याल गर्दै न.पा.को अवधारणा दुई ३ वटै पर्ने धर भएको स्थितीमा भए नभएको स्थितीमा खाली मैदानमा नाला फुटपाथको साईडमा वृक्षारोपन गर्ने गराउने गरी निर्णय गरियो । साथै निर्माणकार्य शुरु भएदेखि निरन्तर काम गर्दा हदैसम्मको हिले निर्माण सामग्रीहरु अनुरोध गर्ने निर्णय गरिएको ।

२. प्रस्ताव नं. २ मार्फी हुलफुल गर्दा क्षेत्रिय शहरी वि आयोजना अन्तर्गत निर्माण भएको नाला, पिच, विद्युत फुटपाथ नियमन तथा अनुगमन गर्नको लागी अनुगमन समि गठन गर्ने निर्णय गरियो ।

थानेश्वर पौडेल संयोजक
मञ्जु पाण्डे — सदस्य
गोपाल भण्डारी — "
लिला खड्का — "
देवराज शर्मा — "

सिद्धार्थनगर नगरपालिका कार्यालय

.....५ नं. वडा नगरपालिका कार्यालय

फोन नं.:०७७-५२४५६०
फ्याक्स नं.:०७७-५२०१६५

सिद्धार्थनगर नगरपालिका वडा कार्यालय उपप्रदेश नं. ५ प्रदेश नेपाल

पत्र संख्या
चलानी नं. १६०

मिति २०६४।१।२५

विषय:- निर्णय उतार पठाइपठाे ।

श्री प्रमुख कार्यकारी अधिकृत ज्यू
सिद्धार्थनगर

सिद्धार्थनगर नगरपालिका कार्यालय
दर्ता नं. २६६६
मिति ०६४।१।२५

उपरोक्त सम्बन्धमा तपसिल उल्लिखित ग्रहणी विकास अर्थोजना कार्य -चक्र १६६ मिती २०६४।१।१४ गतेका पत्र अनुसार आज मिती २०६४।१।२५ गते का दिन दुलकभरी निर्णय उतार पर्ने पत्र साथ पठाइएको व्यहोरा अनुरोध गर्दछु ।

२०६४।१।२५
शिव नारायण गुप्ता
वडा सचिव - ५

आज मिति २०६४।०१।२५ गते सोमबारका दिन सि.न.पा. वडा नं. ५ मा श्रेणीय सहरी विकास आयोजना अन्तर्गत हुन लागेको विकास निर्माण कार्यले पारेको वातावरणीय प्रभाव सम्बन्धी छलफल गर्ने वडाका वडा सचिव श्री शिव नारायण गुप्ता प्यूको हाजिरीमा यहाँ वडाका गृह - अलादर्शी, विभिन्न राजनैतिक दलका प्रतिनिधिको उपस्थितिमा छलफल गरी निर्णय गरियो

श्री शिव नारायण गुप्ता (वडा सचिव)
श्री प्रेम नारायण गुप्ता
श्री सुलोचन सुनार
श्री जगदिश प्रसाद गुप्ता
श्री भुन्नु प्रसाद पाण्डे
श्री रति रमण लेखी (नगरपालिका)
श्री अनुसन्धी अधिकारी
श्री [illegible] लोकपा समाज
श्री ओमकार गाछेल
श्री पुरन जैस्वाल
श्री माया देवी
श्री [illegible]
श्री नारायण प्रसाद अग्रवाल
रारवी केशरी श्री रारवी केशरी

श्री सुनिल यादव

अध्यक्ष: पुन प्रसाद भेट्ट

श्री कमल मल्लिक

श्री उमा पाण्डेय

प्रस्तावः-

निर्णयः-

प्रस्ताव नं ९ उपर छलफल गर्दा सुझाव अनुसार यस प्रकार प्रस्ताव छ।

१) कन्ट्रक्सन कार्य गर्दा पानी रोकेर प्रदुषण नगराईकार्य गर्ने।

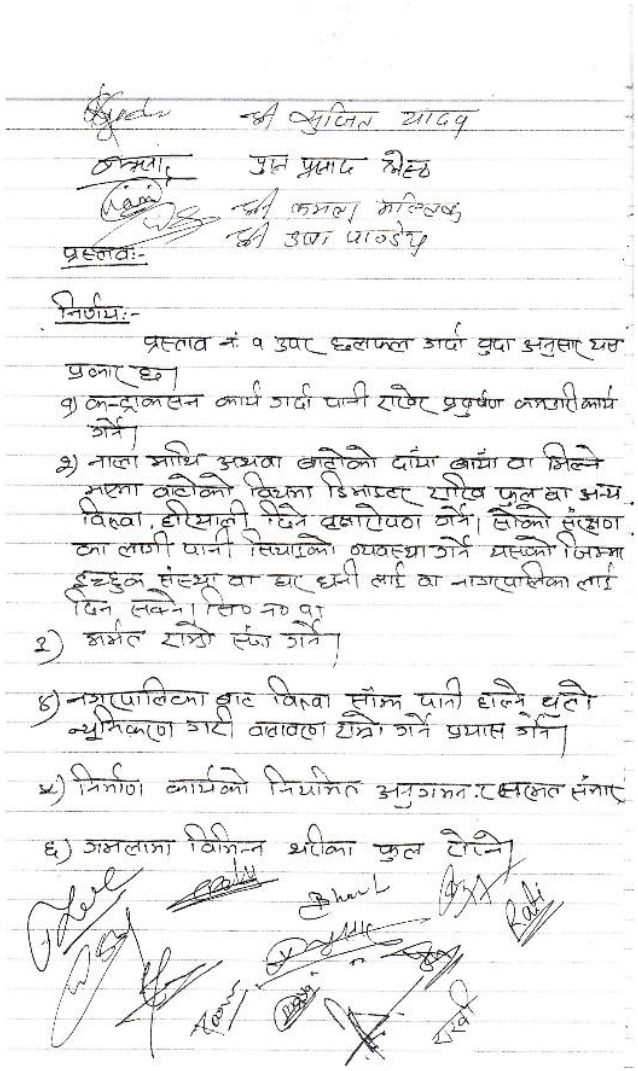
२) नाला भरि अथवा जहाँको दाँया आँया वा भित्ते मरेमा वहाँको विधवा डिभाइट् रोकि फुल वा अन्य विधवा दीयालो पैसे दक्षाउने गर्ने। सोको संरक्षण का लागी पानी सिंचाईको व्यवस्था गर्ने यस्को जिम्मा इच्छुक संस्था वा घर धनी लाई वा नगरपालिका लाई दिन सकने। सि० नं० ९।

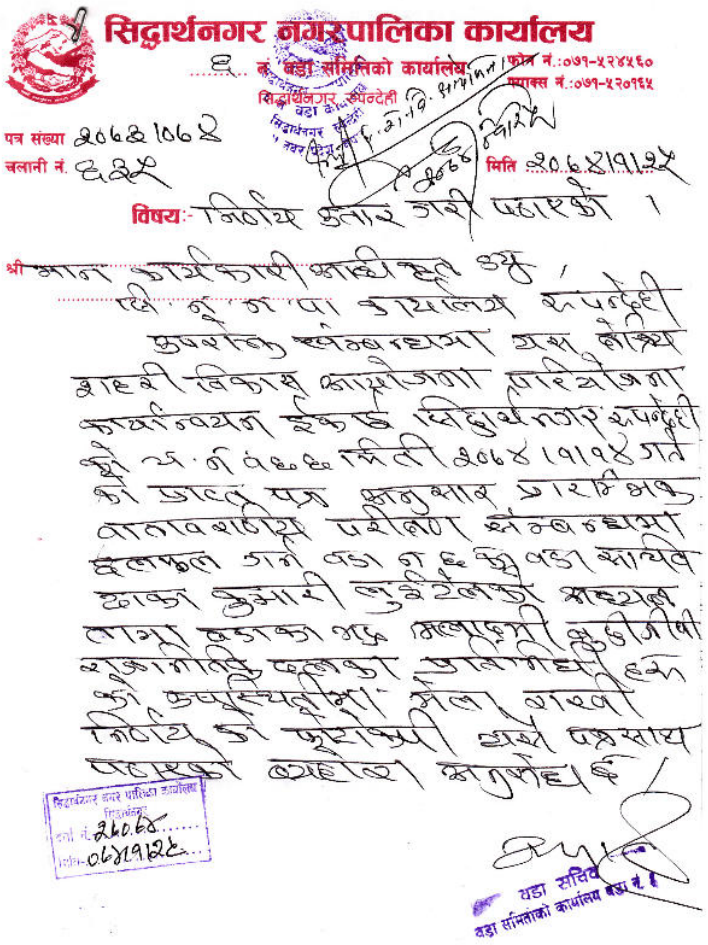
३) आमेत राख्ने संज गर्ने।

४) नगरपालिका घाट विधवा सौन्दा पानी हालने हुँदा ध्यानिकरण गरी व्यवस्था गर्ने प्रयास गर्ने।

