ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

EMERGENCY SUB-PROJECTS

REHABILITATION OF DUAL CARRIAGEWAY FROM KALA BOARD TO SAUDABAD CHOWRANGI AND CONNECTING ROADS TO NADE ALI AND URDU CHOWK NEIGHBORHOOD STREETS INCLUDING RCD GROUND & EXTENTION OF SOOMAR KANDANI ROAD IN MALIR & KORANGI AREA, MALIR, SINDH

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OSMANI عثمانی

Engineering - Architecture - Planning - Mapping - Technology

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ACRONYMS AND ABBREVIATIONS

AEE	Associate Executive Engineer
AP	Airport
BDL	Below Detection Limit
BOD_5	Biochemical Oxygen Demand
CC	Construction contractor
CBO	Community-based Organization
CO	Carbon monoxide
COD	Chemical Oxygen Demand
PSC	Project Supervision Consultant
DBH	Diameter at Breast Height
DC	Design Consultants
DCO	Deputy Commissioner Office
DMC	District Municipal Corporations
EA	Environmental Assessment
EC	E-Coli Count
ECA	Employment of Child Act
EHS	Environment, Health, and Safety
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Plan
EQS	Environmental Quality Standards
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FC	Fecal Coliform
FGDs	Focused Group Discussions
GFP	Grievance Focal Points
GoS	Government of Sindh
GRC	Grievance Redress Committee
GRM	Grievance Redressal Mechanism
GW	Ground Water
HH	Households
IDPs	In-Depth Interviews
KMC	Karachi Metropolitan Corporation
KNIP	Karachi Neighborhood Improvement Project
KWSB	Karachi Water and Sewerage Board
LG	Local Government
ND	Not Detected
NEQS	National Environmental Quality Standards
NGOs	Non-Governmental Organizations
NO	Nitrous oxide
NO_2	Nitrogen dioxide
NO_x	Oxide of Nitrogen
O_3	Ozone

OCL	Osmani & Company (Pvt.) Ltd.
OL	Out of Limit
OP	Operational Policies
Pak-EPA	Pakistan Environmental Protection Agency
PAPs	Project Affected Persons
Pb	Lead
PCRs	Physical and Cultural Resources
PEPA	Pakistan Environmental Protection Act
PEPC	Pakistan Environmental Protection Council
PIU	Project Implementation Unit
PKR	Pakistani Rupees
PM	Particulate matter
PMD	Pakistan Meteorological Department
PPE	Personal Protective Equipment
PSC	Project Supervision and Contract Management Consultant
RAP	Resettlement Action Plan
ROW	Right of Way
SDGs	Sustainable Development Goals
SEMP	Specific Environmental Management Plan
SEP	Sindh Environmental Protection
SEPA	Sindh Environmental Protection Agency
SEQS	Sindh Environmental Quality Standards
SLGA	Sindh Local Government Act
SMMP	Social Management and Monitoring Plan
SO_2	Sulfur dioxide
SOP	Standard Operating Procedures
SR	Sensitive Receptors
SSEMP	Site Specific Environmental Management Plan
SSWMB	Sindh Solid Waste Management Board
TA	Technical Assistance
TBC	Total Bacteria Count
TC	Total Coliform
TDS	Total Dissolved Solids
TNTC	Too numerous to count
TPM	Total Particulate Matter
TSS	Total Suspended Solids
UN	United Nations
WB	World Bank
WL	Within Limit
WW	Waste Water

EXECUTIVE SUMMARY

Overview the Sub-Project

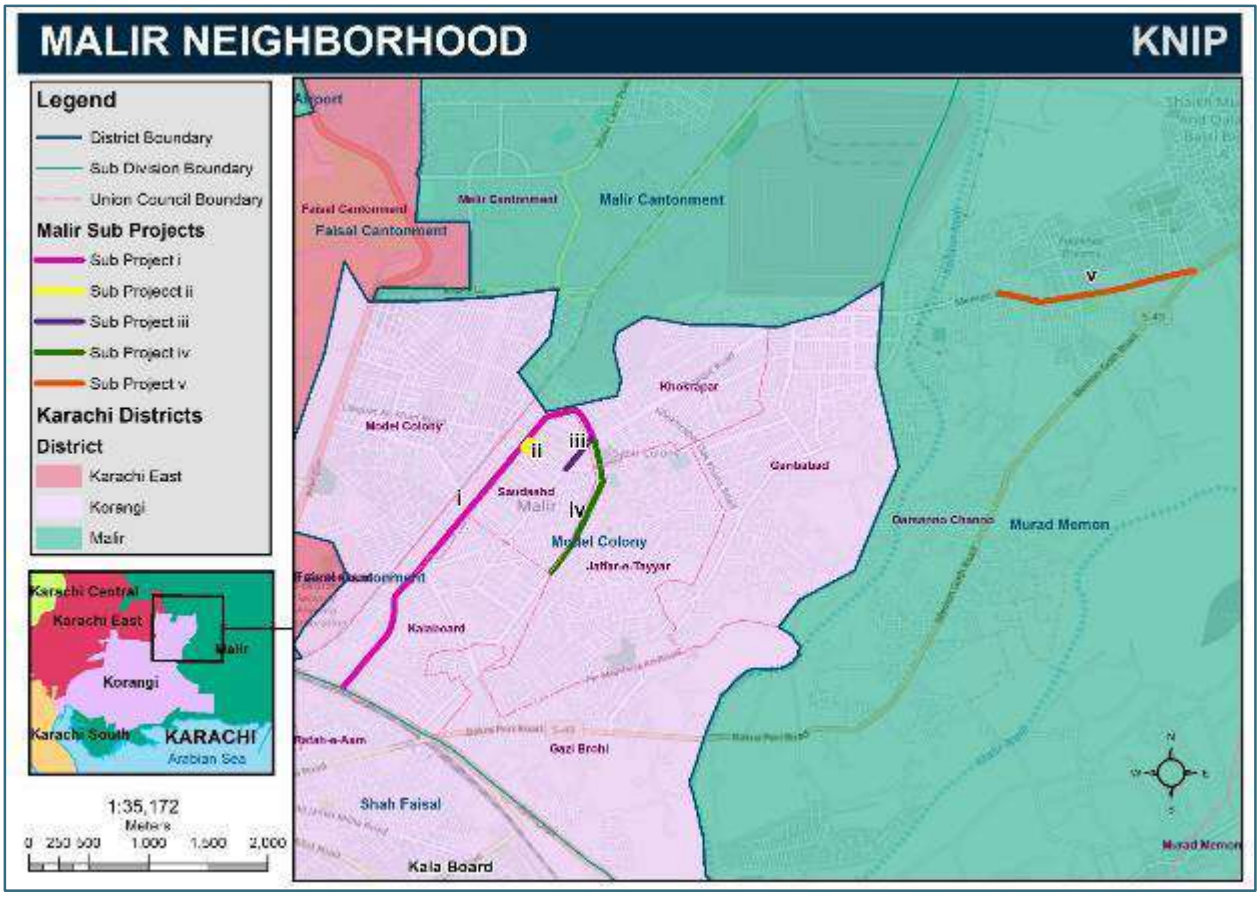
Karachi is the largest city of Pakistan and amongst top 10 cities of the world. It is the financial hub of the country and a major commercial and industrial center. Unfortunately, present living conditions in the city are not up to the mark. A study was conducted in 2016 with the support of the World Bank called Karachi Diagnostic Study (KCS) which suggested that the Karachi city immediately required substantial financial resources to improve its infrastructure and livability conditions of its inhabitants. As an outcome of the study, the Karachi Neighborhood Improvement Project (KNIP) was initiated by the Government of Sindh, with the financial and technical support of the World Bank. It is a four-year project, started in June 2017. The project has the following three components.

1. Public Space and Mobility Improvements in Selected Neighborhoods
2. Support to Improved Administrative Services and City Capacity Development
3. Support for Implementation and Technical Assistance

In August 2020, the city faced flash floods at the onset of the torrential rain of monsoon period that leads to the damage of infrastructure, drainage system, aesthetics, living conditions of inhabitants and loss of precious human lives.

Through this initiativ, Under Component 1 of KNIP Emergency Sub-Projects has been planned to be implemented in the targeted neighborhoods of Malir, Korangi and Sadar to rehabilitate the project areas which are badly affected due to heavy rain. It may ease the difficulties faced by residents and small businesses as a result of the rains aftermath. The main purpose is to rehabilitate the road / utilities infrastructure and enhancement of public spaces in the targeted neighborhoods of the Malir area (Korangi and Malir Districts).

The Design, Social and Environment team of OCL (the consultant) conducted various Consultation Meetings, Focus Group Discussion (FGDs), and In-depth Interviews (IDPs) with the sub-project stakeholders which include Local Residents (male and female), Sports and Youth Groups, Business Owners, Mobile Vendors and Small Cart Owners, Government Departments (Local Govt. DMCs), Utilities Agencies and NGO/CBOs. The overall purpose of the consultation was to share sub-project conceptual design with the stakeholders and acquire their feedback to incorporate in sub-project and to document Environment and Social Management Plan (ESMP) interventions (planning and design phase). In addition, to collect their consent for carrying out sub-project interventions; as well as to identify their concerns related to the sub-project and record their suggestions / recommendations. The respondents highlighted that existing state of the sub-projects area roads are in destitute condition. Lack of infrastructure, solid waste management and inadequate facilities for the residents and business communities were found to be the major issues. The respondents appreciated the development objectives and interventions. The suggestions and concerns of stakeholders were considered and addressed. The respondents from utility agencies emphasized that coordination between them and project developers should be established during construction phase to avid inordinate convenience to the residents.



Sub-Projects of Malir Neighborhood

The sub-projects include development of existing roads, footpaths, parks, green spaces, drainage system, sewerage system, water supply system and sports ground.

The targeted areas for Malir (Korangi District) Sub-Projects are:

i) Kala Board to Saudabad Chowrangi (3.2 km);

ii) RCD Football Ground (55,400 sq ft);

iii) Saudabad Chowrangi to Urdu Chowk Bus Stop (0.3 km); and

iv) Saudabad Chowrangi to Nade Ali road till Jinnah Square Chowrangi (1.2 km)

In addition, another Sub-Project falling in Malir District is:

v) Soomar-Kandani up to Murad Memon Goth Road (1.5 km)

Regulatory Review

Sindh Environmental Protection Act 2014 envisages protection, improvement, conservation and rehabilitation of environment and provides legal cover for action against polluters and aims for general awareness of communities. Most of these regulations are in-line with Pakistan Environmental protection act (1997) revised in 2001. The discharge or emission of any effluent, waste, air pollutant or noise in an amount, concentration or level in excess of the Sindh Environmental Quality Standards (SEQS) as specified by the Sindh Environmental Protection Agency (SEPA) has been prohibited under the Act, and penalties have been prescribed for those

contravening the provisions of the Act. This sub-project ESMP has fulfilled the requirements of this Act.

The World Bank requires Environmental and Social Assessment (ESA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve decision making process. This Sub-Project has triggered the Bank's policy OP 4.01 on Environmental Assessment.

Operational Policies (OPs) of World Bank and their management under ESMF

OP 4.01 - Environmental Assessment: These Emergency Sub-Projects are classified as "Category B" project per the WB Environment Category since the activities and Sub-Project interventions are expected to have environmental and social impacts which can be mitigated.

Environmental Assessment

This Environmental and Social Management Plan (ESMP) report presents the site-specific baseline data collected to identify the environmental and socioeconomic impacts of interventions in the sub-project areas. Assessment and evaluation of the level of impacts, their management and monitoring plan are also defined in this report.

Baseline Data Collection: After a detailed review of project appraisal document and an aerial remote sensing-based pre-survey via drones and high-resolution satellite data, detailed on-ground environmental and social surveys were conducted by the ESMP Consultant to collect field information for the sub-project areas of Malir. The ground environmental survey was focused on collection of specific ecological and environmental baseline information of the sub-project areas including parameters of meteorology, topography of the area, air and noise quality, water and wastewater assessment, floral and faunal diversity and traffic situation.

The topography of the sub-projects of Korangi district range from 22.081 m at Kalaboard to gradually sloping to 32 m at Saudabad Chowrangi. While the Sub-project-V in Malir district displays elevation variation from 38 m to 39 m. During Monsoon, major water stagnation was observed on the roads in the four sub-projects of Korangi district which is why the sub-project interventions were triggered.

The sub-projects areas lack substantially in flora and fauna because of intense urbanization. The five sub-projects areas collectively have only 205 trees located in the line-of-sight found along the footpaths and inside private and governmental properties. The ambient air, noise, ground water and wastewater quality observed and recorded in the environmental baseline of this ESMP shows that the air quality and noise levels are within the required Sindh Environmental Quality Standards (SEQS) limits.

The groundwater and wastewater quality assessment were performed as per SEQS recommendation. The results revealed that in groundwater sample the parameters including Total Bacteria Count, Total Coliform, *E.Coli*, Fecal Coliform, Total Dissolved Solid, Total Hardness, Chloride, Nitrate and Nitrite have exceeded levels as compared SEQS. The rest of water quality parameters were within permissible limits. In wastewater sample, out of thirty-two (32) parameters, sixteen (16) parameters were above than the permissible limits.

Thaddo Nalla is located within 3 km vicinity of the Sub-project-V (Soomar-Kandani up to Memon Goth Road) but no impacts are anticipated on the water stream as a result of sub-project

interventions. A roadside storm water drain is found in Sub-project-I (Saudabad Chowrangi to Kala Board), which is open at approximately 75 locations and is also serving as dumping ground of garbage. Sub-project-I design aims to clear the garbage, segregate sewer and storm water and cover the open drain to contain spread of any vector-borne diseases.

In total fifty-two (52) sensitive receptors were identified which includes fifteen (15) educational institutions, thirteen (13) Mosques, four (04) Imam Bargah, twelve (12) Medical Facilities, one (01) Fire Station, one (01) Police Station, one (01) Mortuary, one (01) Graveyard and four (04) Government Offices. Sub-project interventions do not touch the boundary of any of the sensitive receptor.

The social survey is mainly focused on specific aspects of the sub-projects area including health and education, infrastructure, gender, sensitive receptors, utilities, sewerage and solid waste management and the survey of land use. Ownership of the households (HH) is either self-owned or rented in the sub-project area from Saudabad to Kala Board, Saudabad to Urdu Chowk and Saudabad to Jinnah Square. In sub-project of Soomar-Kandani to Murad Memon Goth road, household type is mainly newly developed apartment buildings and small villas, but the land use in the neighborhood is mainly rural. The Socio-Economic profile of HHs is developed from 20 randomly selected HHs residing in the sub-project area. It was observed during the survey of the Socio-Economic profile that the average size of the HH was above 10 persons in a family. The Socio-Economic profile of 18 randomly selected shops was mainly collected form mobile hawkers and roadside shops on the sub-project roads. Majority of economic landscape is owned by individuals, who only use the sub-project areas for commute and commercial purposes.

As the sub-projects identified in Malir neighborhood are densely populated, utility facilities like water supply, sewerage, electricity, telephone, internet, and cable services exist to serve the resident population. The existing water supply lines in the area especially along Kalaboard to Saudabad Chowrangi Road are very old warranting emergent replacement. However, scarcity of water supply is a common problem for the entire Karachi city with Malir Area being no exception. Ground water is being used by drilling boreholes in some areas of Malir neighborhood to fulfill the water requirements. Although a storm water drains (*nala*) exist along Kalaboard to Saudabad Chowrangi Road passing through RCD Ground, it is primarily being used by residents for sewerage. The residents along the road have made sewer connection to the drain (nala). A recently laid trunk sewer along Kalaboard to Saudabad Chowrangi road has been laid in center of carriageway leading to settlement and road damages which was never repaired. Therefore, the entire sub-project area is devoid of any proper drainage system leading to extensive road damages during last year heavy rainfall.

Mitigation Measures

Appropriate mitigation measure shall be adopted to avoid, minimize or compensate the potential adverse impacts of the project during pre-construction, construction and operation phase, including:

- EMP will be part of contract document for implementation. Contractor will prepare Sight Specific Environmental Management Plan (SSEMP) at preconstruction stage ensuring the compliance of EMP;

- Provision of dust masks, and installing the pollution controlling devices such as Electrostatic Precipitator (EP), bughouse filters to asphalt plant, covering of materials and stockpiles, speed limits, cleanup of public roads and best practices for site management;
- Label all the trees which need to be removed, planting the compensatory trees (five trees for every single tree), grass and sapling aftercare and planting the trees at construction stage and not in the operation stage;
- Appropriate siting and management of sub-projects related facilities such as construction camps, borrow pits, asphalt and batching plants;
- Procurement of construction materials from approved quarries and crushers. Water Conservation: through recycling for dust suppression, prevention of pipe leakages and wastages of raw materials;
- Best practices to be adopted for energy conservation such as machinery to be shut off while not in use and preservation and track record of raw materials;
- Protection of water quality of rivers and canals, discharging wastewater through septic tanks of appropriate size, covering the manholes, and well-maintained washing facility;
- Eliminating the workplace hazards, provision of Personnel Protective Equipment (PPEs), lavatories and showers, equipped kitchen & clean eating areas, first aid kits, drinking water and ambience;
- Contractor and workers must observe Strict SOPs during the waves of COVID-19/other infectious diseases, especially at the places of human agglomeration; and
- Disease control by avoiding water impounding, restricted access, traffic control, covering the trenches and openings, and no abandoned structures.

Implementation cost

All of the environmental and social management activities will be undertaken by the Contractor. For this purpose, the cost of the ESMP Implementation Budget activities will be included in the Contractor Budget and Bill of Quantities (BoQs) in accordance to the procurement rules and regulations. The budget for the ESMP Implementation for the Sub-Project is PKR 7.65 million.

Conclusion

This ESMP study reveals that the proposed sub-projects will not lead to significant adverse environmental and social impacts of such nature or magnitude that would require a more detailed report in the form of an EIA. Furthermore, careful implementation of the ESMP will ensure that environmental impacts are managed and minimized and the sub-projects proponent meets all statutory requirements.

It is therefore submitted that by keeping in view the importance of the project for the general public this ESMP study may be approved to provide faster, safer and environmental-friendly facility to the commuters and a new avenue of development in this deprived area of Karachi.

Chapter 1. INTRODUCTION

Karachi is a megalopolis city of Pakistan, the city of opportunity for the people of Pakistan, coming from various parts of the country. It is a financial hub and industrial capital of the country. It is quite diverse in terms of its population and ethnicity as compared to other cities of Pakistan. The city needs special recognition in the context of the improvement in the infrastructure. The city is in dire need to be improved considering its complex demographics. The ongoing COVID-19 situation has already brought many activities and livelihoods to almost halt. It is need of hour to build Karachi into a more livable city.

To rehabilitate Karachi, Government of Sindh (GoS) took a timely initiative, with the support of the World Bank (WB) to transform the city into a more habitable place. GoS has already been working and has completed several projects that are visible and have high impact results on the ground. The projects have already built confidence between government and citizens, while setting the stage and platform for a long-term sustainability. Therefore, GoS with the support of World Bank undertook "Karachi Neighborhood Improvement Project" (hereafter referred to as KNIP). A joint endeavor between KNIP and GoS was initiated, funded by the World Bank. Osmani & Company (Pvt) Ltd is providing the consultancy services for the detailed engineering design and construction supervision of **Emergency Sub-Projects in Malir**. The objective of the Sub-Projects is to enhance public spaces, urban road infrastructure, mobility, inclusion, and access to the market in the targeted neighborhoods in Karachi.

The Emergency Sub-Projects are centered on three key areas: i) to improve livability, safety and inclusion in targeted areas through public space enhancements and improved access to citizen services in selected neighborhoods; ii) to initiate a mechanism for instituting inclusion between the provincial and local government levels, private sector and civil society; and to better engage citizen participation; and iii) to support the preparation of follow-on larger investment and policy reforms operations. The objective of sub-projects of Malir neighborhood is specifically to rehabilitate the area by improving mobility and quality of life for residents and providing quality outdoor spaces to meet citizen's needs.

This Environmental and Social Management Plan (ESMP) report presents the sub-project site-specific baseline data collection for air, water, land, biological and Socio-Economic situation of the sub-projects area. In addition, the identification, prediction and evaluation of project impacts and preparation of environmental management and monitoring plan for mitigation of adverse impacts that may arise due to the proposed interventions.

The KNIP project aims to enhance public spaces in targeted neighborhoods of Karachi and improve the city's capacity to provide selected administrative services. The project will focus on three key areas:

(i) Improve livability, mobility, safety and inclusion in targeted areas of Karachi city through public space improvements in selected neighborhoods and improved access to pedestrian facilities

(ii) Initiate mechanisms for inclusive decision making and planning for the city with different levels of government (provincial and local), private sector and civil society; and to promote citizen participation in this process, and

(iii) Strengthen city management and institutional capacity while supporting the preparation of a possible follow-on operation in Karachi focused on larger investments and policy reforms.

The project has three main components. The infrastructure component aims to improve livability, mobility, safety and inclusion through public urban space improvements in selected Neighborhoods in Karachi (including both commercial and/or residential areas). The Emergency Sub-component 1.1 includes Malir Areas Rehabilitation to be completed in six months; In first phase, Malir Area as Priority Emergency Sub-Project has been selected for the implementation of KNIP.

1.1 EMERGENCY SUB-PROJECTS OVERVIEW

Emergency sub-projects are to be implemented in the targeted areas to rescue the areas after annual rains and to compensate for the difficulties faced by residents and small businesses as a result of the rain aftermath. The main purpose is to rehabilitate and enhancement of public spaces in the targeted neighborhoods of the Malir area and improve the city's capacity to provide selected administrative services. Development of roads, footpaths, parks, green spaces, public toilets, drainage system, sewerage system, water supply system, and football ground.

The emergency sub-projects include:

i) Kala Board to Saudabad Chowrangi (3.2 KM)
ii) RCD Football Ground
iii) Saudabad Chowrangi to Urdu Chowk Bus Stop (0.3 KM)
iv) Saudabad Chowrangi to Nade Ali Road till Jinnah Square Chowrangi (1.2 KM)
v) Soomar Kandani to Murad Memon Chowk Road (1.5 KM) of Malir district.

Saudabad is a neighborhood in Karachi that is within Korangi District. It was named after King Saud of Saudi Arabia. The Sub-Project targeted areas mentioned above are part of Saudabad area of Korangi District except for the Soomar Kandani to Memon Goth road which is situated in Malir District.

i) Kala Board to Saudabad Chowrangi (3.2 KM)

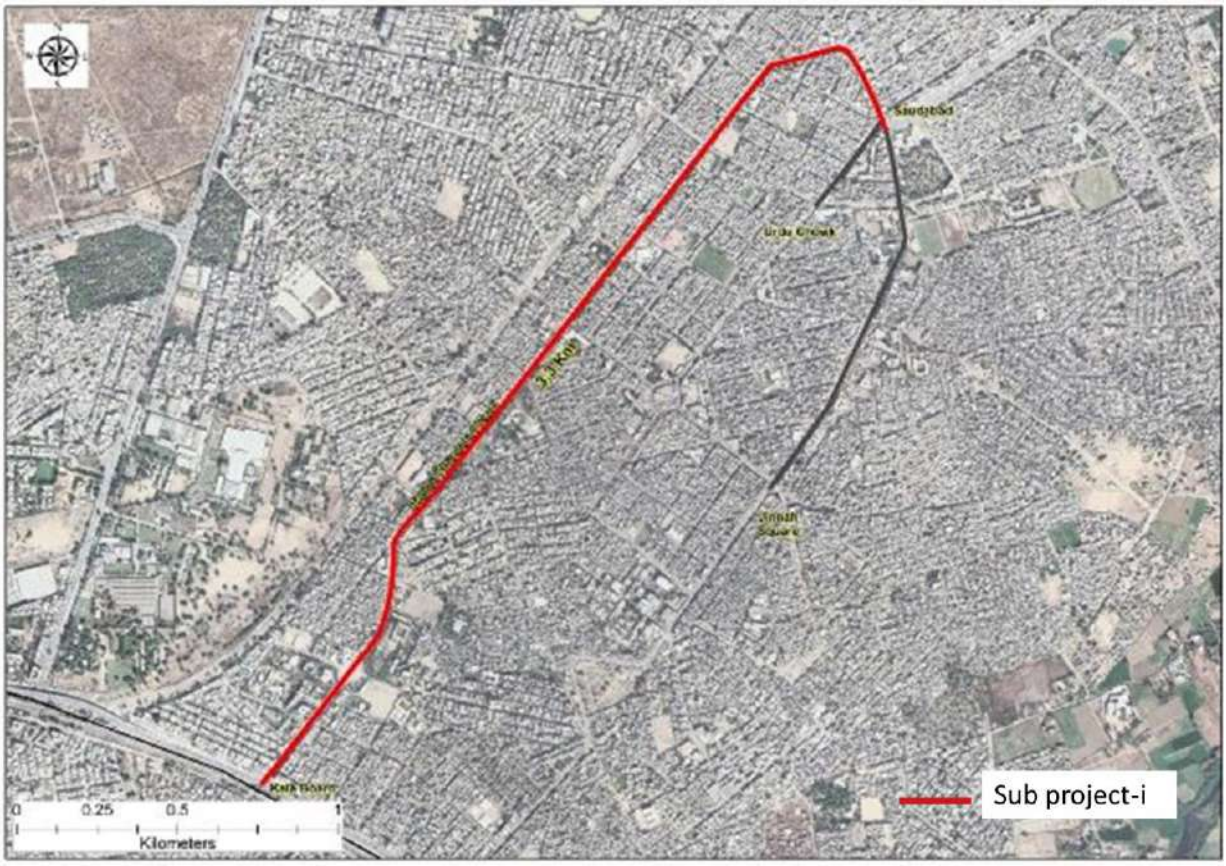


Figure 1-1 Location Map of Kala Board to Saudabad Chowrangi Road

The road from Kala Board to Saudabad Chowrangi is 3.2 km in length as shown in Figure 1-1. There are shops, parks and playgrounds, government schools, government colleges, laboratories, mosques and a police station along the sub-projects' road. It is a dual carriageway road with three lanes on either side with 1m median and variable footpath / utility corridor on either side. The existing Right of Way (ROW) of the road varies from 23.2 m to 29.4 m. The road surface of one of the carriage ways on right side is badly damaged due to recently laid sewer line. Some of the road patches at low points are severely damaged due to lack of proper road surface drainage. The existing condition of road is depicted in Figure 1-2**.** Lack of traffic signs and road markings are leading to safety hazards for road users and prone to accidents. Keeping in view the above problems the road improvement / rehabilitation work has been considered as an emergency work to provide relief to the community.

Figure 1-2 Existing Condition of Kala Board to Saudabad Chowrangi Road

ii) RCD Football Ground

The RCD ground is located near Saudabad Chowrangi along Begum Khursheed Road as shown in Figure 1-3. The surrounding area of RCD ground is residential cum commercial as depicted in Figure 1-4. The total covered area of RCD ground is 55,400 sq. ft.

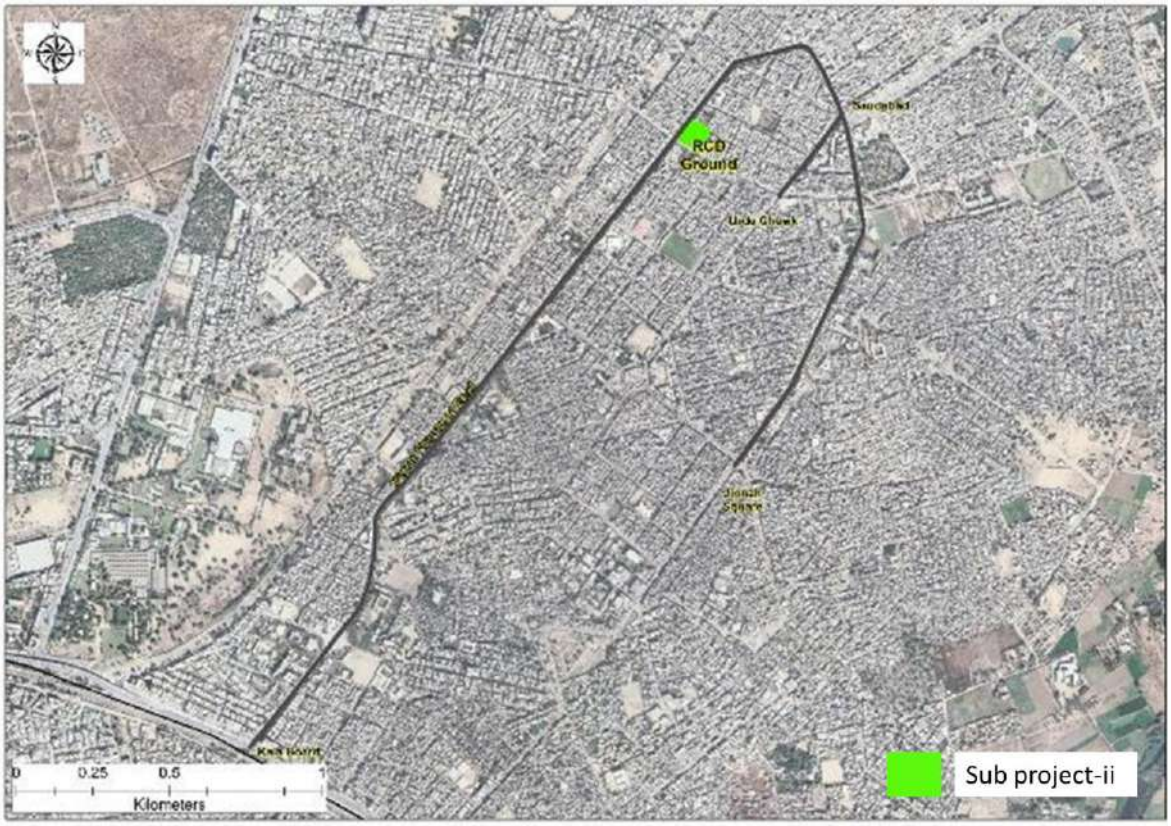


Figure 1-3 Location Map of RCD Ground

Figure 1-4 Drone Image of Existing RCD Ground

iii) Saudabad Chowrangi to Nade Ali road till Jinnah Square Chowrangi (1.2 KM)

The road from Saudabad Chowrangi to Jinnah Square (Nad-e-Ali) is 1.2 km in length as shown in Figure 1-5. There are shops, schools, sport stadium, Government institutes, mosques, graveyard and Imam Bargah along the sub-project road. It is a dual carriageway road with two lanes on either side with 0.76m to median and 1.82m footpath / utility corridor on both sides. The existing ROW of the road varies from 20.0 m to 30.0 m. One of the carriage ways on left side is not fit to drive and mobility is badly effected due to leaking utilities, water flowing, ponding and extensive damages to the road / pavement structure. The sewerage network is quite problematic and gets choked frequently. Proper footpaths and streetlights are not available. Due to solid waste dumping along the road, mobilization of the community on left track of the road is almost zero. The existing condition of road is identified in Figure 1-6**.** Keeping in view the above problems the road rehabilitation work has been considered as an emergency work to provide relief to the community, especially to the mini sport stadium, graveyard and fire station users.