५) निर्माण कार्यको नियमित अनुगमन गरिनेछ।

६) गमलाका विभिन्न थरीका फुल रोपने।





सिद्धार्थनगर नगरपालिका कार्यालय

८ नं. वडा सभासदको कार्यालय

सिद्धार्थनगर, रुपन्देही

फोन नं.:०७१-५२४५६०

फ्याक्स नं.:०७१-५२०१६५

पत्र संख्या २०६८।१०६२

चलानी नं. ८४९

मिति २०६८।१।१२५

विषयः- निर्णय प्रमाण गरी पठाईएको ।

श्री माननीय कार्यकारी अधिकृत ज्यू,

रुपन्देही नगरपालिका अन्तर्गत रहेको वडा नं. ८ को वडा कार्यालय रुपन्देही मुसहरवा स्वच्छ्यता गर्ने, सौचालय बाहेरी विकास कार्यक्रम तथा योजना कार्यान्वयन गर्नका लागि सिद्धार्थनगर नगरपालिका को ज.नं. ७०६८ मिति २०६८।१।१२५ गते को पत्रले पत्र अनुसार ७ वटै भक्त वातावरणीय परीक्षण सम्बन्धमा छलफल गर्न वडा नं ८ को वडा सदस्य छाक कुमारी कुँवरलाई सहयोग गर्न वडा नं ८ का सबै मल्लिकलाई खुलाउनुहुने कुराको प्रतिनिधित्व हुने उपस्थितीमा सेला गरियो निर्णय को फरकमा अर्को पक्षसाय पठाईको व्यहोरा अनुरोध छ ।

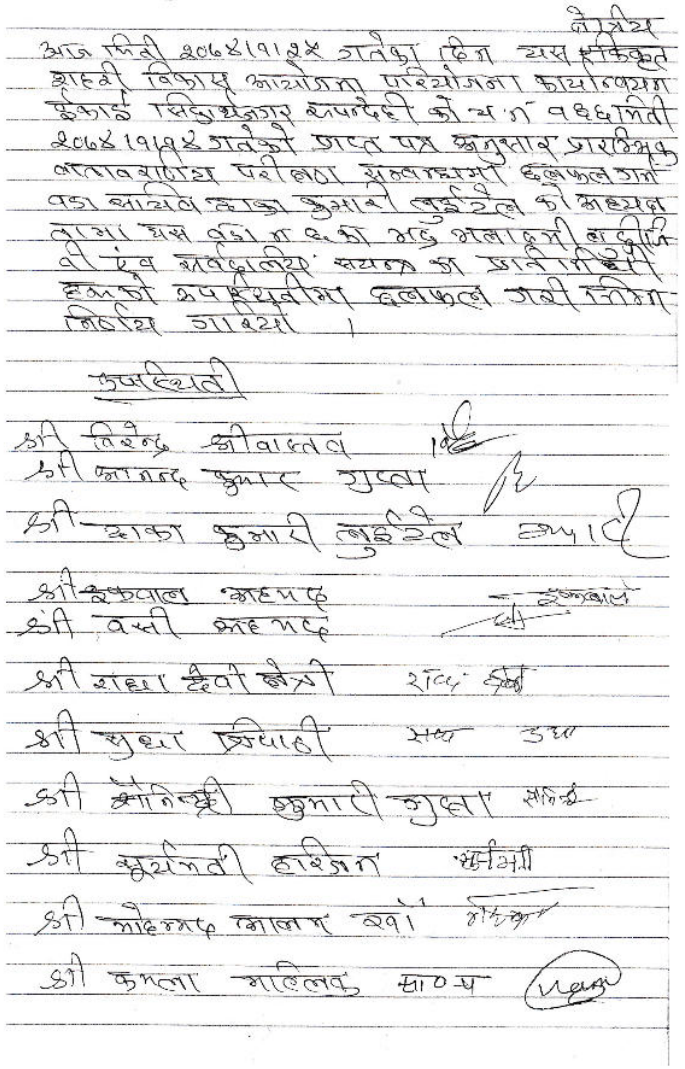
सिद्धार्थनगर नगर पालिका कार्यालय

दर्ता नं. २८०६८

मिति-०६।१।१२५

वडा सदस्य

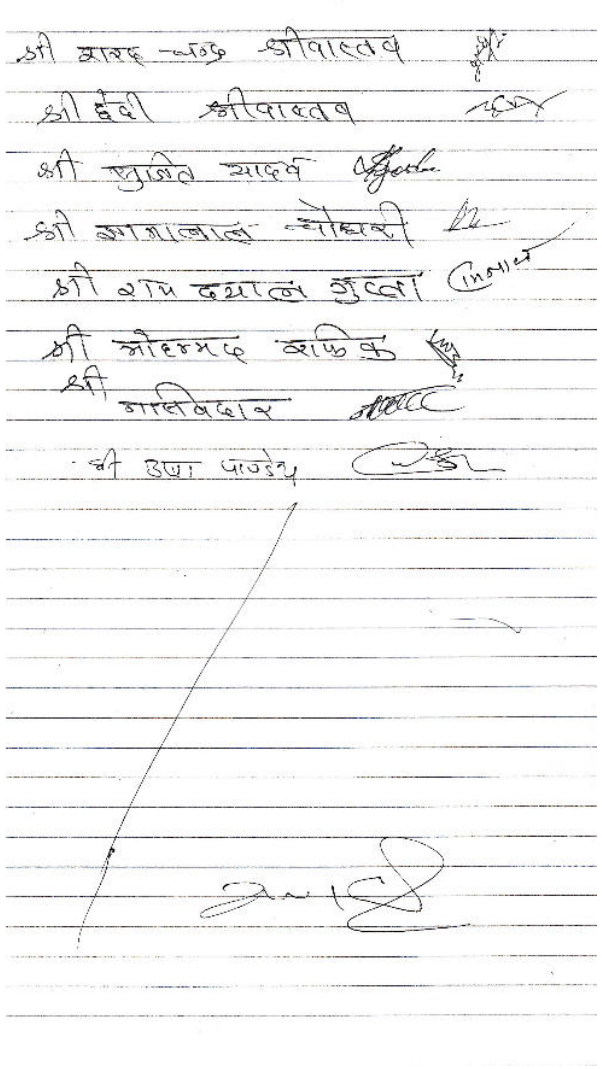
वडा सभासदको कार्यालय वडा नं. ८



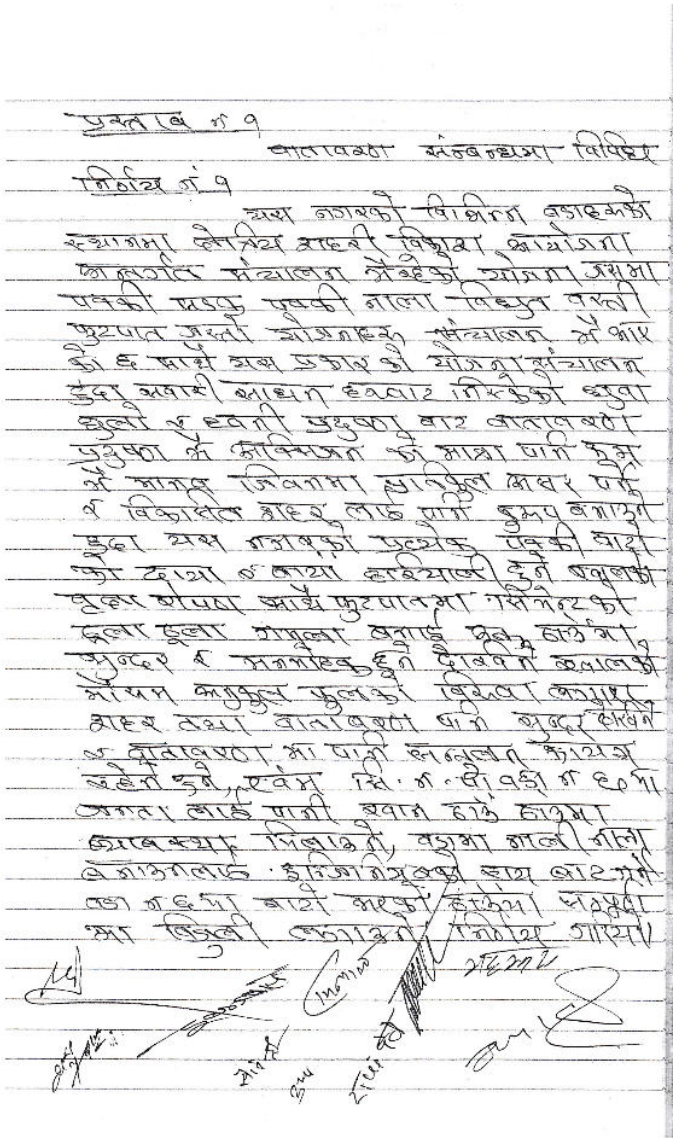
अतः मिती २०६४।१।१४ गतेको दिन यस मन्त्रिपरिषद्
शाखाको विभाग आयोजना परियोजना कार्यालयमा
हुनुपर्ने विभागीय सचिवहरुको बैठक वस्तुस्थिति
२०६४।१।१४ गतेको प्राप्त पत्र अनुसार प्रारम्भिक
वातावरणीय परीक्षण प्रतिवेदन सम्बन्धमा छलफल गर्न
बोलाउने बारेको सूचना अनुसार उपस्थित भएका
माननीय सदस्यहरु तथा अन्य सबै व्यक्तिहरुलाई
हार्दिक स्वागत गर्दछु भनी छलफल गर्न निम्न
विषय प्रवेश गराएँ ।

उपस्थिति

श्री दिनेश श्रीवास्तव
श्री आनन्द कुमार गुप्ता
श्री राका कुमारी तुईटेल
श्री इकबाल अहमद
श्री वसी अहमद
श्री शङ्खा देवी श्रेष्ठ
श्री सुधा त्रिपाठी
श्री मनेन्द्री कुमारी गुप्ता
श्री सुरेन्द्र हरिजन
श्री मोहम्मद कलाम खाँ
श्री कमला मल्लिक साह



श्री आनन्द कुमार श्रीवास्तव
श्री दिनेश श्रीवास्तव
श्री सुजित साहनी
श्री जगतलाल चौधरी
श्री राम कृपाल गुप्ता
श्री मोहम्मद शफिक
श्री गणेश्वर साह
श्री उषा पाण्डेय



सिद्धार्थनगर नगरपालिका
८ नं. वडा कार्यालय
सिद्धार्थनगर, रुपन्देही
५ नंबर प्रदेश, नेपाल

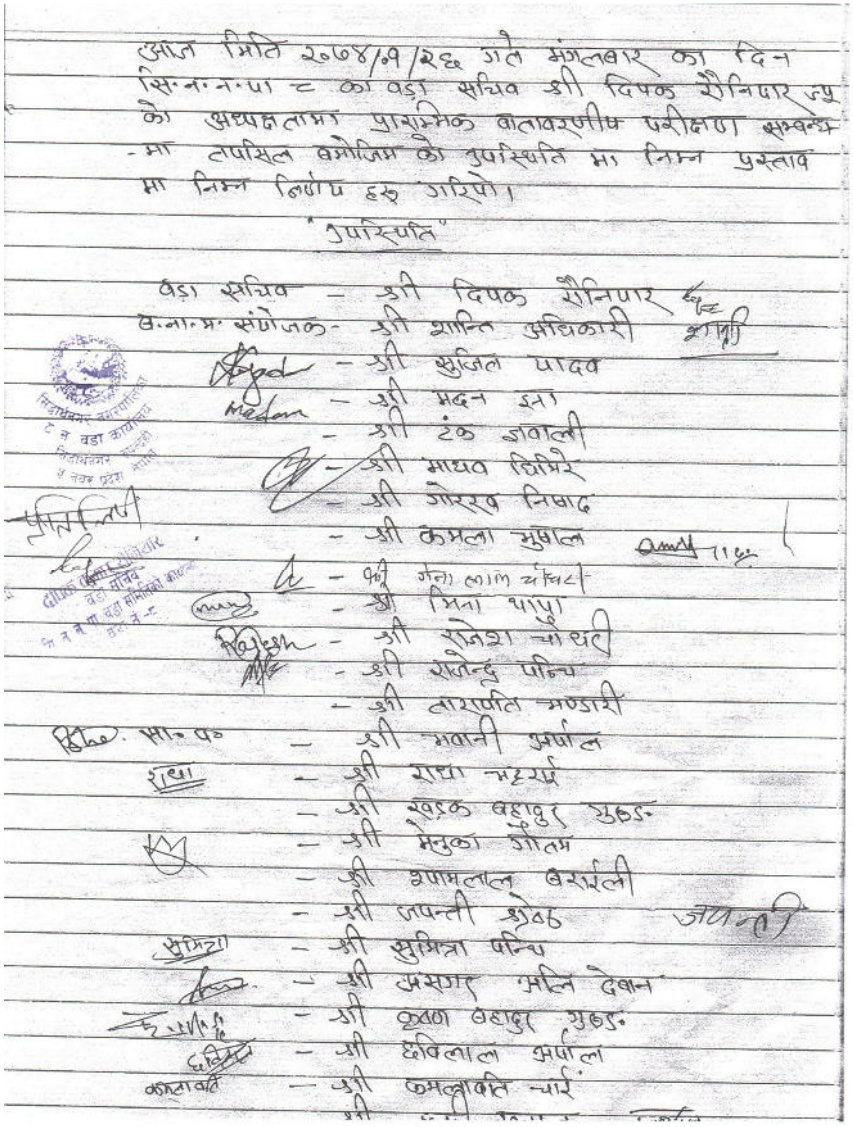
पत्र संख्या: ०७३।७४
चलानी नं. ८४६

मिति :२०७४/०१/२६

विषय : निर्णय पठाएको सम्बन्धमा ।

श्रीमान : कार्यकारी अधिकृत ज्यु ।
सि.न.न.पा.कार्यालय

उपरोक्त सम्बन्धमा सि.न.न.पा.को च.न.१६६ को पत्रानुसार यस सि.न.न.पा.वडा न.८ मा सडक पिच, नाला, विद्युत, फुटपाथ निर्माण कार्य को वातावरण सम्बन्धी निर्णय यसै साथ संलग्न राखि पठाएको व्यहोरा अनुरोध छ ।



आज मिति २०७४/१/२६ गते मंगलवार का दिन सि.न.न.पा. ८ का वडा सचिव श्री दिपक रौनियार ज्यू को अध्यक्षतामा प्रारम्भिक वातावरणीय परीक्षण सम्बन्धमा तपसिल बमोजिम को उपस्थिति मा निम्न प्रस्ताव मा निम्न निर्णय हरु गरिएको।

"उपस्थिति"

वडा सचिव – श्री दिपक रौनियार
उ.ना.प्र. संयोजक – श्री शान्ति अधिकारी
– श्री सुजित यादव
– श्री मदन डंगा
– श्री टंक जावाली
– श्री माधव घिमिरे
– श्री गोरख निषाद
– श्री कमला मुखिया
– श्री गंगा लाल अधिकारी
– श्री मिना पाण्डा
– श्री राजेश चौधरी
– श्री रतेन्द्र पन्थि
– श्री तारादेवी भण्डारी
– श्री भवानी पर्याल
– श्री राधा भट्टराई
– श्री बहादुर गुरुङ
– श्री मनुका गौतम
– श्री श्यामलाल बरालेली
– श्री जयन्ती शेठ
– श्री सुमित्रा पन्थि
– श्री प्रसाद 'मलि देवान'
– श्री कृष्ण बहादुर गुरुङ
– श्री कविलाल पर्याल
– श्री कमलावति चार्ई

– श्री विनोद राज पाण्डे
– श्री दिवशा भण्डारी
– श्री तारा अधिकारी
– श्री सरस्वति जवाली
– श्री देवि मल्ल शहतराज
– श्री भगवति रावल
– श्री धनबहादुर भण्डारी
– श्री गंगा घिमिरे
– श्री इन्दिरा के.सी.
– श्री राम प्रसाद काफ्ले
– श्री विमला ढकाल

प्रस्तावहरु :-

१) वातावरण सम्बन्धमा ।
२) विविध ।

निर्णयहरु :-

प्रस्ताव नं. १ मा यि हुलफुल गर्दा सिद्धार्थनगर नगरपालिका मा संचालन हुने क्षेत्रीय शहरी विकास आयोजना अन्तर्गतको "Construction of Siddharna -gar Drainage, Roads, foot Path Road furni -ture" (RUDP/ICB/SN/4)" वाट निर्माण अवधिमा धुवा, धुलो र ध्वनि प्रदुषण हुने हुँदा, निर्माण कार्य गर्दा वाटोमा पानी छर्केर, धुलो प्रदुषण हुन नदिने निर्माण गर्दा वाटोमा पानी छर्कने । धुवा प्रदुषण को लागि धुवा कम निस्कने उपकरणहरु प्रयोग गर्नुपर्ने सम्भव भएका स्थानहरुमा वाटोको दुवै तर्फ वृक्षारोपण गर्नु पर्ने सम्भव भएका स्थानहरुमा घर आगाडी को नालीमा फलामे जाली को पनि व्यवस्था गर्नु पर्ने यस नगरको प्रमुख पक्की वाटो को दुवै तर्फ हरियाली हुने खालको वोट विरुवा हरुको वृक्षा रोपण को साथै गमला को रुख पनि राख्ने कुरा को हुने

पर्ने र बिरुवा हरु पनि सुन्दर र मनमोहक हुने
देखिने खालका मापदण्डानुकूल (उपयुक्त) हुनु पर्ने । निर्माण स
लाई आवागमन अवरुद्ध हुन गरी खनन नहुने र
निर्माण कार्य गर्दा सम्भव भए सम्म कम खनि
निकाली कार्य निर्माण गर्नुपर्ने र कसैले रुख
काट्नु पर्ने भएमा एउटा रुख बराबर २५ वटा
रुख लगाउनु पर्ने व्यवस्था गरिएको छ ।
बाटोमा आवत जावत गर्ने बटुवा का लागि डस्टबिन
को पनि व्यवस्था गर्नु पर्ने भन्दै रुखहरु लाई सक
बचाएर नगर हरियाली होस भन्दै ढलको सहज
निकास हुने गरि कार्य को छिटो निर्माण होस भन्ने
सुझाव दिन चाहन्छौं ।