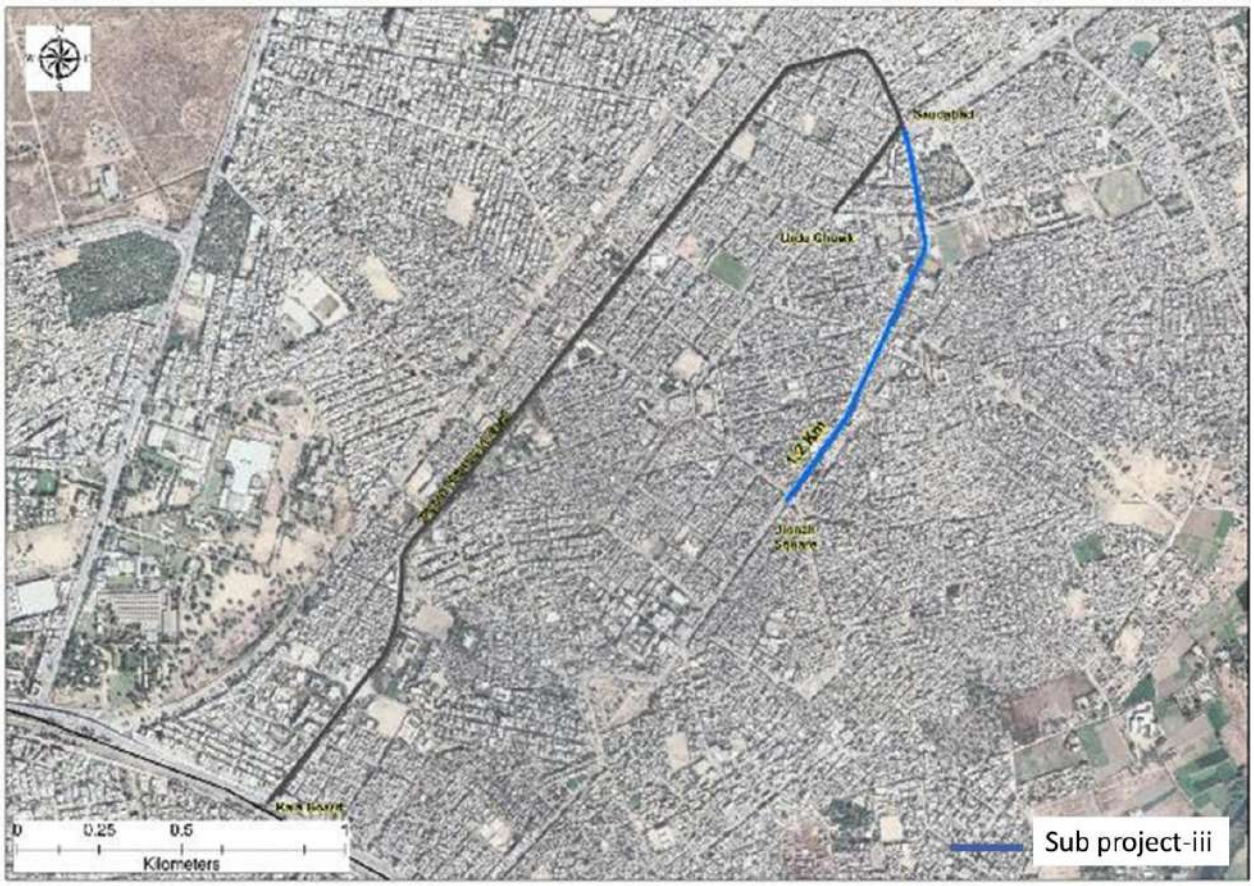


Figure 1-5 Location Map of Saudabad Chowrangi to Jinnah Square Road

Figure 1-6: Existing Condition of Saudabad Chowrangi to Jinnah Square Road (Nad-e-Ali)

iv) Saudabad Chowrangi to Urdu Chowk Bus Stop (0.3 KM)

The road from Saudabad Chowrangi to Urdu Chowk is 330m in length as shown in Figure 1-7 there are shops, schools, colleges and mosque along the road. It is a single carriageway road with existing ROW of 16.44m, carriageway width of 10.34m, 1.82m footpath on right side and 4.2m foot path on left side. Proper foot paths are not available making the movement of the students from the existing Girl's College quite difficult and streetlights are also not available. Lack of traffic signs and road markings are leading to safety hazards for road users and prone to accidents. The existing condition of road is depicted in Figure 1-8**.** Keeping in view the above problems, the road rehabilitation work has been considered as an emergency project to provide relief to the community.

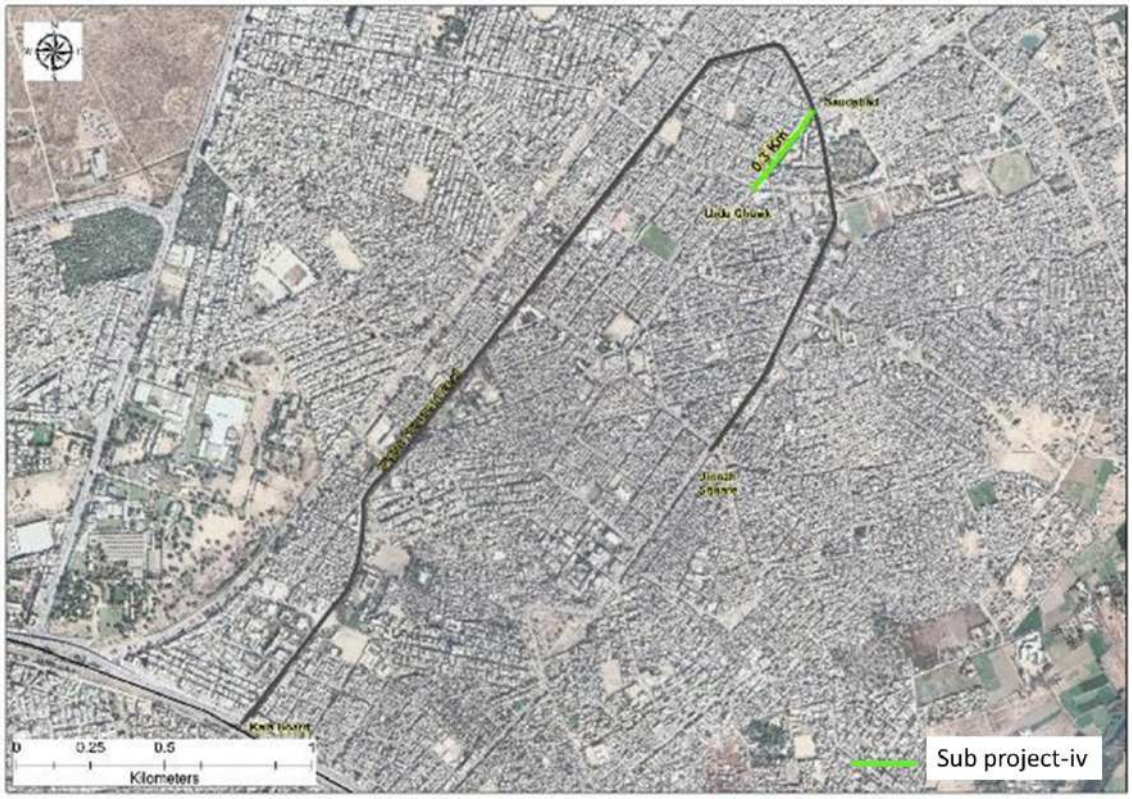


Figure 1-7 Location Map of Saudabad Chowrangi to Urdu Chowk Road

Figure 1-8 Existing Pavement Condition at Saudabad Chowrangi to Urdu Chowk Road

v) Soomar Kandani to Murad Memon Chowk Road (District Malir)

The road from Soomar Kandani to Murad Memon Chowk is 1.5 km in length as shown in Figure 1-9. This road is connecting Khokhrapar Road with Memon Goth. There is built-up area on right side of road, but left side area is under development. Presently the road is a single carriageway with low traffic volume. The ROW of existing road is 16.50m, with 8.80m carriageway, 4.80m green belt / shoulder on right side and 2.90m green belt / shoulder on left side. The existing condition of road is presented in Figure 1-10. Keeping in view the future development along the project road, it is being dualized with road rehabilitation and widening considered as an emergency work to fulfill the present and future requirements of the community.

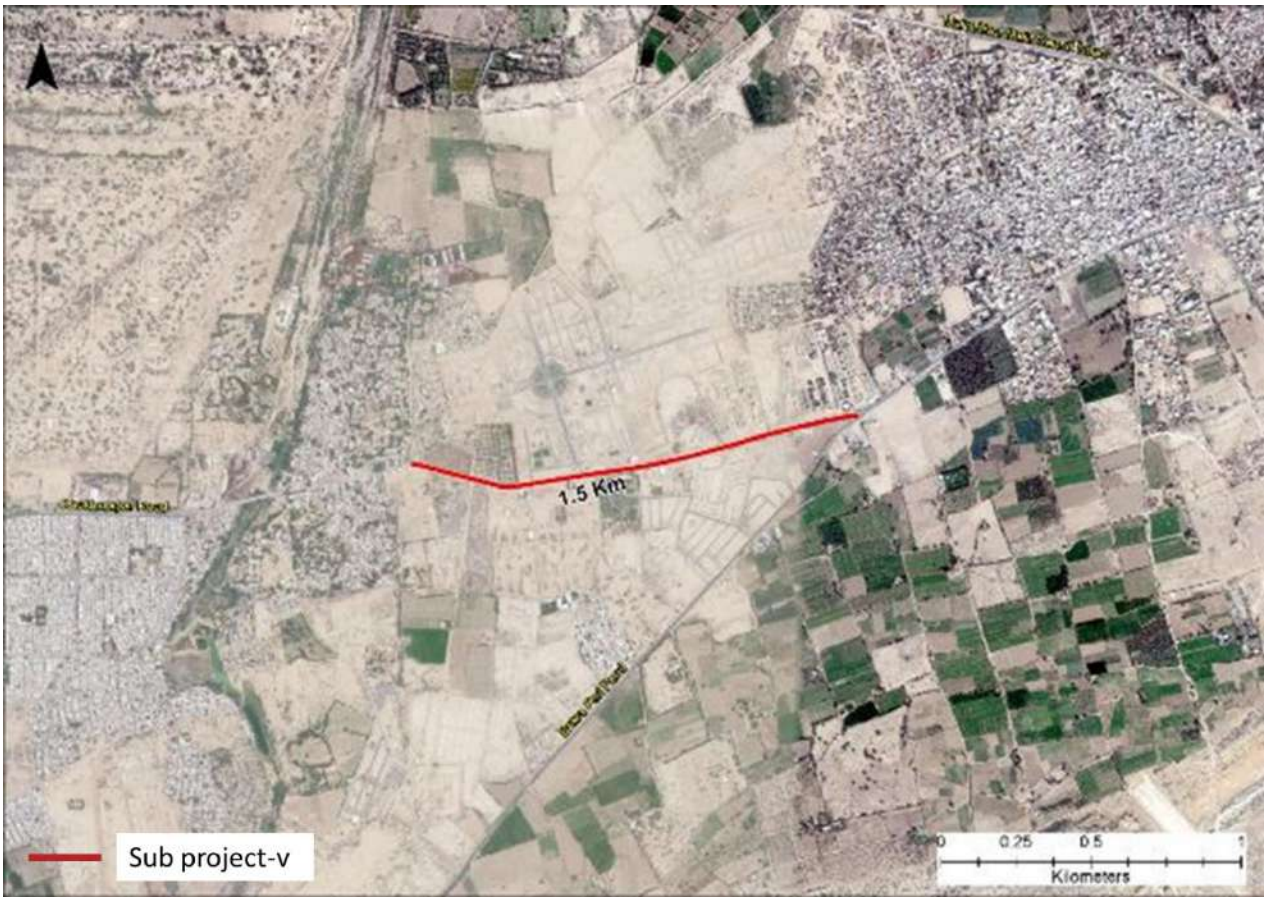


Figure 1-9 Soomar Kandani to Murad Memon Chowk Road

Figure 1-10 Existing Condition of Soomar Kandani to Murad Memon Chowk Road

1.2 Environmental and Social Management Plan (ESMP)

ESMP is a very important document required by the World Bank before the initiation of the project.

Environmental and Social Management Framework (ESMF) as outlined by WB "is an instrument that examines main issues and impacts associated with the Project. It prepared in the beginning of the project. The ESMF sets out the principles, rules, guidelines and procedures to assess the environmental and social impacts".

A separate ESMP has developed for each sub-project by following the guideline mentioned in ESMF. However, in some cases a combined ESMP is prepared for few sub-projects which are closely located and there Socio-Economic and environmental situation and impact are same. This ESMP also cover five sub-projects due to same reasons. It contains measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts, provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project impacts.