विविध मा छलफल गर्दा अन्य विषय नभएकोले
आजको बैठक यहिं समापन गर्ने सर्वसहमति बाट जा-
-री गरिन्छ ।

[illegible signatures]

प्रतिलिपि

[illegible] वडा सचिव

सिद्धार्थनगर नगरपालिका कार्यालय

..१०.. नं. वडा समितिको कार्यालय

सिद्धार्थनगर, रुपन्देही

फोन नं.:०७१-५२४५६०
फ्याक्स नं.:०७१-५२०१६५

पत्र संख्या ०६७/०६८
चलानी नं. २४५

मिति २०६८/१/२४

विषय: जानकारी सम्बन्धमा ।

श्री [illegible]
[illegible] कार्यालय
सिद्धार्थनगर, रुपन्देही
प्रदेश नेपाल

सिद्धार्थनगर नगरपालिका कार्यालय
सिद्धार्थनगर
दर्ता नं. २६८४२
मिति ०६८/१/२४

[illegible]

[illegible signature]

भोला प्रसाद बराई
(वडा सचिव)
वडा नं.-१०
सिद्धार्थनगर नगरपालिका

आज मिति २०७८।८।२२ गतेका दिन यस हिमतश्रृंखला वडा समिति कार्यालयमा गई बुझाउने पत्रका सम्बन्धमा ओला प्रसाद पराई एमसी को संयोजकत्वमा ढोलिय शहरि विकास आयोजना (RUSP) प्रारम्भिक वातावरणीय परिक्षण (IEE) सम्बन्धमा यस वडाका राजनितिक दल तथा सामाजिक संस्थाको उपस्थितिमा विभिन्न विषयमा छलफल गरियो ।-

उपस्थिति	हस्ताक्षर
१. श्री ओला प्रसाद पराई - वडा समिति	
२. " [illegible] (Accident)	
३. " विना माया श्रेष्ठानी - वि.नि.सं संयोजक	विना
४. " कुल्ल बहादुर कुवर	
५. " मुलाक अहमद	
६. " कपिलदेव तिमि	
७. " देवी माया रामाल्सी	देवी
८. " राजेन्द्र कार्की	
९. " महेश चौधरी	महेश
१०. " लक्ष्मी माया रामाल्सी	लक्ष्मी
११. " पदम थापा	
१२. " संगिता सुनुवार	
१३ " शिक्षा कार्की	

१४ श्री राम देव काईती रामले २।
१५. " लाइकी पाँडेला लिम्बु।

प्रस्तावहरु :-

(१) वातावरण सम्बन्धमा ।-

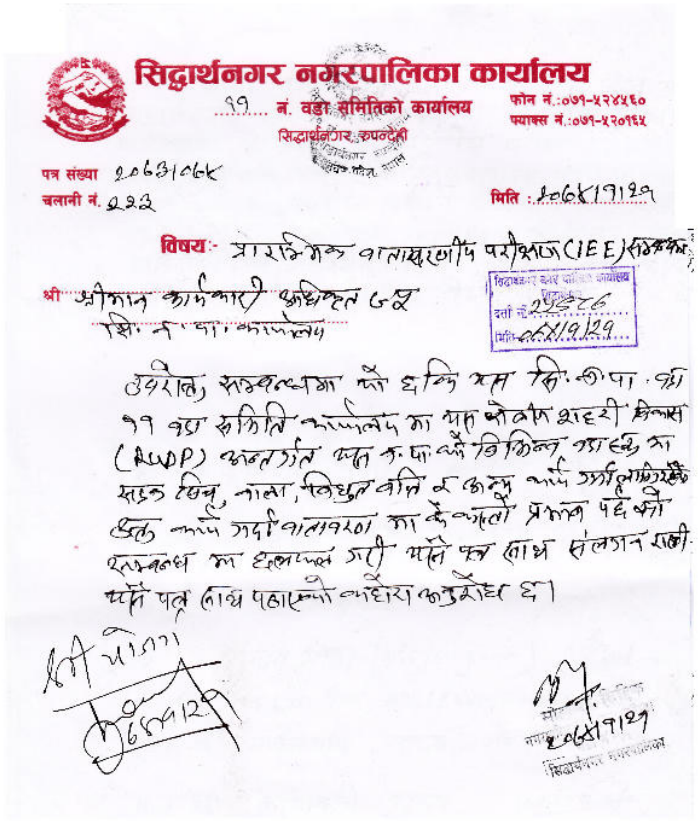
निर्णय नं. १

प्रस्ताव नं. १ मात्री छलफल गर्दा "ढोलिय शहरि विकास आयोजना" अन्तर्गत यस हिमा को विभिन्न वडाहरुमा सडकपिच, नाला, विद्युत बत्ती, फुटपाथ र अन्य कार्य भैरहेको र हुने हुँदा तपसिल बमोजिम समस्या हुने -

१) धुलो धुवाँ बाट स्वास्थ्यमा असर्मा ।-
२) निर्माण सामाग्री अव्यवस्थित राख्दा दुर्घटना हुने सम्भावना ।-
३) ध्वनी प्रदुशण हुने,
४) निर्माण कार्य सम्पन्न नहुदा धुल, धुवाँ, हिलो गर्दा बातावरणमा असर्मा ।-

सम्भावित तपसिल बमोजिम

(१) सडक को दुवै साइडमा बाँस बिरुवा लगाउने ।-
(२) अव्यवस्थित निर्माण सामाग्री सडकमा नराख्ने ।-
(३) निर्माण कार्य जारी रहदा धुलो अवरोधक गर्ने पानी छर्ने व्यवस्था मिलाउने ।-
(४) कार्यमा अनुकुलता र फलफल र वातावरणमा सन्तुलन कायम गर्न अन्य तर्फ सुझाव बाट कियेक गरियो ।-



सिद्धार्थनगर नगरपालिका कार्यालय

९१ नं. वडा समितिको कार्यालय

सिद्धार्थनगर, कपिलवस्तु

फोन नं.:०७७-५२४५६०

फ्याक्स नं.:०७७-५२०१६५

पत्र संख्या २०६३/०६८

चलानी नं. २२३

मिति : २०६८/१/२९

विषय:- प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धमा ।

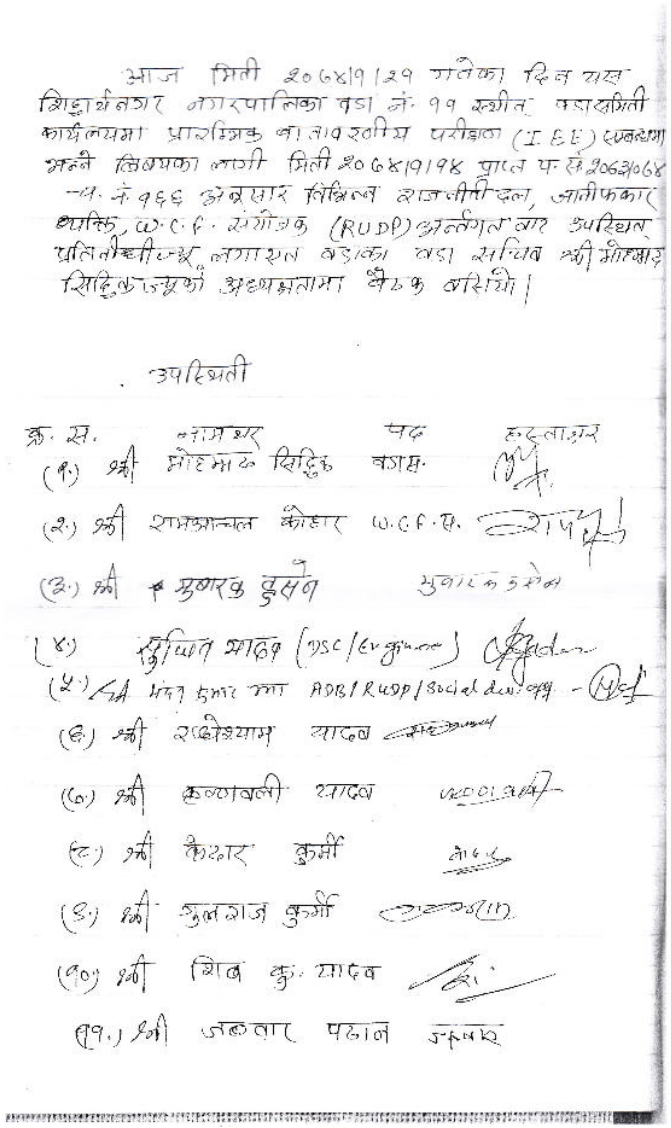
श्री प्रशासन कार्यकारी अधिकृत ज्यू

सि. न. पा. कार्यालय

सिद्धार्थनगर नगर पालिका कार्यालय
दर्ता नं. २५६८२६
मिति २०६८/१/२९

उपरोक्त सम्बन्धमा यस वडा कार्यालय मा यही सोमबार शहरी विकास (RUDP) अन्तर्गत पक्की ढल निर्माण, नाला, विद्युत बत्ति र कालु आदि उपभोक्ताहरुको लागि आवश्यकता को बारेमा छलफल गरी यसै पत्र साथ संलग्न राखी यहाँ पत्र साथ पठाएको व्यहोरा अनुरोध छ ।

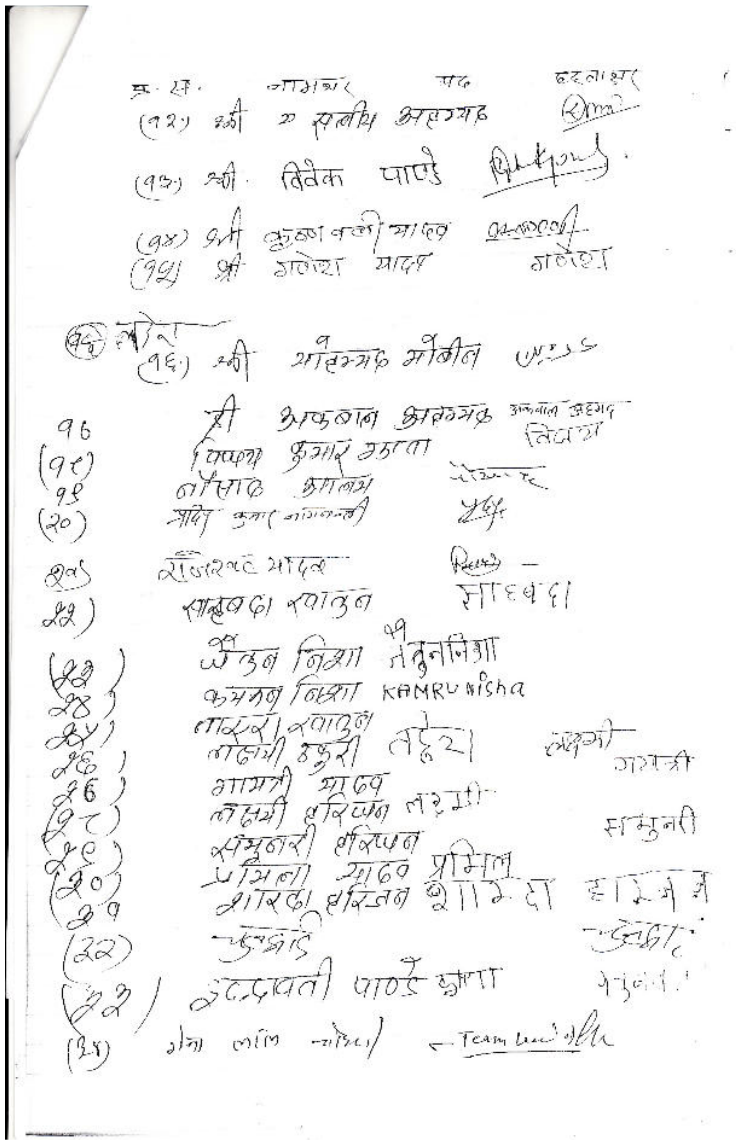
२०६८/१/२९



आज मिति २०६८/१/२९ गतेका दिन वडा सिद्धार्थनगर नगरपालिका वडा नं. ९१ स्थीत वडासमिती कार्यालयमा प्रारम्भिक वातावरणीय परीक्षण (I.E.E) सम्बन्धमा भएने छलफलका लागी मिती २०६८/१/२४ पत्राचे प.नं.२०६३/०६८ च.नं. ९६९ अनुसार विभिन्न राजनीतीदल, जातीफकार व्यक्ति, W.C.F. संगठक (RUDP) अन्तर्गत आए उपस्थित प्रतिनीधीहरु नगरपालिका वडाका वडा सचिव श्री मोहम्मद सिद्दिकज्यूको अध्यक्षतामा बैठक बसियो ।

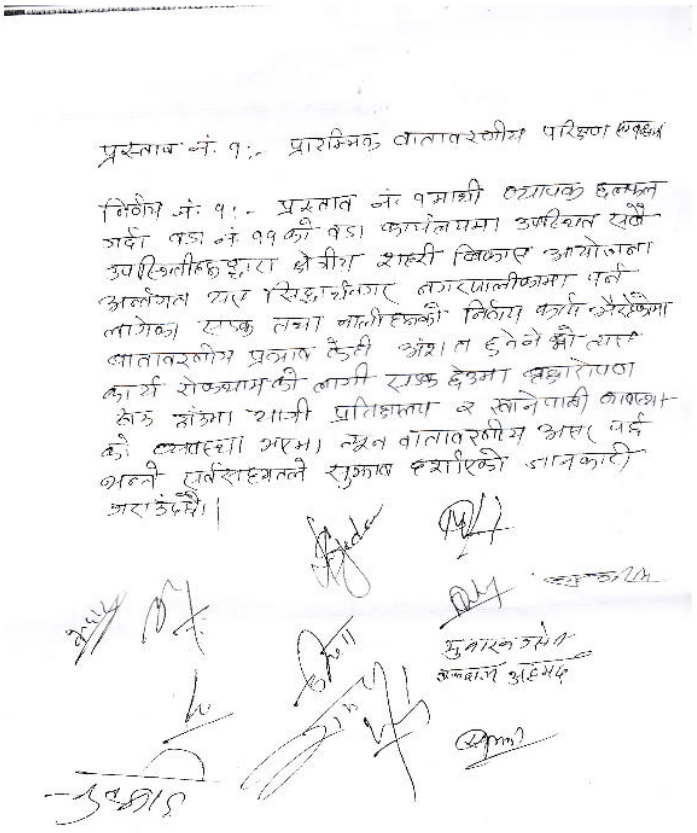
उपस्थिती

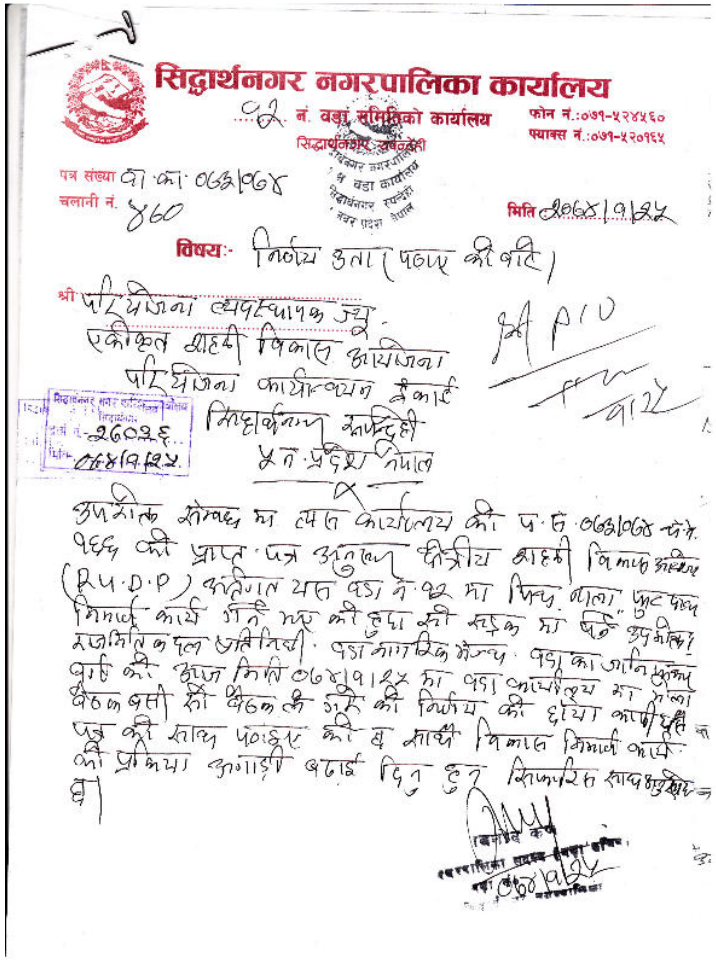
क्र. स.	नाम थर	पद	हस्ताक्षर
(१.)	श्री मोहम्मद सिद्दिक	वडाध्य.	
(२.)	श्री रामकल्पल कोहार	W.C.F.स.	
(३.)	श्री मुनारुक हुसेन	सुझाव दिने	
(४.)	उपस्थित श्रोता (PSC/Engineer)		
(५.)	श्री मंगल कुमार क्षत्र	ADB/RUDP/Social Development	
(६.)	श्री राधेश्याम यादव		
(७.)	श्री कल्पावती यादव		
(८.)	श्री केदार कुर्मी		
(९.)	श्री गुलराज कुर्मी		
(१०.)	श्री शिव कु. यादव		
(११.)	श्री जलवार पठान		



प्रस्ताव नं. १:- प्रारम्भिक वातावरणीय परिक्षण सम्बन्धमा

निर्णय नं: १:- प्रस्ताव नं १मा छलफल गर्दा यस नं १९ को पेज नं ९८ कार्यालयमा उपस्थितीहरुद्वारा क्षेत्रीय शहरी विकास आयोजना अर्न्तगत पर्ने सिद्धार्थनगर नगरपालीकामा पर्ने लागेका रुपक तथा थालीहरुको निर्णय कार्य अगाडीका वातावरणीय प्रकाश कैली आँश। त हुनेले श्री तारी कार्य रोक्कामको लागी रुपक हेर्दमा बेझारोपण को व्यवस्थी अरुमा। न्यून वातावरणीय असर पर्ने अन्नी पर्नसक्नले सुझाव दर्शाएको जानकारी जरा उँदैं।





सिद्धार्थनगर नगरपालिका कार्यालय

वडा नं. वडा समितिको कार्यालय

फोन नं.:०७१-५२४५६०

फ्याक्स नं.:०७१-५२०१६५

पत्र संख्या दो.का. ०६३/०६४

चलानी नं. ४६०

मिति २०६४/१/१५

विषय:- निर्णय गरी (पठाए को बारे)

श्री परियोजना व्यवस्थापक ज्यू.