1.2.1 Need and Purpose of the Study

The Bank requires Environmental and Social Assessment (ESA) of projects/sub-projects proposed for Bank financing to help ensure that they are environmentally and socially sound and sustainable, and thus to improve decision making.

Sindh Environmental Protection (SEP) Act 2014 being as principles legislation of environmental protection in Sindh Province envisages protection, improvement, conservation and rehabilitation with the help of legal action against polluters and green awakening of communities. SEP Act is

an offshoot of the Pakistan Environmental Protection Act promulgated in 1997. This act envisages the discharge or emission of any effluent, waste, air pollutant or noise in an amount, concentration or level in excess of the Sindh Environmental Quality Standards (SEQS) specified by the Sindh Environmental Protection Agency (SEPA) has been prohibited under the Act, and penalties have been prescribed for those contravening the provisions of the Act. The Sub-Project ESMP has been prepared based on the principles of this Act.

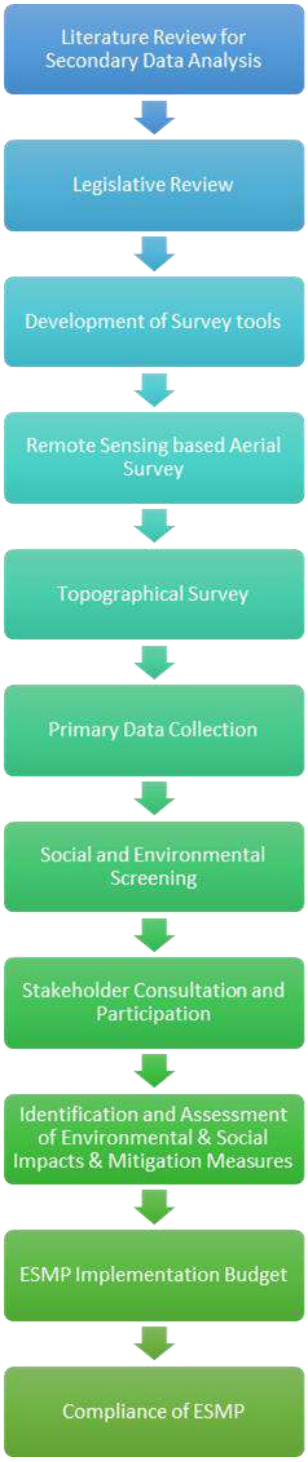


Figure 1-11 ESMP Methodology

ESMP is also compliant with local legislations especially local labor legislations as stated in section 3.1.5, which includes protection against harassment of women in the workplace, child labor, bonded labor, workmen's compensation, and minimum wages.

1.2.2 Objectives of the ESMP Study

The objective of development of an Environmental and Social Management Plan (ESMP) for Emergency Sub-projects is to document, mitigate and monitor adverse environmental and social impacts identified in the Environmental and Social Management Framework (ESMF) developed for this project.

This ESMP complies with the WB safeguards requirements given in all triggered Operational Policies. The ESMP also complies with the national environmental requirements defined through Sindh Environmental Protection Act of 2014, subsequent regulations and guidelines, and also the provincial Acts and Regulations.

1.2.3 Study Methodology

Methodology for the ESMP comprises a series of integrated tasks that were carried out by the Consultant. This was based on a combination of fieldwork (*e.g.*, environmental and social surveys, stakeholder consultations etc.) and desk reviews as deemed necessary to meet the needs of the ESMP as per the guidelines of World Bank.

Project documents have been reviewed to reflect the proposed interventions in Emergency Sub-Projects. This information is collected and analyzed as part of ESMP process. Legislative Review: A legislative review has been conducted for the sub-projects. This included a review of all the related national and provincial legislation, guidelines and WB OPs which are relevant to the sub-projects and applicable in conducting ESMP study.

Environmental and Social Surveys: After the review of the Sub-Project information, detailed environmental and social surveys were conducted by OCL to collect primary information for the sub-projects area. The environmental survey was mainly focused on collection of specific baseline information of the sub-projects area including meteorology, air and noise quality, water and wastewater

assessment, identification of flora and fauna species present in the area including shaded trees, traffic situation and topography of the area. The social survey was focused on the specific aspects of sub-projects area including health and education facilities, infrastructure, utilities, gender, sewerage and solid waste management and identification of land use. The socioeconomic data was collected from students, teachers, government servants, bus and rickshaw drivers located in the sub-projects area as well as individuals from business community who although reside outside the areas of interest but use the sub-projects roads to commute. The survey for identification of PAPs was done through a transect walk technique by the Social Specialist, Land Surveyors and Environment team of OCL Team, as well as drone based aerial surveys of sub-projects area.

Stakeholder Consultation and Participation: Stakeholder consultations were carried out as an important component of ESMP. A series of interviews were undertaken with primary and secondary stakeholders including residents (male and female) students, teachers, government servants, bus and rickshaw drivers, businesses, vendors and daily commuters. Meetings were held with institutional stakeholders and key environmental and social issues were discussed. In addition to that, meetings were held with Korangi DMC and Utilities companies such as K-Electric, KW&SB, and PTCL, etc. to streamline the construction and development stages of the sub-projects.

Identification and Assessment of Environmental and Social Impacts and Mitigation Measures: Environmental and Social aspects and their associated impacts are considered for proposed interventions under the sub-projects. Specific mitigation measures are being proposed to minimize the significant environmental and social impacts. Environmental Management and Monitoring Plan (EMMP) and Social Management and Monitoring Plan (SMMP) have been developed for the implementation of the mitigation measures identified during the study.

ESMP Implementation Budget: Budgetary requirements have been proposed against the monitoring, training and reporting activities proposed for the sub-projects.

1.2.4 Layout of ESMP

Chapter 1 provides the introduction and background of the project and sub-projects. **Chapter 2** provides a detailed description of the sub-projects and the implementation requirements to execute the sub-project. The relevant local legislative requirements and WB operational policies applicable for development and implementation of ESMP are described in **Chapter 3.** The environmental baseline conditions of sub-project area are presented in **Chapter 4**. The social-economic profile of sub-project roads is presented in **Chapter 5**. The assessment of environmental as well as socioeconomic impacts, their mitigation measures are presented in **Chapters 6.** **Chapter 7** provides the Grievance Redress Mechanism. The stakeholder consultations and information disclosure have been covered in **Chapter 8**. Environmental Management and Monitoring Plan including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate) are described in **Chapter 9**. **Chapter 10** provides the Social Management and Monitoring Plan including measures to be taken to reduce and mitigate any adverse impacts on local people and communities. **Chapter 11** covers the ESMP budgetary requirements. **Chapter 12** presents conclusion and recommendations of the study. In the end, detailed tables of Environmental Quality reports, Attendance sheets of Consultations and Traffic Survey Data is annexed.

1.3 COMPLIANCE WITH ESMP

This ESMP forms part of the Request for Proposals package/ Bid Documents and its compliance is mandatory. The contractor will be required to prepare site specific ESMP for each sub-project-based mitigation and monitoring measures in the sub-projects ESMP. These site specific ESMPs will then be embedded into the civil works contracts and therefore will be legally binding on the contractor. The site specific ESMP must be submitted to the PIU/Supervising Engineer for review and clearance within 30 days of the signing of the contract or before mobilization on site, which ever date is earlier.

1.4 STUDY TEAM

Table 1-1 Study Team

S. No	Name	Designation
1	Engr. Amir Ali Wassan	Team Leader
2	Lieutenant Colonel Ajmal Rasheed (Retired)	Contractor and Procurement Highway Specialist
3	Engr. Nadeem Shaikh	Head of Urban Space designer
4	Arch. Nadia Masood	Landscape Architect
5	Engr. Ishraq Shamim	Structure Designer Engineer
6	Engr. Farhan Ali	Electrical Engineer
7	Mr. Syed Haider Abbas Zaidi	Resettlement/ Social Safety Specialist
8	Dr. Rafay A. Siddiqui	Wet Services Specialist
9	Dr. Jamil Hasan Kazmi	Senior Environmental Expert
10	Dr. Saima Shaikh	Spatial Ecologist
11	Mr. Tanveer Arif	Social Coordinator
12	Ms. Maryum Khan	RS & GIS Specialist
13	Ms. Eram Masood	Social and Gender Specialist
14	Ms. Mavish Mazhar	Social Impact Associate
15	Ms. Mulyca Khan	Community Coordinator
16	Misbah Ghouri	Environment Specialist

Chapter 2. SUB-PROJECTS DESCRIPTION

The main purpose of implementation of sub-projects is to rehabilitate the existing road network and enhancement of public parks in the neighborhoods of the Malir area (Korangi and Malir Districts) and improve the city's capacity to provide selected administrative services.

The selected sub-projects for Malir Neighborhood (Korangi and Malir Districts) are:

i) Kala Board to Saudabad Chowrangi (3.2 KM)
ii) RCD Football Ground
iii) Saudabad Chowrangi to Urdu Chowk (0.3 KM)
iv) Saudabad Chowrangi to Nade Ali Road till Jinnah Square Chowrangi (1.2 KM)
v) Soomar Kandani to Murad Memon Chowk Road (1.5 KM) of Malir district.

The existing conditions of all the sub-projects are discussed in Chapter 1, this section will focus more on proposed design of sub-projects:

2.1 KALA BOARD TO SAUDABAD CHOWRANGI (3.2 KM)

2.1.1 Proposed Cross section

The 3+3 lane dual carriageway on either side with variable lane widths as per available space will be rehabilitated / reconstructed as per road condition survey. Existing 1-meter wide median will be retained with renovated / new electric poles with LED Lights and trees plantation as per site requirements. The existing nala carrying both sewerage and storm water combined will be segregated into separate sewer pipe with manholes towards boundary side and storm water pipe drain. Separate storm water pipe drain will be provided on both sides to cater the road surface water. New water supply lines to replace old leaking lines will be laid on either side as per KWSB requirements. Existing footpaths on either side will be rehabilitated and renovated with new planters / trees and sitting areas with benches for local community. Traffic signs and road markings will be provided for facilitation of road users including vehicles and pedestrians.

Right carriageway is being reconstructed due to damages caused during recently laid sewer line. Left carriageway is being rehabilitated to improve the existing pavement. Where storm water pipe is being laid reconstruction of road will be required. The existing and proposed cross sections applicable to various chainages are depicted in Figure 2-1 to Figure 2-4.

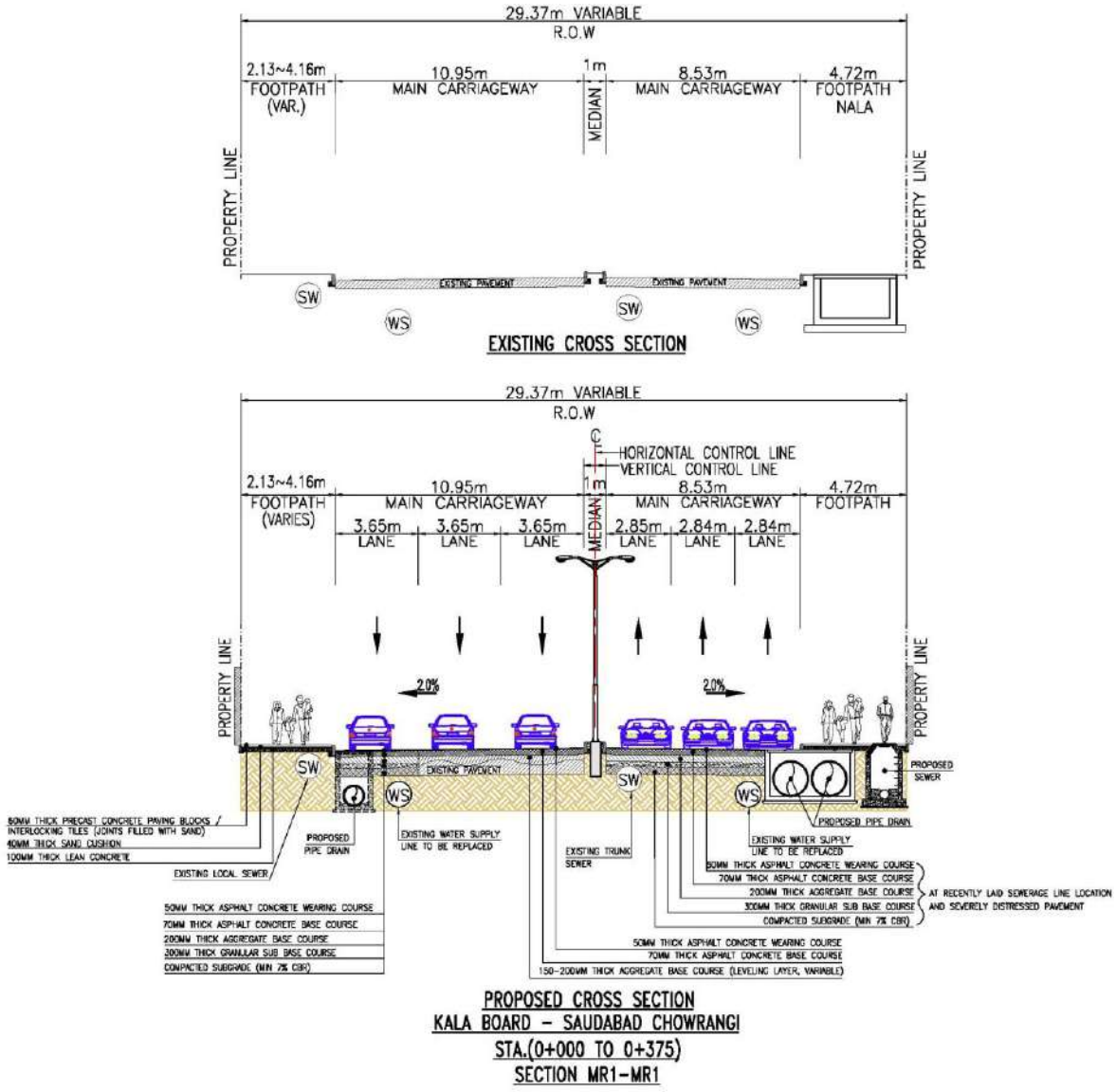


Figure 2-1 : Existing and Proposed Cross Section of Kala Board to Saudabad Chowrangi (0+000 to 0+375 km)