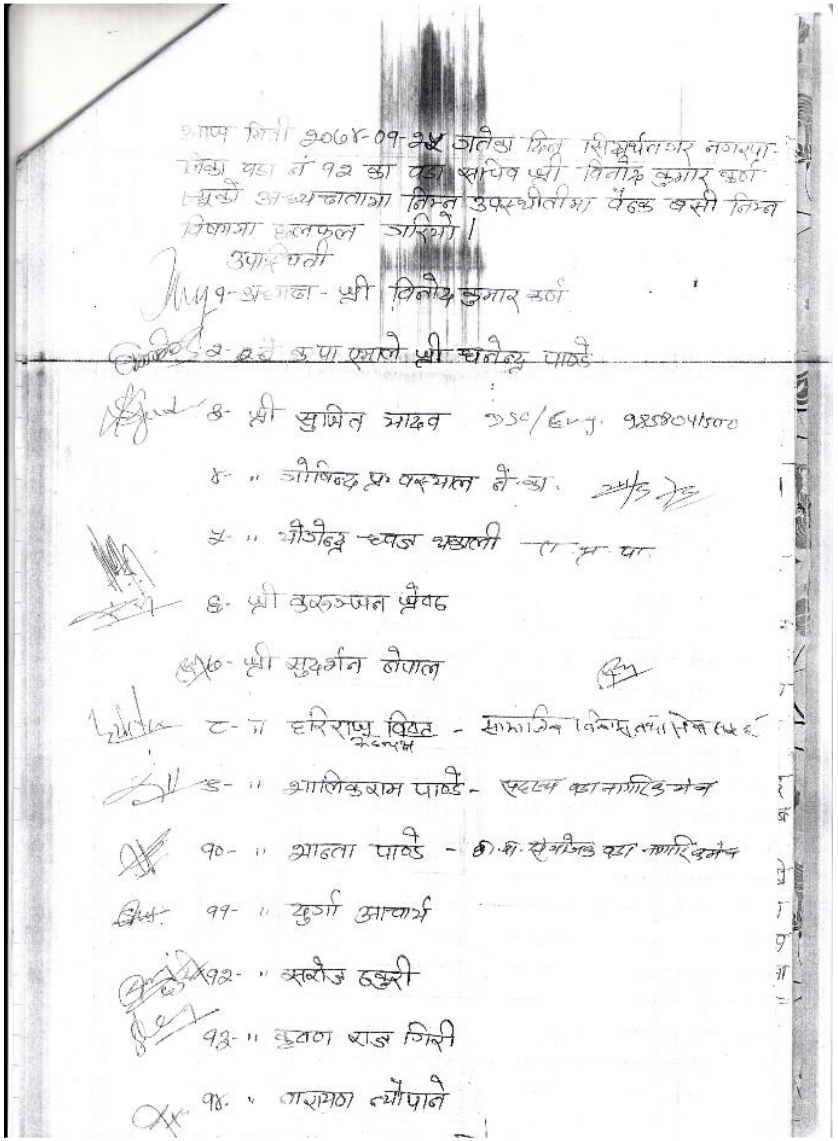
एकीकृत शहरी विकास आयोजना

परियोजना कार्यान्वयन इकाई

सिद्धार्थनगर नगरपालिका

लु.प्र.देश नेपाल

उपरोक्त सम्बन्ध मा यस कार्यालय को प.सं. ०६३/०६४ को १६६ को प्राप्त पत्र अनुसार शहरी सडक विकास आयोजना (R.U.D.P) बाट यस वडा नं. १२ मा स्थित बाला फुट पथ निर्माण कार्य गरि सक्न को हुदा को सडक मा पर्ने अनुमानित! सम्पत्ति कर सम्बन्धी वडा कार्यालय वडा को आर्थिक भेजन्य वडा को आर्थिक सुरक्षा को आज मिति ०६४/१/१५ मा वडा कार्यालय मा बोला बैठक बसी को बैठक को मुटे को निर्णय को द्वारा कार्यपूर्ति प्रमाण पत्र को साथ पठाईएर को छ साथी निर्माण कार्य को प्रक्रिया अगाडी बढाई दिनु हुन सिफारिस साथ अनुरोध छ।



आज मिति २०६४-०१-२५ गतेका दिन सिद्धार्थनगर नगरपालिका वडा नं १२ का वडा सचिव श्री विनोद कुमार वर्मा ज्यूको अध्यक्षतामा निम्न उपस्थितीमा बैठक बसी निम्न विषयमा छलफल गरियो।

उपस्थिती

१- अध्यक्ष- श्री विनोद कुमार वर्मा

२- वडा सदस्य श्री घनेन्द्र पाण्डे

३- श्री सुमित माधव

४- " गोविन्द प्र. पश्चात

५- " गौरीदत्त यादव

६- श्री बुरुज्जान शैयद

७- श्री सुवर्णन नेपाल

८- " हरिराम विश्वत - सामाजिक परिचालन

९- " आलिकराम पाण्डे - स्टाफ कानगिडमेन्ट

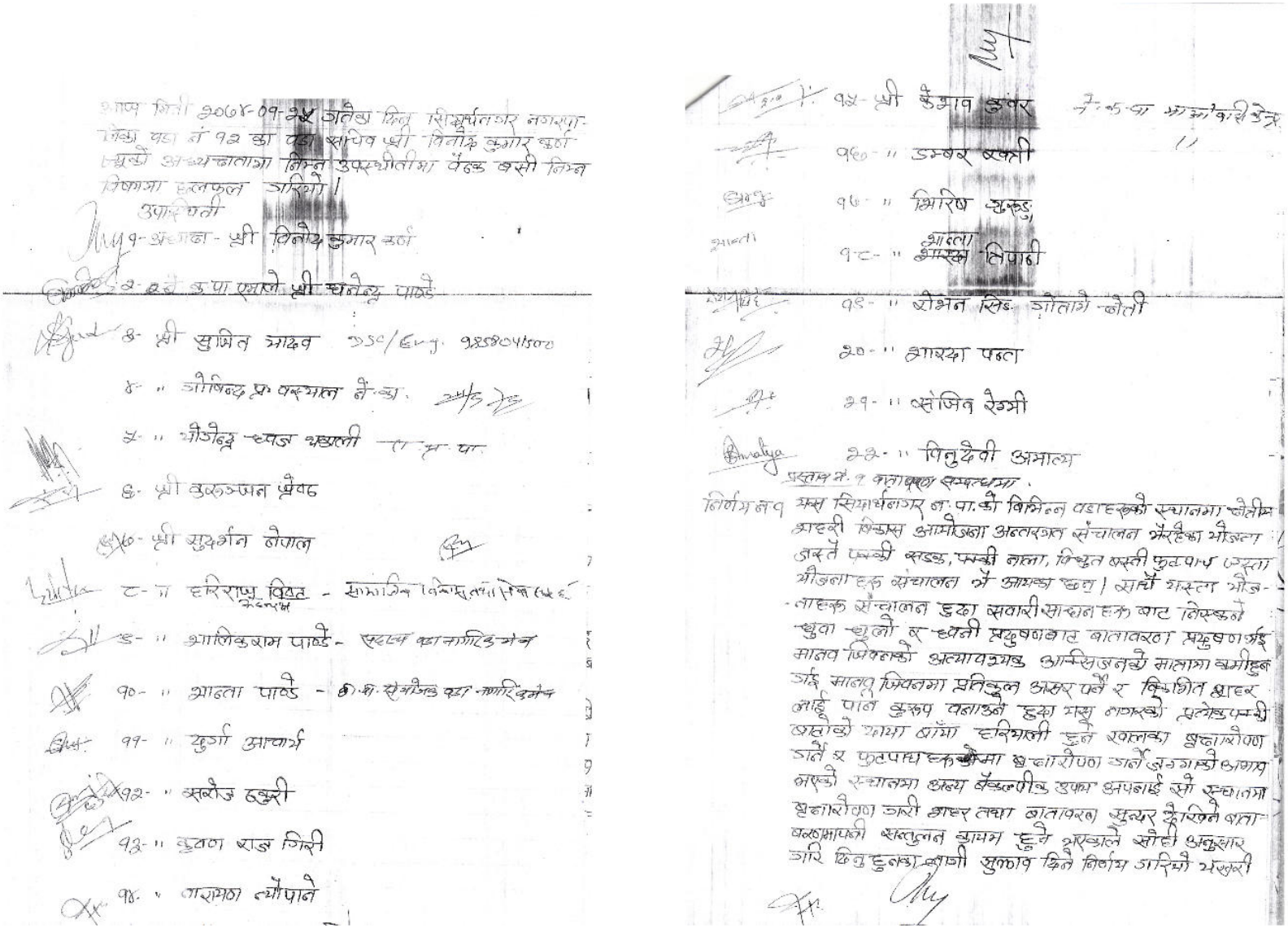
१०- " आशता पाण्डे - [illegible]

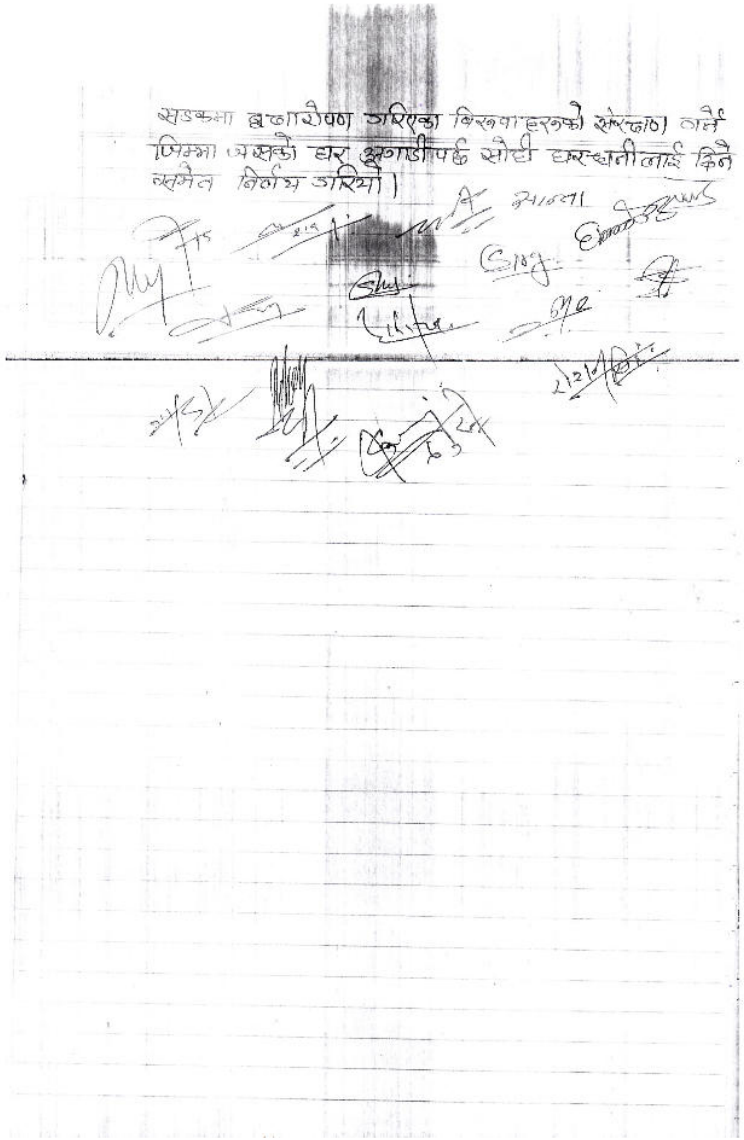
११- " दुर्गा आचार्य

१२- " सरोज चौधरी

१३- " चुडाण राज गिरी

१४- " गायत्री चौपाने





सिद्धार्थनगर नगरपालिका कार्यालय

.....१३ नं. वडा समितिको कार्यालय

पत्र संख्या :- सि.न.पा.०६३।०६४ सिद्धार्थनगर, रुपन्देही

चलानी नं. :- ३८६ मिति २०६४।१।२५

विषय :- निर्णय प्रति पठाइएको ।

श्री .....मान्यवर कार्यकारी अधिकृत ज्यू

.....सिद्धार्थनगर नगरपालिका

(कार्यालय)

उपरोक्त सम्बन्धमा न.पा. कार्यालय को च.नं.१६६ मिति २०६४।१।१४ गते को प्राप्त पत्र अनुसार यस वडा स्थित विकास आयोजना (RUDP) अन्तर्गत यस न.पा. को विभिन्न वडा हुँदै गई सिद्धु नाला विच्छेद गरी फुटपाथ एवम् कार्यमा गर्न गईरहेको वातावरण मा के कस्तो प्रभाव पर्दछ सो सम्बन्ध मा मिति २०६४।१।१२ गते यस वडा समितिको कार्यालय वडा नं.१३ मा छलफल गरी राय सहित पत्र साथ पठाइएको व्यहोरा अनुरोध गरिन्छ ।

२०६४।१।१६

दिपेश प्रसाद गुप्ता

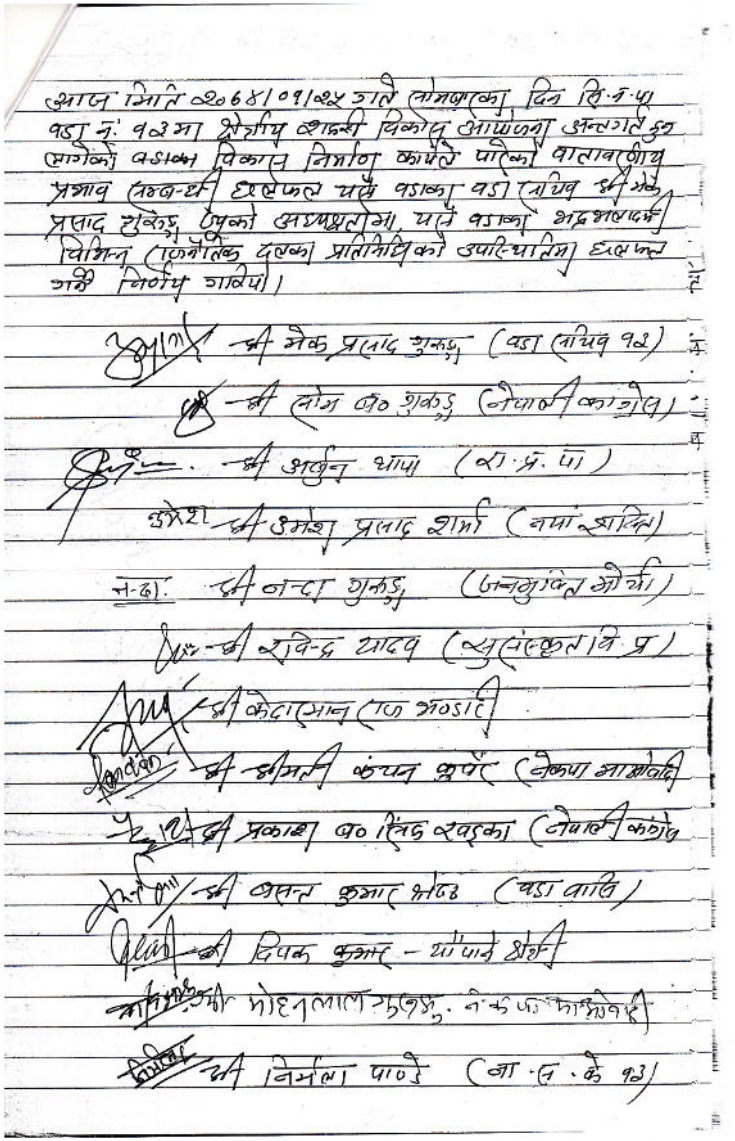
नगरपालिका सदस्य (वडा सचिव)

वडा नं० १३

सिद्धार्थनगर नगरपालिका

दर्ता नं.:-

मिति :- २०६४।१।१६



आज मिति २०६४/०१/२५ गते जनकल्याण दिन हि.व.प. वडा नं. ४३ मा क्षेत्रीय स्तरको विकास आयोजना अन्तर्गत हुन लागेको वडाका विकास निर्माण कार्यले पार्ने वातावरणीय प्रभाव तथा-थप हुनसक्ने यस्ै वडाका वडा सचिव श्री मेक प्रसाद शुक्रेनु भुक्को सझाबसहितमा, यस वडाका अद्यक्षज्यूको विभिन्न टोलका प्रतिनिधिको उपस्थितिमा देहाय बमोजिम निर्णय गरियो।

श्री मेक प्रसाद शुक्रेनु (वडा सचिव ५४)

श्री लोग ब० शुक्रेनु (नेपाली कांग्रेस)

श्री अर्जुन थापा (रा.प्र.पा)

श्री उमेश प्रसाद शर्मा (नया शक्ति)

श्री नन्दा शुक्रेनु (जनमुक्ति मोर्चा)

श्री रविन्द्र यादव (एकीकृत मा.ले)

श्री केदारमान ब० भण्डारी

श्रीमती कंचन कुमारी (नेकपा माओवादी)