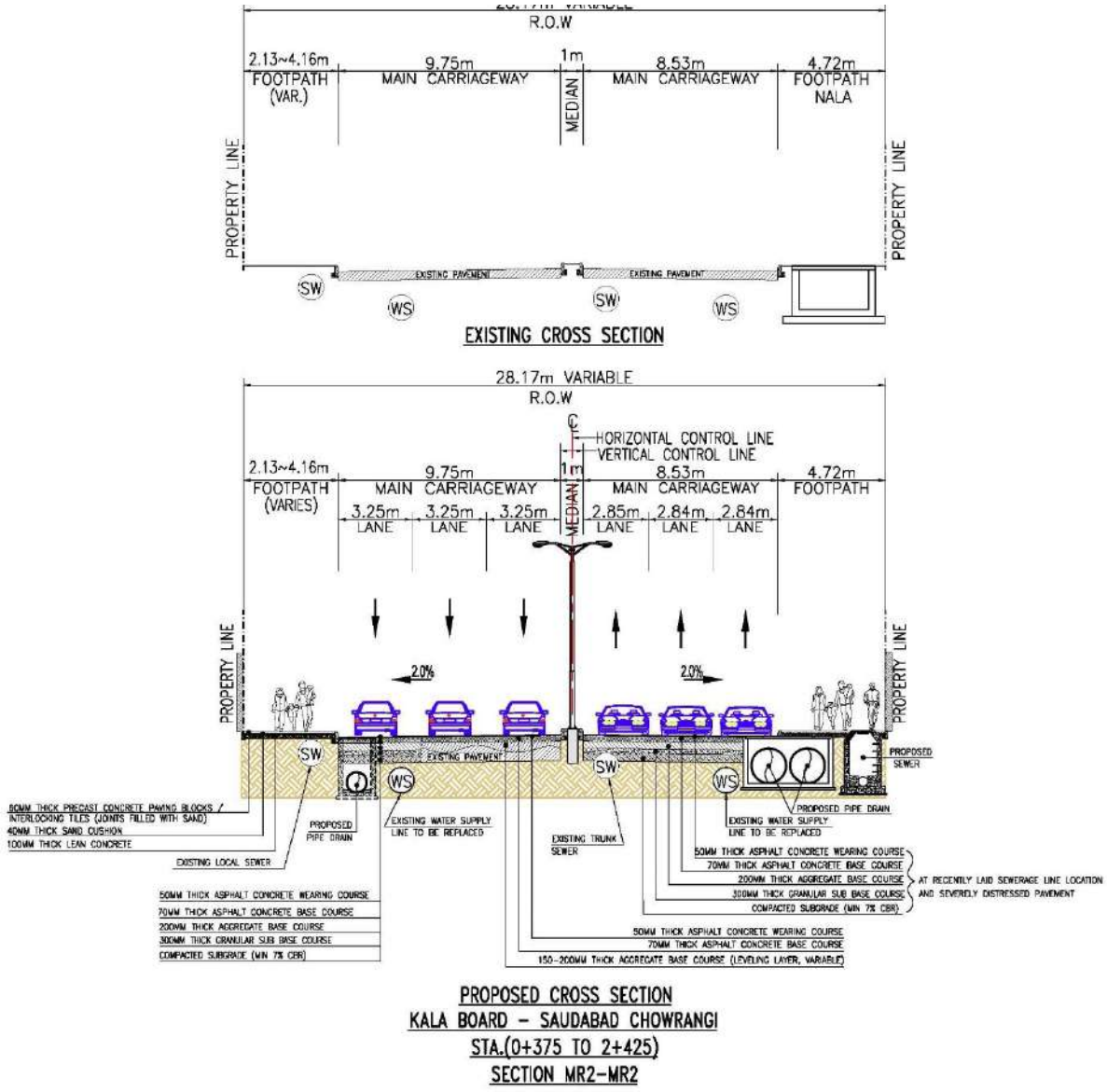


Figure 2-2 Existing and Proposed Cross Section of Kala Board to Saudabad Chowrangi (0+375 to 2+425 km)

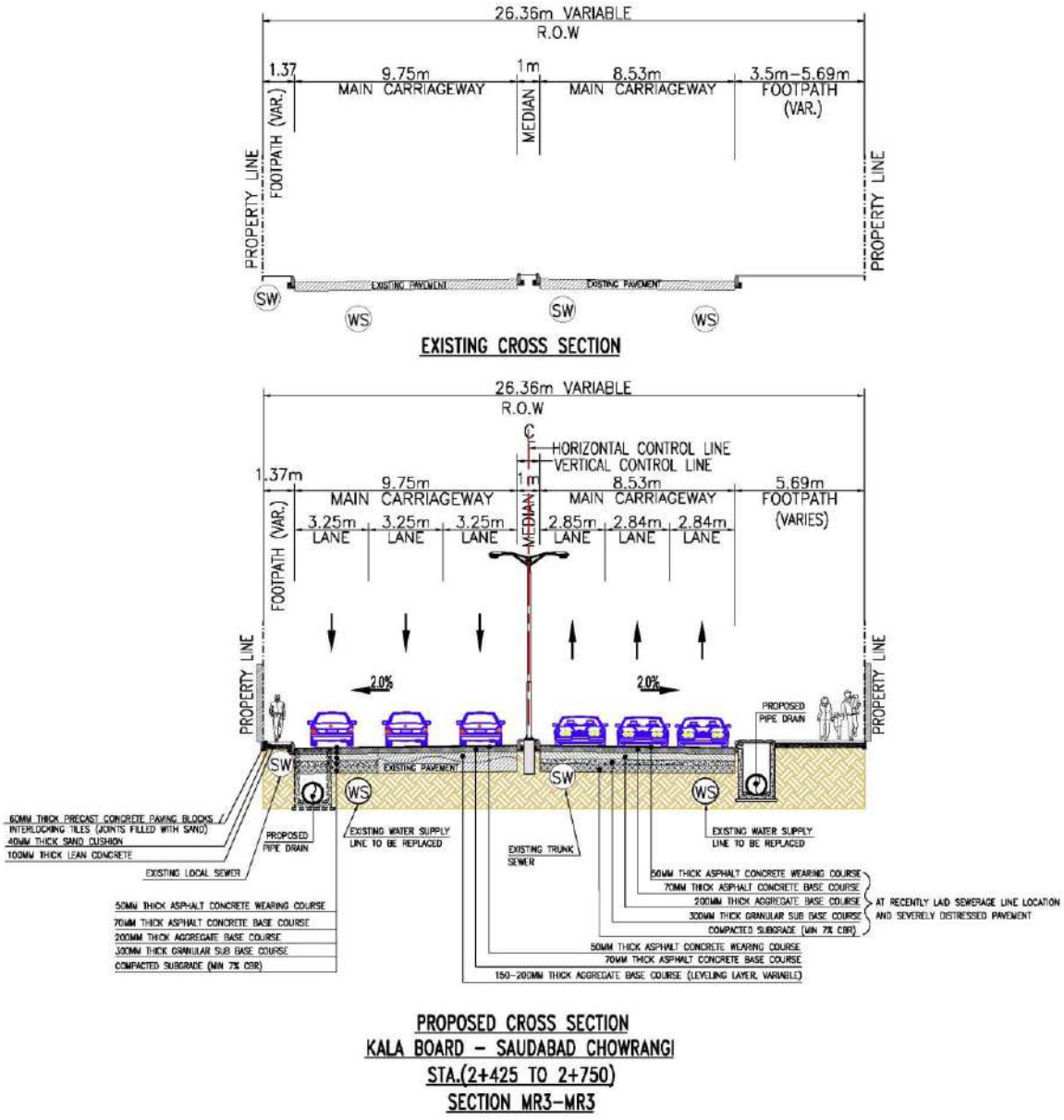


Figure 2-3 Existing and Proposed Cross Section of Kala Board to Saudabad Chowrangi (2+425 to 2+750 km)

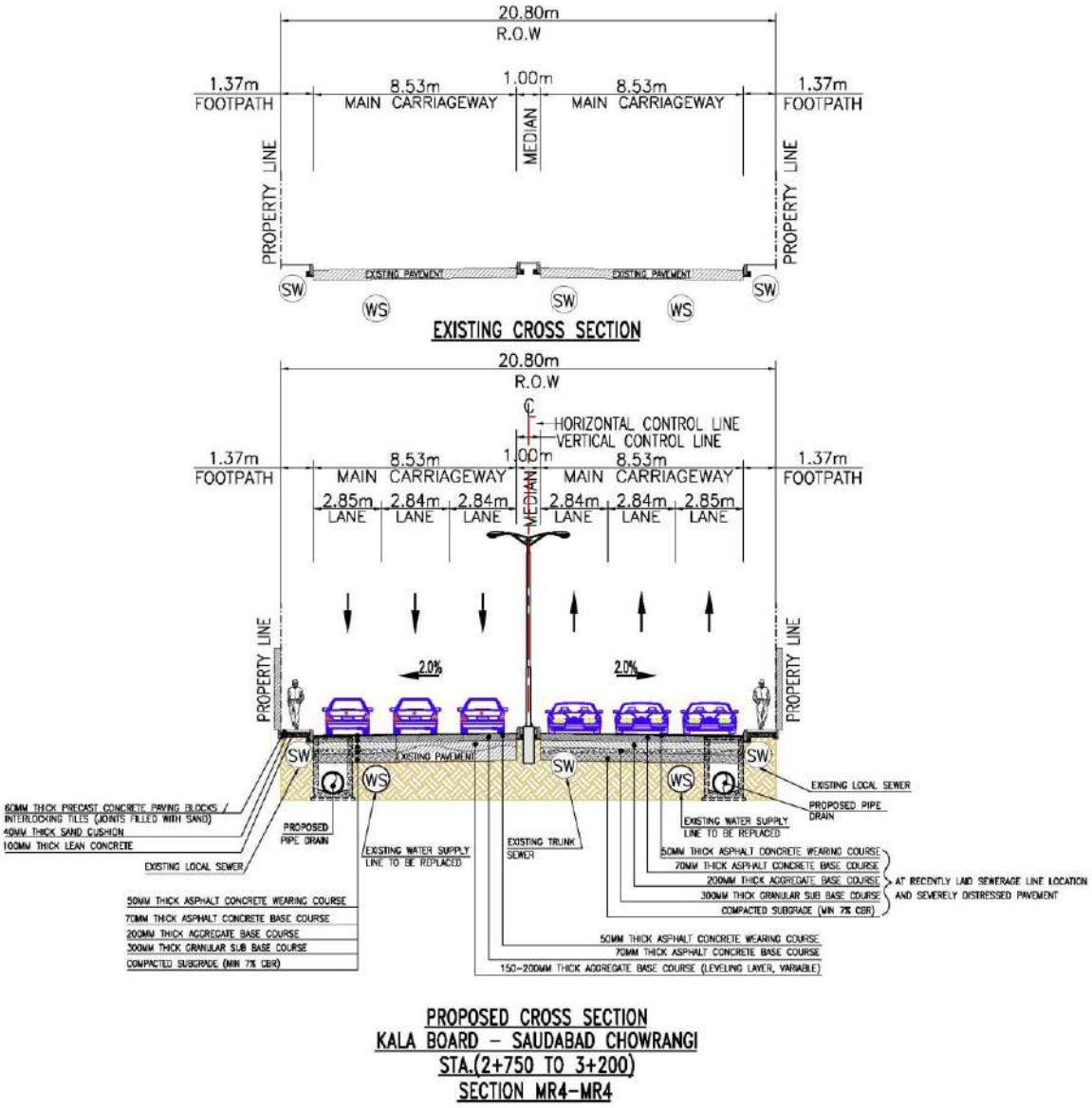


Figure 2-4 Existing and Proposed Cross Section of Kala Board to Saudabad Chowrangi (2+750 to 3+200 km)

2.2 RCD Football Ground

2.2.1 Proposed Design:

The existing RCD ground, over an area of 55,400 sq ft, has been planned with small football ground of 138x 82 ft, children play area and jogging track. The proposed children play area is grassy with variety of trees and benches to enhance the environment. The proposed plans and views of the RCD ground are shown in Figure 2-5 to Figure 2-8.

Figure 2-5 Design Proposal for RCD Ground (Plan View 1)

Figure 2-6 Design Proposal for RCD Ground (Plan View 2)

Figure 2-7 Children Play Area in RCD Ground (View 1)

Figure 2-8: Children Play Area in RCD Ground (View 2)

2.3 SAUDABAD CHOWRANGI TO URDU CHOWK (0.3 KM)

2.3.1 Proposed Cross section

The initial potion of the road is dual carriageway near Saudabad Chowrangi, however, the road section under this sub-project is single carriageway with variable lanes width as per available

space. Storm water pipe drain will be provided on one side to cater the road surface water with one sided cross slope. Existing footpaths on either side will be rehabilitated and renovated with new planters / trees and sitting areas with benches for local community. Traffic signs and road markings will be provided for facilitation of road users including vehicles and pedestrians.

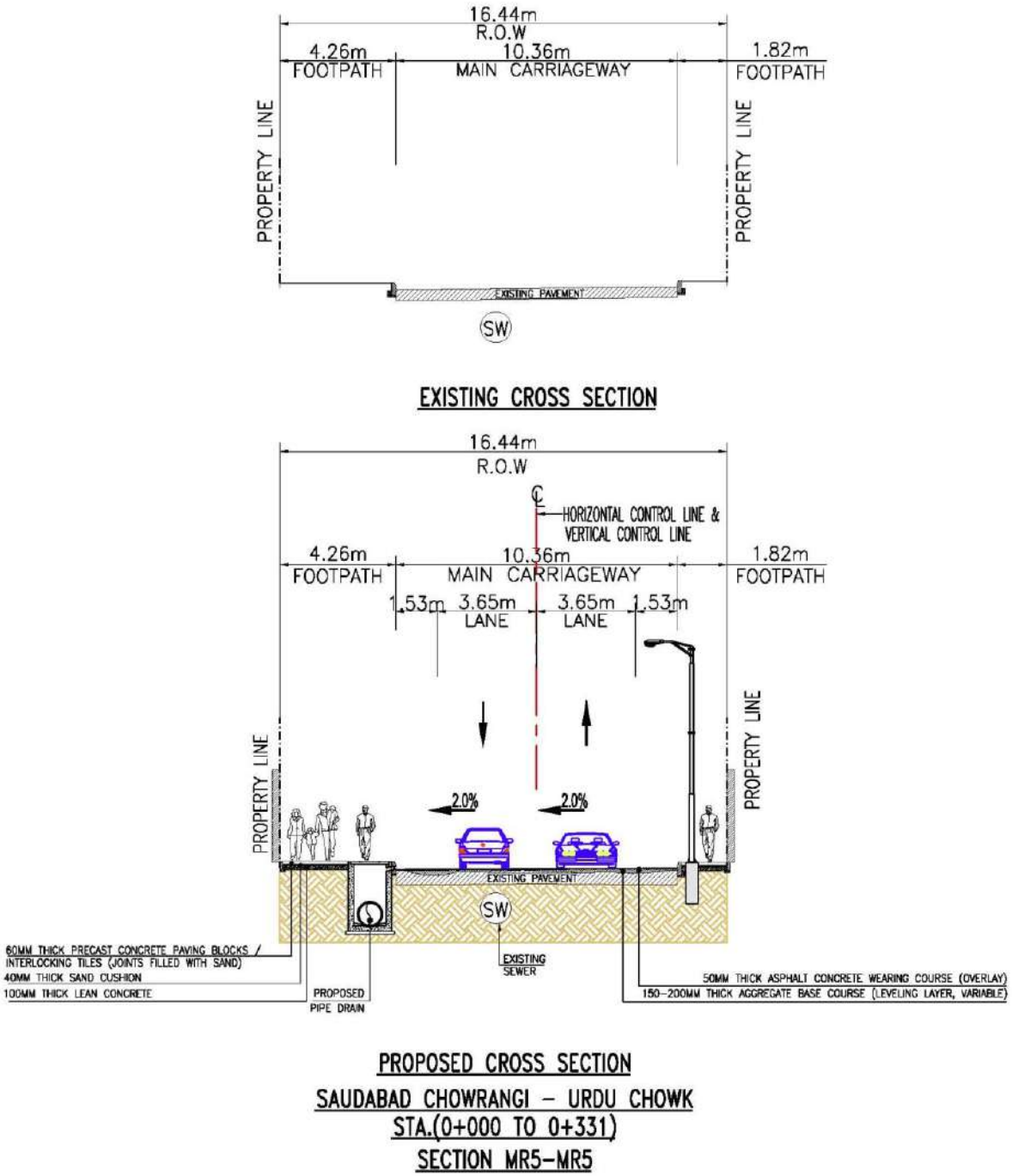


Figure 2-9 Existing and Proposed Cross Section of Saudabad Chowrangi to Urdu Chowk (0+000 to 0+331 km)

The road segment will be rehabilitated as per road condition survey. Where storm water pipe is being laid reconstruction of road will be required. The existing and proposed cross section are shown in Figure 2-9.

2.4 SAUDABAD CHOWRANGI TO JINNAH SQUARE CHOWRANGI - NADE ALI ROAD (1.2 KM)

2.4.1 Proposed Cross section

The dual carriageway with 2+2 lane on either side with 3.65m lane width as per available space will be reconstructed based on road condition survey. Existing 0.76m wide median will be increased to 1.8m to 6.91m with renovated / new electric poles with LED Lights and trees plantation as per site requirements. Separate storm water pipe drain under carriageway will be provided on both sides to cater the road surface water. Proposed footpaths on either side with variable width from 1.8m to 3.74m will be rehabilitated and renovated with new planters / trees and sitting areas with benches for local community. Near sport stadium parking has been proposed. Traffic signs and road markings will be provided for facilitation of road users including vehicles and pedestrians.

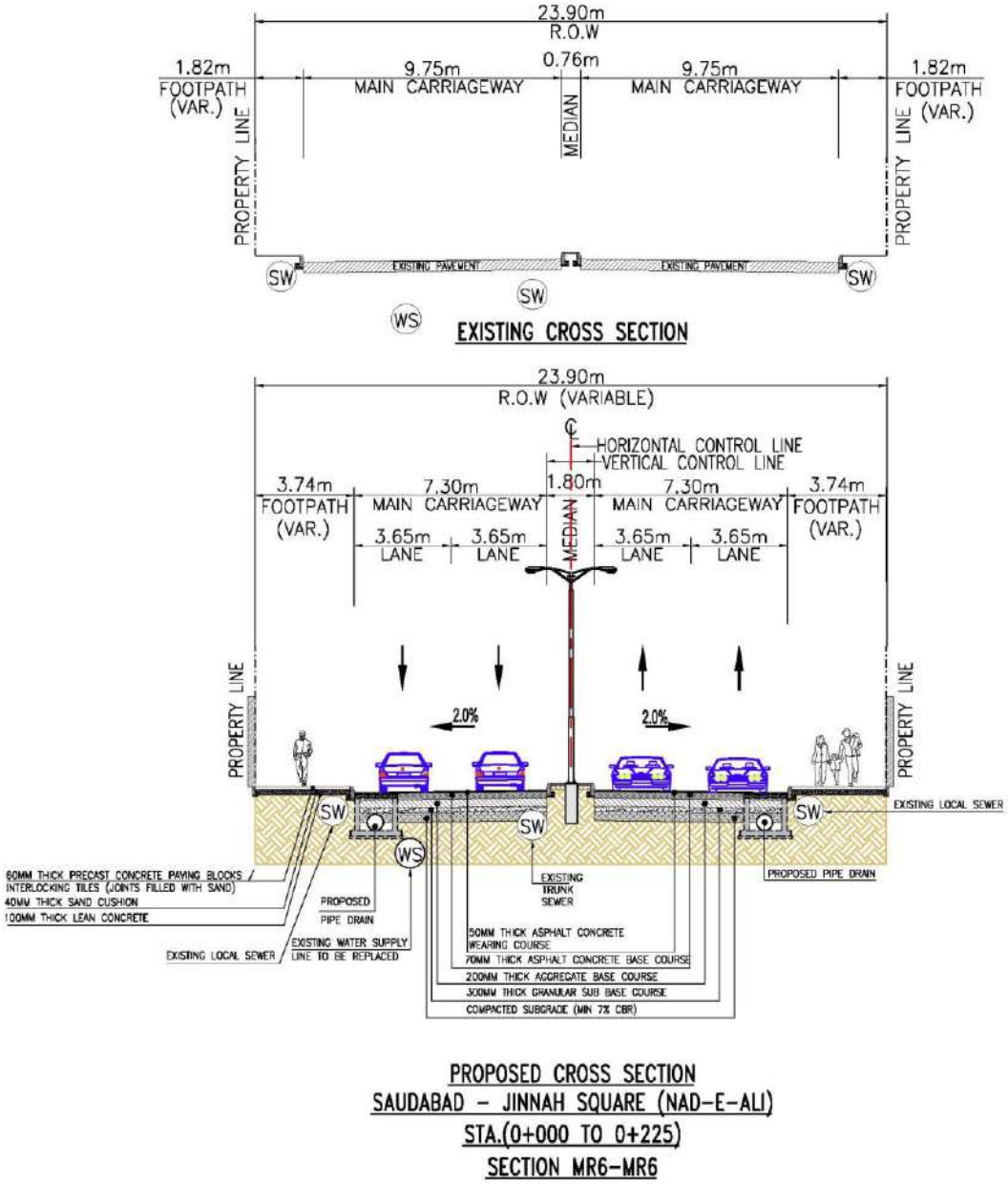


Figure 2-10 Existing and Proposed Cross Section of Saudabad Chowrangi to Jinnah Square (0+000 to 0+225 km)

Both the carriageways will be reconstructed considering the existing deteriorated condition as per road condition survey. Besides the road structure is in very distressed condition at various location due to leakage of existing sewer and water supply lines. The existing and proposed cross sections applicable to various chainages are depicted in Figure 2-10 to Figure 2-12.

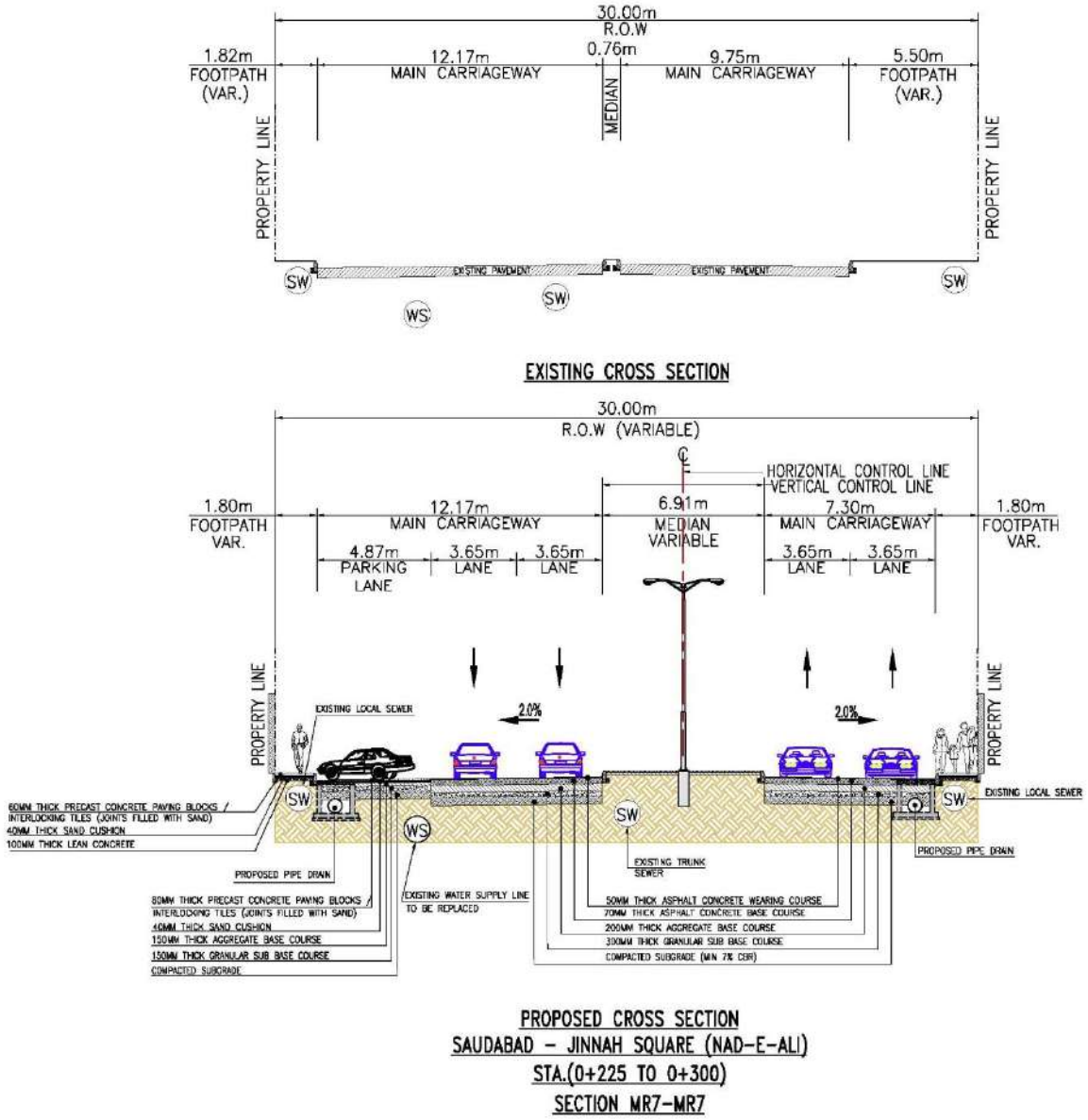


Figure 2-11 Existing and Proposed Cross Section of Saudabad Chowrangi to Jinnah Square (0+225 to 0+300 km)

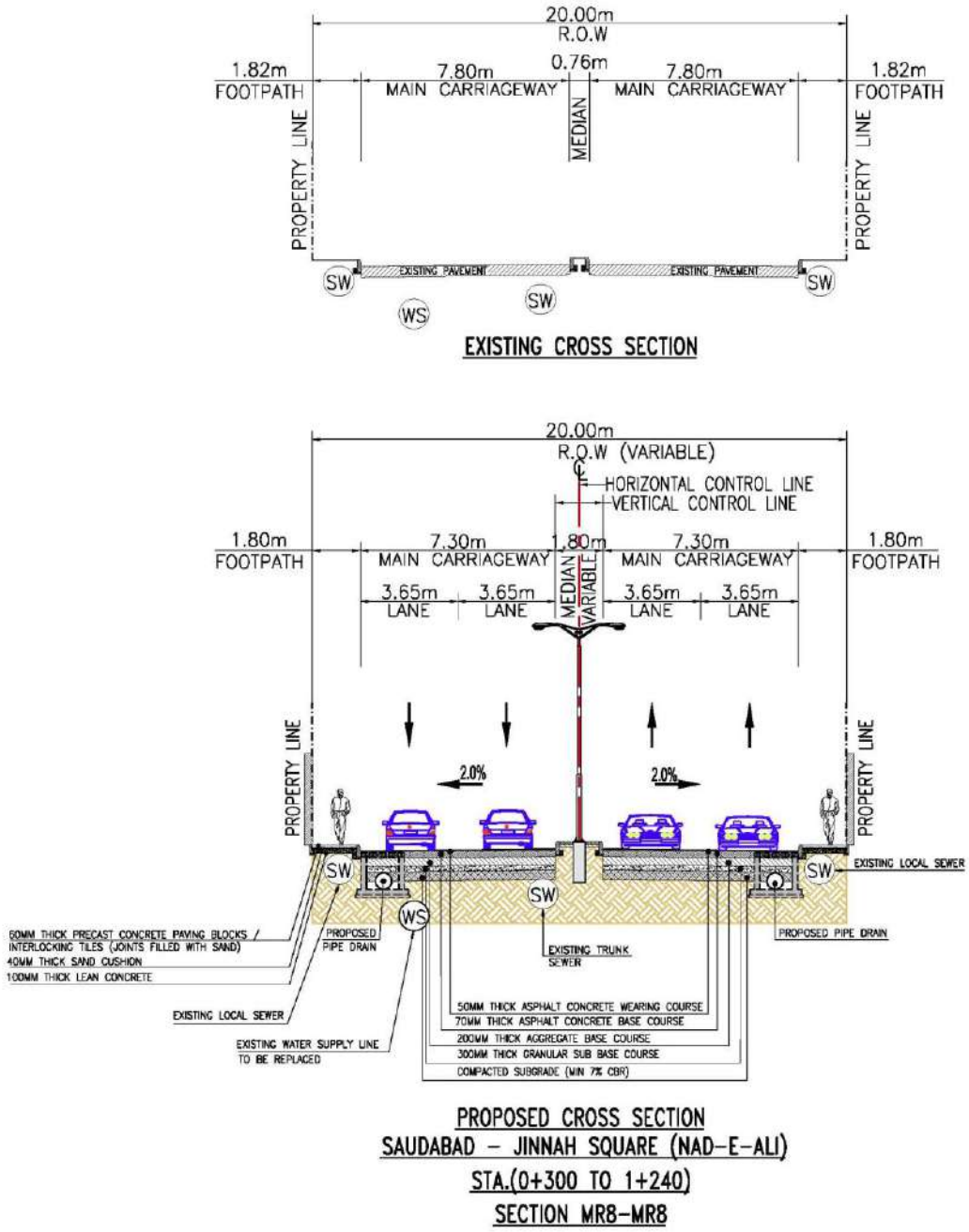


Figure 2-12 Existing and Proposed Cross Section of Saudabad Chowrangi to Jinnah Square (0+300 to 1+240 km)

2.5 SOOMAR KANDANI TO MURAD MEMON CHOWK ROAD (1.5 KM) OF MALIR DISTRICT.

2.5.1 Proposed Cross section

The existing single carriageway is being upgraded to dual carriageway with 2+2 lane on either side with 3.00m lane width as per available space. 0.5m wide physical separation between two carriageways with back-to-back curb blocks will be provided for installation of new electric poles with LED Lights. Separate storm water pipe drain under carriageway will be provided on both sides to cater the road surface water. Proposed footpaths on either side with 2.00m will be reconstructed with planters / trees and sitting areas with benches for local community. Traffic signs and road markings will be provided for facilitation of road users including vehicles and pedestrians.