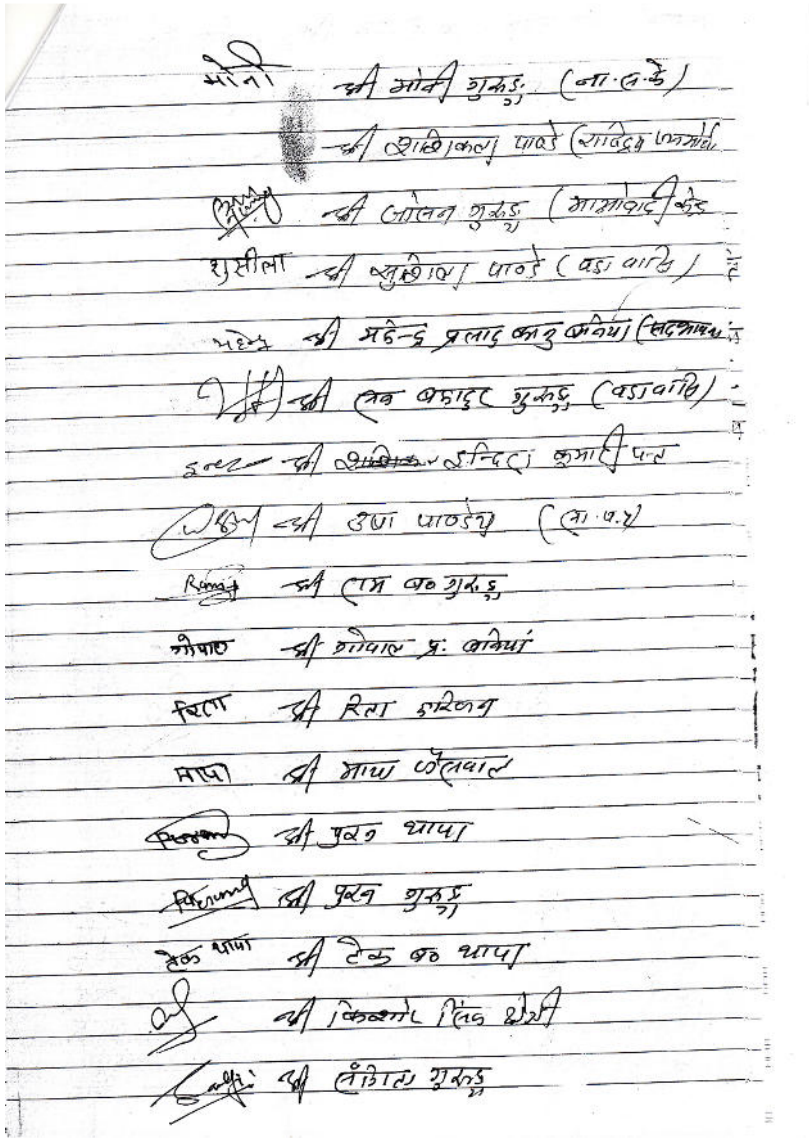
श्री प्रकाश ब० क्षेत्रि रक्सका (नेपाली कांग्रेस)

श्री बसन्त कुमार भण्ड (वडा वासि)

श्री दिपक कुमार - थापा क्षेत्री

श्री मोहनलाल शुक्रेनु. नेकपा माओवादी

श्री निर्मला पाण्डे (जा.ज.के ५४)



मोनी श्री मोनी शुक्रेनु (ना.ज.के)

श्री शशिकला पाण्डे (सामाजवादी फोरम)

श्री जोलन शुक्रेनु (मालपोट्टी केन्द्र)

शुसीला श्री सुशीला पाण्डे (वडा वासि)

महेन्द्र श्री महेन्द्र प्रसाद कानु (मेघा) (सदस्यमध्य)

श्री लव बहादुर शुक्रेनु (वडा वासि)

इन्दर श्री [illegible] इन्दिरा कुमारी पन्त

श्री उषा पाण्डेय (ना.व.प)

Rama श्री रमा ब० शुक्रेनु

गोपाल श्री गोपाल प्र: कोइराला

रिता श्री रिता हरिजन

माया श्री माया चौलवाल

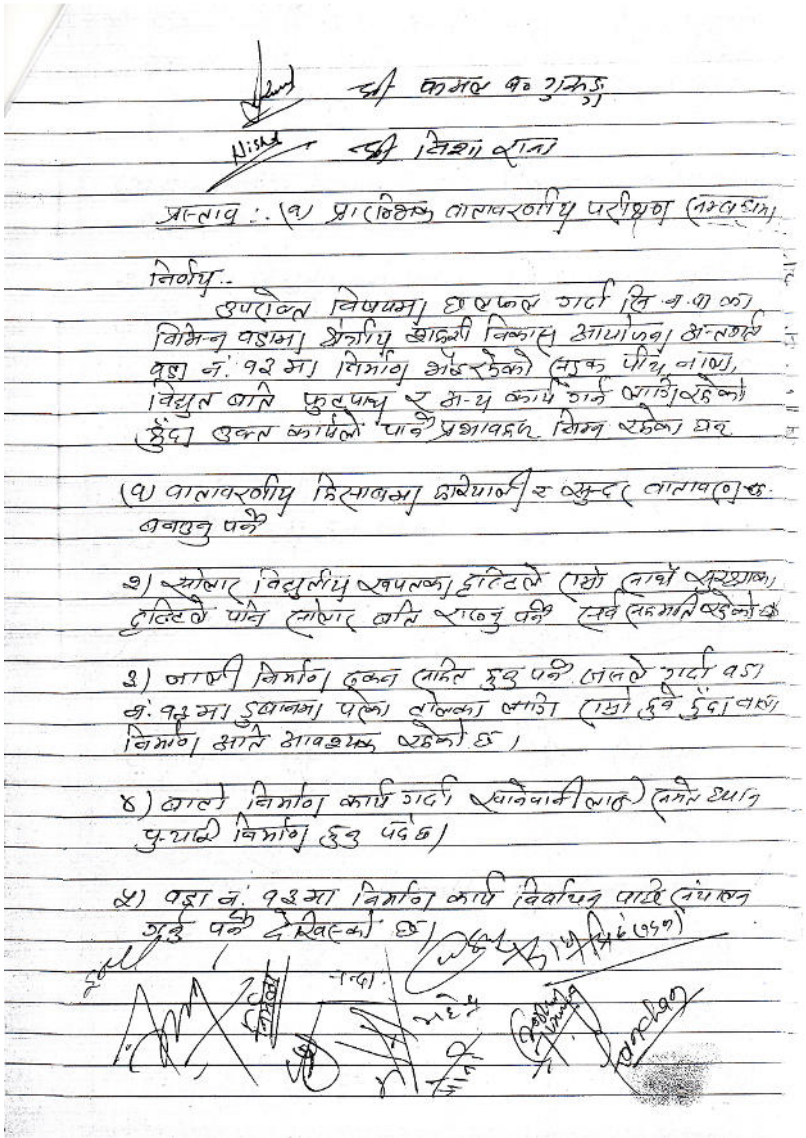
श्री पुरन थापा

श्री पुरन शुक्रेनु

मेक थापा श्री मेक ब० थापा

श्री किशोर क्षेत्रि क्षेत्री

श्री वेंकेश शुक्रेनु



English Translation:

The Project Implementation Unit (PIU)-Siddharthanagar held consultations on the IEE in eight wards of the municipality. The participants in each meeting included political party representatives, local elite, civil society representatives, and ward residents.

The PIU explained the project scope, expected impacts, and proposed mitigation measures. An English translation of a summary of the main issues raised by participants of the eight meetings is provided below.

- Ward No. 1 – The consensus was that the project was necessary and would lead to environmental improvements and would not lead to any lasting negative impacts. All participants signed the minutes. The ward Secretary was present.
- Ward No. 3 – The participants voiced several requests to the PIU, including for the project to: (i) plant greenery along the roads, and (ii) establish a ward level monitoring committee during construction. During the meeting, 5 members were selected for the ward level monitoring committee.
- Ward No. 5 – The participants requested that dust be controlled during construction. They also requested a divider on the main roads with greenery. Finally, they requested PIU to ensure regular monitoring and maintenance of the infrastructure.
- Ward No. 6 – The participants asked for greenery to be planted along both sides of the main roads and permanent flowerpots for the city's beautification. They asked the PIU to ensure that dust and pollution is controlled during the construction period by the regular sprinkling of water.
- Ward No. 8 – Like Ward No. 6, the participants asked for greenery to be planted along both sides of the main roads and permanent flowerpots for the city's beautification. They asked the PIU to ensure that dust and pollution is controlled during the construction period by the regular sprinkling of water. They also requested the installation of dust bins at regular intervals in the core area of the city.
- Ward No. 10 – The participants expressed their wish for the project to plant greenery. They also requested PIU to ensure that the construction materials are not dumped along the roads, that dust is effectively controlled, and that the trees and plants selected are appropriate for the climatic conditions.
- Ward No. 11 – The participants want greenery to be planted along the main roads and bus stops to be constructed. They are also asking for improved water facilities, which is beyond the scope of the project.
- Ward No. 12 – The participants are requesting for the PIU to ensure that dust pollution is controlled during construction and that greenery is planted along the roadsides.
- Ward No. 13 – The participants requested greenery for the city's beautification. They also requested solar street lamps and covered drains. They want the construction works to commence immediately after the elections and for the contractor to be cautious and not disturb their water pipes and supply during construction.

ANNEX- VIII: Photograps

Ward No.-1: Meeting

Ward No.-3: Meeting

Ward No.-4: Meeting

Ward No.-5 and 6: Meeting

Ward No.-7: Meeting

Ward No.-8: Meeting

Ward No.-10: Meeting

Ward No.-11: Meeting

Ward No.-12: Meeting