The existing carriageway will be rehabilitated. In widening areas and where storm water pipe is being laid new construction of road will be required. The existing and proposed cross sections applicable to various chainages are depicted in Figure 2-13.

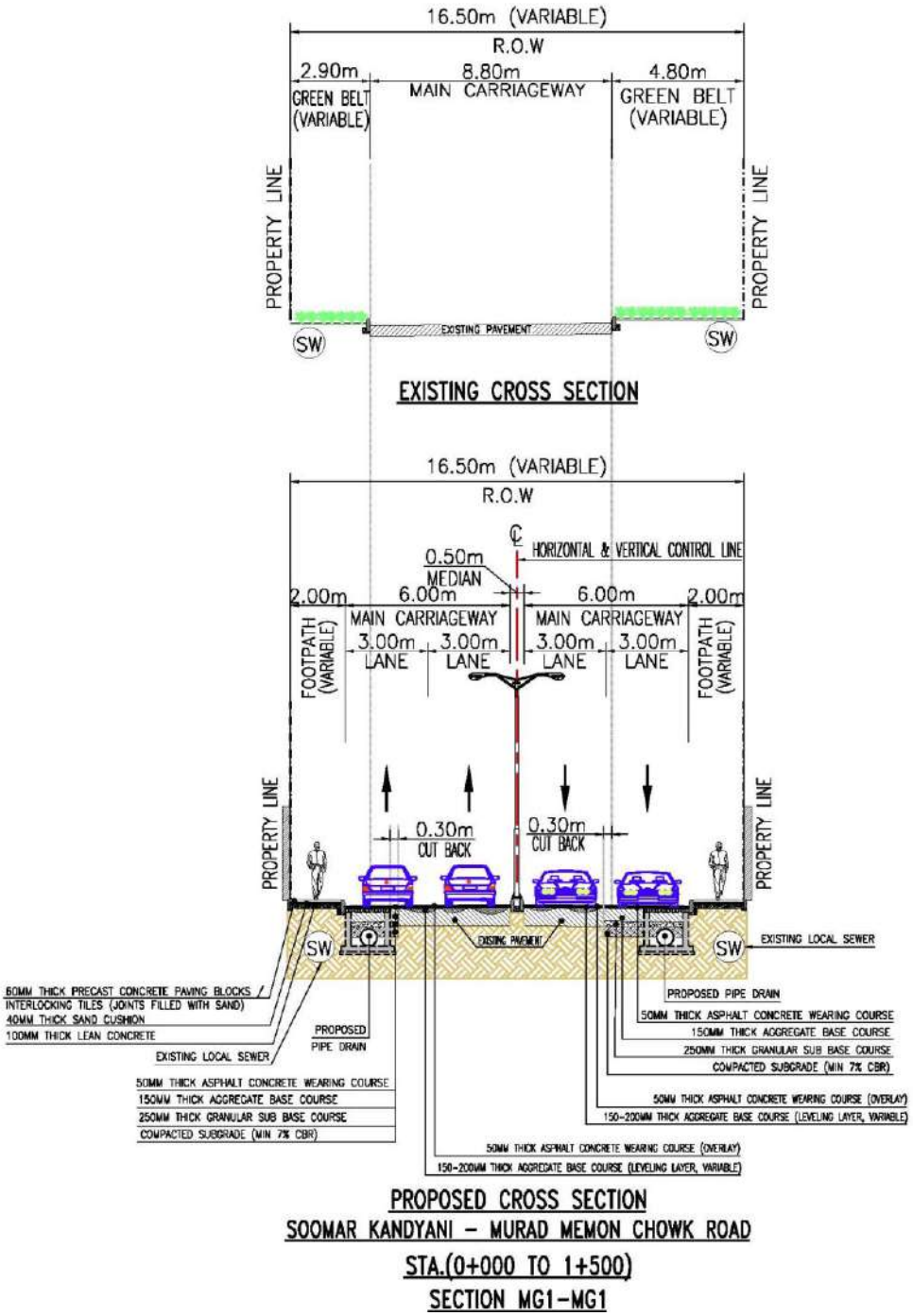


Figure 2-13 Existing and Proposed Cross Section of Soomar Kandani to Murad Memon Chowk (0+000 to 1+500 km)

Chapter 3. ENVIRONMENTAL AND SOCIAL MANAGEMENT REQUIREMENT

This section provides detailed review of policies, legislation, and guidelines that will have relevance to the proposed Sub-projects and review of administrative framework as well as institutional set-up relevant to the environmental and social management of the proposed sub-projects.

3.1 NATIONAL LAWS AND REGULATIONS

Pakistan's statute books contain several laws related to the regulation and control of the environmental and social aspects. However, the enactment of comprehensive legislation on the environment, in the form of an act of parliament, is a relatively new practice. Most of the existing laws on environmental and social issues have been enforced over an extended period of time and are context-specific. After the Eighteenth amendment in the Constitution of Pakistan, many federal subjects devolved to provincial legislation. The Concurrent List in fourth schedule of the Constitution containing entries of subjects wherein federal and provincial legislation could legislate has been abolished. Since project coverage is in province of Sindh; therefore, only those national laws and regulations are discussed here which have application in the sub-project. There are still several federal laws which have not been repealed by the provinces and applicable in provinces with its original titles. The laws relevant to the proposed subproject are briefly reviewed below.

3.1.1 National Environmental Policy, 2005

The National Environmental Policy, 2005 aims to protect, conserve and restore Pakistan's environment in order to improve the quality of life for the citizens through sustainable development. It provides an overarching framework for addressing the environmental issues facing Pakistan, particularly pollution of freshwater bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification, natural disasters and climate change. It also gives direction for addressing the cross sectorial issues as well as the underlying causes of environmental degradation and meeting international obligations.

The National Environmental Policy, 2005 while recognizing the goals and objectives of the National Conservation Strategy, National Environmental Action Plan and other existing environment related national policies, strategies and action plans, provide broad guidelines to the Federal Government, Provincial Governments, Federally Administrated Territories and Local Governments for addressing environmental concerns and ensuring effective management of their environmental resources.

3.1.2 National Sanitation Policy, 2006

The national Sanitation Policy, 2006 devised to provide a broad framework and policy guidelines for all level of governments to enhance and support sanitation coverage in the country.

The primary focus of the policy is on the safe disposal of excreta away from the dwelling units and workplaces by using a sanitary latrine and includes creation of an Open Defecation Free

environment along with the safe disposal of liquid and solid wastes, and the promotion of health and hygiene policy in the country.

3.1.3 Land Acquisition Act, 1894

This Act is a colonial legacy which provides law for the acquisition of land needed for public purposes. The Act provides complete mechanism for determining the amount of compensation for land, trees, horticulture, to be made on account of such acquisitions. The law provides details of various peculiarities involved in acquisition of land such as preliminary investigation, objection to acquisition, declaration of intended acquisition, enquiry into measurements, value & claims, taking possession, reference to court and procedure thereon, apportionment of compensation, payment, temporary occupation of land, acquisition of land for companies, disputes resolutions, penalties and exemptions, etc. This Act has 55 sections addressing different areas. Section 4(2) of the Act mentions that it shall be lawful for any official authorized by the Collector to enter upon and survey, to dig or to do all other acts necessary to ascertain whether the land is suitable for such purpose.

The LAA and its implementation rules require that impacts assessment/valuation effort, land and crops are compensated in cash at market rate to titled landowners and registered land tenants/users, respectively.

Based on the LAA, only legal owners/title holders and tenants registered with Land Revenue Department or possessing formal lease agreements, are eligible for compensation or livelihood support. However, other national projects, have been awarded compensation and assistance, in good faith, to non-title holders and other forms of PAPs (squatters /encroachers) based on their own resettlement policies.

The components under sub-projects will be undertaken on government land and existing ROW of sub-projects roads (as screened in section 6.2). According to the results of detailed social survey, there are no PAPs found in sub-projects area where the sub-projects interventions are proposed. There are no encroachers / squatters living or doing businesses in the sub-projects area. Also, the parking requirements during construction will be fulfilled while using existing roads in sub-projects area. There will be no land acquisition required for the proposed interventions.

3.1.4 Labor Laws

3.1.4.1 Employment of Child Act, 1991

Article 11(3) of the Constitution of Pakistan prohibits employment of children below the age of 14 years in any factory, mines or any other hazardous employment. In accordance with this Article, the Employment of Child Act (ECA) 1991 disallows child labor in the country. The ECA defines a child to mean a person who has not completed his/her fourteenth years of age. The ECA states that no child shall be employed or permitted to work in any of the occupation set forth in the ECA (such as transport sector, railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act is carried out.

Sub-projects contractor(s) will be bound by the ECA to not allow any child labor or bonded labor at the Sub-projects site.

3.1.4.2 The Bonded Labor System (Abolition) Act, 1992

Article 11(2) of the Constitution of the Islamic Republic of Pakistan prohibits all forms of forced labor. In accordance with this Article, The Bonded Labor System (Abolition) Act, 1992 provides for the abolition of bonded labor system in the country. Under section 4(2) of this Act, No person shall make any advance under, or in pursuance of, the bonded labor system or compel any person to render any bonded labor or other form of forced labor. The practice of bonded labor has become a punishable offence after enactment of this act (with imprisonment for a term which shall not be less than two years nor more than five years, or with fine which shall not be less than fifty thousand rupees, or with both). Vigilance Committees are formed at the district level to keep an eye on the working of law and help in rehabilitation of freed bonded labor.

Sub-projects contractor(s) will be bound by the Act to compel its labor and the provisions of this Act will be ensured.

3.1.4.3 Workmen's Compensation Act, 1923

Workmen's Compensation Act, 1923 provides for the compensation to be paid by employer to workers or their legal heirs in case of death, permanent total disablement, permanent partial disablement and temporary disablement during working.

The Sub-projects contractor(s) is liable to pay compensation in case of any accidents and PIU will ensure the compensation as per this Act.

3.1.4.4 Minimum Wages Ordinance, 1961

Section 9 (1) of this ordinance states that no employer shall pay any worker wages at a rate lower than the rate declared under this Ordinance to be the minimum rate of wages for such worker. 9 (2) any employer who contravenes the provisions of this section shall be punishable with imprisonment for a term which may extend to six months or with fine.

The Emergency Sub-Projects contractor(s) is liable to pay at least minim wages to his/her unskilled labor and PIU will ensure payment of not less than the minimum wage as specified above.

3.1.4.5 The Industrial and Commercial Employment (Standing Orders) Ordinance, 1968

The ordinance which applies to construction industry and contractor, does not specify the hours of working in one shift however, standing orders under this act state that the periods and hours of work for all classes of workmen in each shift shall be exhibited in Urdu and in the principal language of workmen employed, in the industrial or commercial establishment on notice boards maintained at or near the main entrance of the establishment and at the time-keeper's office, if any.

The Factories Act, 1934 (Section-34), Mines Act, 1923 (Section 22-B, C), Shops and Establishment Ordinance, 1969 (Section 8) and Road Transport Ordinance, 1961 (Section-4) are used to determine working hours and rest time in different industries which are not applicable for construction works conducted by Contractor. Section 34 of the Factories Act provides that "no adult worker shall be allowed or required) to work in a factory for more than 48 hours in a week; if the factory is seasonal, 50 hours a week and if the work is of continuous nature, he may work for 56 hours in a week. As for the daily hours, these may not be more than 9 hours a day (in case

of seasonal; 10 hours). Any adult worker is required to work overtime, if asked, and the rate of overtime payment is double the usual pay (Section 47). Overtime is not payable to the contract workers, employed on piece rate basis.

3.1.4.6 The Protection against Harassment of Women at the Workplace Act 2010

The Act was promulgated on March 11, 2010 to make provisions for the protection against harassment of women at the workplace. It states that each organization shall constitute an Inquiry Committee within thirty days of the enactment of this Act to enquire into complaints under this Act. The Inquiry Committee shall hold an inquiry against the charges and statement of allegations within three days of receipt of a written complaint. The Inquiry Committee if found the accused to be guilty, shall pose the penalties described in the Act.

The Grievance Redressal Mechanism as described in this ESMP will cater protection against women harassment at workplace based on the provisions of this Act.

A Code of Conduct at the Workplace will be developed by CC to provide protection and safety to women against harassment and will be followed during the whole construction period.

3.1.4.7 ILO Conventions - Ratifications for Pakistan

Pakistan has ratified 08 fundamental and 26 technical ILO conventions in which following are relevant to the project:

C029 - Forced Labor Convention, 1930 (No. 29)

C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111)

C138 - Minimum Age Convention, 1973 (No. 138)

C001 - Hours of Work (Industry) Convention, 1919 (No. 1)

C029 - FORCED LABOR CONVENTION, 1930 (NO. 29)

Article 1 of the convention states each member undertakes to suppress the use of forced or compulsory labor in all its' forms within the shortest possible period. Article 2 of the convention states that the term forced, or compulsory labor shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.

C111 - DISCRIMINATION (EMPLOYMENT AND OCCUPATION) CONVENTION, 1958 (NO. 111)

For the purpose of this Convention, discrimination includes any distinction, exclusion or preference made on the basis of race, color, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation.

C138 - MINIMUM AGE CONVENTION, 1973 (NO. 138)

Article 1 of the convention states that Each Member which ratifies this Convention shall specify, in a declaration appended to its ratification, a minimum age for admission to employment or work within its territory and on means of transport registered in its territory; subject to Articles 4 to 8 of this Convention, no one under that age shall be admitted to employment or work in any occupation.

C001 - HOURS OF WORK (INDUSTRY) CONVENTION, 1919 (NO. 1)

The term industrial undertaking under this convention includes (c) construction, **reconstruction, maintenance, repair,** alteration, or demolition of any building, railway, tramway, harbor, dock, pier, canal, inland waterway, road, tunnel, bridge, viaduct, sewer, drain, well, telegraphic or telephonic installation, electrical undertaking, gas work, waterworks or other work of construction, as well as the preparation for or laying the foundations of any such work or structure.

Article 2 of the Convention states that the working hours of persons employed in any public or private industrial undertaking or in any branch thereof, other than an undertaking in which only members of the same family are employed, shall not exceed eight in the day and forty-eight in the week. The limit of hours of work prescribed in Article 2 may be exceeded in case of accident, actual or threatened, or in case of urgent work to be done to machinery or plant, or in case of "force majeure", but only so far as may be necessary to avoid serious interference with the ordinary working of the undertaking.

3.2 PROVINCIAL LAWS AND REGULATIONS

3.2.1 Sindh Environmental Protection Act, 2014

Legislative assembly of Sindh Province of Pakistan passed the bill on 24th February 2014 to enact Sindh Environmental Protection Act 2014. The Act envisages protection, improvement, conservation and rehabilitation of environment of Sindh with the help of legal action against polluters and green awakening of communities. It equally lays emphasis for the preservation of the natural resources of Sindh and to adopt ways and means for restoring the balance in its eco-system by avoiding all types of environmental hazards. This act has also provided for Sindh Sustainable Fund derived from various sources such as voluntary contributions or fees generated etc. This fund is utilized for protection, conservation or improvement of environment.

3.2.2 Sindh Solid Waste Management Board Act, 2014

The Sindh Solid Waste Management Board (SSWMB) Act, 2014 enacted to establish a board for collection and disposal of all solid waste, to arrange effective delivery of sanitation services, to provide pollution free environment and to deal with other relevant matters. The Board established under the Act headed by the Chief Minister or his nominee and constitutes of thirteen other ex officio members of other relevant departments. SSWMB is managing the waste in subproject area.

3.2.3 Sindh Environmental Quality Standards (SEQS)

With the SEPA Act, 2014 the Sindh EPA revised the Environmental Quality Standards (EQS) with full consultation of the private sector, industrialist, trade and business associations and NGOs and approval of Sindh Environmental Protection Council has developed Sindh Environmental Industrial Wastewater, Effluent, Domestic Sewerage, Industrial Air Emission, Ambient Air, Noise for vehicles, Air Emissions for Vehicles and Drinking Water Quality Standards 2015 vide Notification No.EPA/TECH/739/2014. Only a few of these standards will be applicable to the noise and liquid effluents discharged to the environment from the activities under the proposed sub-project. The SEQS is presented in **Annex A**. Subproject Contractor(s) is liable to follow the SEQS in letter and spirit.

3.2.4 Sindh Cultural Heritage (Preservation) Act, 1994[1]

Sindh Cultural Heritage (Preservation) Act of 1994 was passed by the Provincial Assembly in February 1994 and was enacted in April 1994. This act aims to preserve and protect ancient places and objects of architectural, historical, archaeological, artistic, ethnological anthropological and national interest in the Province of Sindh.[2]

The act enables the Government to declare any premise or object of architectural, historical, archaeological or national value, after consultation with the Advisory Committee. The act also states that if it is apprehended that any person intends to destroy, remove, alter, deface or imperil the protected heritage or to build on or near the site thereof in contravention of the terms of an agreement for its preservation under section 8 of the act, the Committee may issue an order prohibiting any such contravention.

Under this Act government has constituted an advisory committee constitute of a Chairman and six other members may be appointed by Government.

The act prohibits any person who intends to destroy, remove, alter, deface or imperil the protected heritage or to build on or near the site thereof in contravention of the terms of an agreement for its preservation under section 8, the Committee may an order prohibiting any such contravention.

The act enables the Government if apprehends that a protected heritage is in danger of being destroyed, injured or allowed to fall into decay, Government may Acquire it under the provision of the Land Acquisition Act, 1894, as if the preservation of a protected heritage were a “public purpose” within the meaning of that Act. The Committee is responsible to maintain and preserve every protected heritage in respect of which Government has acquired any of the rights mentioned in section 7 or which the Government has acquired under section 12 of the act.

The act also mentions that if any person including the owner destroys, removes, injures, alters, defaces a protected heritage maintained by Government under this act or in respect of which an agreement has been executed under section 8 of the act, shall be punishable with fine which may extend to one lakh rupees, or with imprisonment which may extend to three years, or with both. There is no restriction of distance from construction activity to a PCR protected under this Act.

3.2.5 Sindh Local Government Act, 2013[3]

Sindh Local Government Act was passed in 2013 and extends to the whole of Sindh Province. It aims to establish an elected local government system to devolve political, administrative and financial responsibility and authority to the elected representatives of the local governments; to promote good governance, effective delivery of services and transparent decision making through institutionalized participation of the people at local level; and, to deal with ancillary matters. It deals with the matters such as Constitution and Composition of Councils, Local Government

[1] Sindh Cultural Heritage (Preservation) Act, 1994 – Gazette of Sindh (April, 1994)

[3] The Sindh Local Government Act, 2013. Sindh Act NO. XLII OF 2013. (Sep, 2013)

Elections, Functions of the Councils, Local Taxation, Local Fund and Property, Administration of Service and Transitional Provisions. In the nutshell, the local governments are administered by this act which defines their composition, functions, scope and other related matters.

Metropolitan governance in Karachi is framed by the Sindh Local Government Act 2013 (SLGA 2013), with a metropolitan entity for the entire city area and district-level municipal entities under it. Newly elected local governments (LG) for Karachi came into office in August 2016 after a gap of six years. LGs in Karachi include the Karachi Metropolitan Corporation (KMC – headed by elected Mayor and Deputy Mayor) at the metropolitan level and seven District Municipal Corporations (DMCs – headed by elected Chairmen and Vice Chairmen) at the District level. These LGs collectively provide municipal functions in the urban and rural areas of Karachi Division (an administrative unit consisting of seven districts[4]) with municipal functions divided between KMC and DMCs. There is no formal coordination or relationship between KMC and DMCs, creating another layer in city governance. Government of Sindh (GoS) retains substantial control which limits the autonomy of these LGs, and a number of powers are available to GoS to oversee and regulate the functioning of LGs. GoS has also in the recent past taken over a number of key municipal/ urban functions and removed them from the mandate of LGs. As the province and the city governments are being run by rival political parties, this asymmetrical balance of power is adversely impacting delivery of services and contributing to a lack of vertical integration between various tiers of city governance.

3.2.6 Sindh Occupational Safety and Health Act 2017

The Sindh Occupational Safety and Health Act, 2017 (Sindh Act No. I Of 2018) was passed to make provision for occupational safety and health conditions at all workplaces for the protection of persons at work against risk of injury arising out of the activities at work places and for the promotion of safe, healthy and decent working environment adapted to the physical, physiological and psychological needs of all persons at work. It is expedient to make provision for occupational safety health conditions at all workplace for the protection of persons at work against risk of injury arising out of the activities at work places and for the promotion of safe, healthy and decent working environment adapted to the physical, physiological and psychological needs of all persons at work and to provide for all matters connected therewith or ancillary.

3.2.7 Sindh Occupational Safety and Health Act 2019

Sindh Occupational Safety and Health Rules, 2019 provides general duties of employer, self-employed, employer to the persons other than their workers, workers and volunteer etc. to enforce the regulations, standards, guidelines and code of practices related to occupational safety and health. It also provides guidelines related to safety and health covered under Section 10 of Sindh

[4] Karachi Division is an administrative unit comprising seven districts of Karachi, namely: East, West, South, Central, Korangi, Kemari and Malir There is one DMC for each of these seven districts. Rural areas of the Division, which lie in the periphery of the city, fall under a separate LG, the District Council, with its own elected council and chairperson. From 2001 to 2010, under a previous LG law, the entire Karachi Division was consolidated as the City District Government Karachi and was run by a single elected Nazim (mayor).

Occupational Safety and Health Act 2017. This Rule exhibits sample forms for certification, reporting and monitoring.

3.2.8 Sindh minimum wages Act 2015

This act was promulgated to provide for the regulation of minimum rates of wages and various allowances for different categories of workers employed in certain industrial and commercial undertakings and establishments. It is expedient to provide for regulation of minimum rates of wages and various allowances for different categories of workers employed in certain industrial and commercial undertakings and establishments and for matters connected therewith and ancillary. The increase in the minimum wage rate to Rs.25000 per month for next financial year 2021-22 by Government of Sindh was announced on July 9, 2021.

3.2.9 Sindh Forest Act, 2012

The sub-project will be executed in accordance with the Forest Act, 2012 and no unauthorized tree cutting will be allowed to be cut by worker or labor. However, plantation component is already included as a key intervention for provision of environment friendly urban spaces in the sub-project area.

3.3 THE WORLD BANK OPERATIONAL POLICIES

The application of World Bank Operational Policies is described below in Table 3.1.

Table 3-1: World Bank Safeguard Policies Triggered

S#	Environmental Assessment	Policy Reference	Applicable	Not Applicable	Remarks
1.	Environmental Assessment	OP/BP 4.01	✓		This Subproject is classified as "Category B" project per the WB Environment Category since the activities under the sub-projects would be small-scale interventions in terms of rehabilitation, restoration, maintenance on the existing footprints to improve livability.
2.	Natural Habitat	OP/BP 4.04		✓	This OP is not triggered as the sub-projects interventions will not impact any natural habitat.
3.	Pest Management	OP 4.09		✓	This policy is not triggered since the sub-projects interventions do not involve the use pesticide / pest management.
4.	Indigenous People	OP/BP 4.10		✓	There are no known indigenous people as defined by OP 4.10 in Karachi District.

S#	Environmental Assessment	Policy Reference	Applicable	Not Applicable	Remarks
5.	Physical Cultural Resources	OP/BP 4.11		✓	The emergency sub-projects involves rehabilitation of roads and utility works at the existing roads, and development of parks. There are no buildings declared as "Protected Heritage" by the Government of Sindh (Under the Sindh Cultural Heritage (Preservation) Act 1994 on September 7, 1995)) in the Emergency Sub-project area.
6.	Involuntary Resettlement	OP/BP 4.12		✓	The sub-projects will be undertaken on government land and existing ROW of sub-projects roads. According to a detailed social survey conducted by ESMP Consultant, there are no residents or businesses found in the sub-projects area. The interventions will also not have a temporary impact on livelihoods. Therefore, there are no PAPs as per OP 4.12 were found in sub-projects area where the subproject interventions are proposed. Also, the parking requirements during construction will be fulfilled while using existing roads in sub-project area. While OP 4.12 has been triggered in the project ESMF, no involuntary resettlement will occur for the proposed sub-projects.
7.	Forestry	OP 4.36		✓	This OP is not triggered since the sub-projects is not located in the forest areas.
8.	Safety of Dams	OP 4.37		✓	This OP is not relevant since the sub-projects does not involve construction of dams.
9.	Projects on International Waterways	OP/BP 7.50		✓	This OP is not triggered as the subproject interventions (involving rehabilitation and improvement of sewerage and storm water drainage systems in the subproject area) do

S#	Environmental Assessment	Policy Reference	Applicable	Not Applicable	Remarks
					not pollute the tributaries of Indus River System which as per Indus Water Treaty is designated as International Waterway between India and Pakistan.

3.3.1 Environmental Assessment (OP 4.01)

The World Bank requires Environmental and Social Assessment (ESA) of projects proposed for Bank financing to help ensure that they are environmentally and socially sound and sustainable, and thus to improve decision-making that is environment-friendly. The OP defines the EA process and various types of the EA instruments. The proposed sub-projects may consist of activities which can potentially have negative environmental and social impacts; hence the Policy is triggered and ESMP has been developed. The activities under the sub-projects would consist of rehabilitation, restoration, maintenance of the existing infrastructure and public spaces to improve people's livability, the level of environmental impacts is likely to be low to moderate. This project is classified as "Category B" project per the WB Environment Category since no irreversible, long-term and significant adverse impacts are foreseen to take place as a result of its implementation.

The OP 4.01 also defines ESMF as "An instrument that examines the issues and impacts associated when a project consists of a series of sub-projects, and the impacts cannot be determined until the sub-projects details have been identified. The ESMF sets out the principles, rules, guidelines and procedures to assess the environmental and social impacts. It contains measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts, provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project impacts. The term "Environmental Management Framework" or "EMF" may also be used."

The sub-project intends to finance a variety of types of interventions (*e.g.,* The sub-project involves rehabilitation of existing roads and utility works; improved paving for sidewalks, pedestrian crossings and roads, street lighting, landscaping, street furniture including MSW containers and bins, or navigation signs, reorganized street parking or improved bus facilities; and better street crossings at appropriate locations) that can have adverse but small nature environmental impacts. This ESMP has been prepared as the sub-projects interventions have localized but minimum environmental and social impacts (identified and screened through ESMF checklist).

3.3.2 Natural Habitat (OP 4.04)

The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions.

This OP is not triggered as the sub-project interventions will not have any impact on natural habitats

3.3.3 Pest Management (OP 4.09)

Through this OP, the WB supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. This policy is triggered for A4N component as the component comprising activities engaging with pesticides and pest management.

This policy is not triggered since the sub-project components do not involve the use pesticide / pest management.

3.3.4 Indigenous People (OP 4.10)

For purposes of this policy, the term “Indigenous Peoples” is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing characteristics in varying degrees.

There are no indigenous people in the sub-project area. Hence OP 4.10 is not triggered.

3.3.5 Physical Cultural Resources (OP 4.11)

The World Bank’s general policy regarding cultural properties is to assist in their preservation, and to seek to avoid their elimination. The specific aspects of the Policy are given below.

- The Bank will assist in the protection and enhancement of cultural properties encountered in Bank-financed projects, rather than leaving that protection to chance. In some cases, the project is best relocated in order that sites and structures can be preserved, studied, and restored intact in situ. In other cases, structures can be relocated, preserved, studied, and restored on alternate sites. Often, scientific study, selective salvage, and museum preservation before destruction is all that is necessary. Most such projects should include the training and strengthening of institutions entrusted with safeguarding a nation’s cultural patrimony. Such activities should be directly included in the scope of the project, rather than being postponed for some possible future action, and the costs are to be internalized in computing overall project costs.
- This policy pertains to any project in which the Bank is involved, irrespective of whether the Bank is itself financing the part of the project that may affect cultural property.

The emergency sub-projects involve rehabilitation of roads and utility works at the existing roads, and development of parks. There are no buildings declared as “Protected Heritage” by the Government of Sindh (Under the Sindh Cultural Heritage (Preservation) Act 1994 on September 7, 1995)) in the Emergency Sub-project area. Therefore, this OP is not triggered.

3.3.6 Involuntary Resettlement (OP 4.12)

The WB’s experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe social and economic risks. This policy includes safeguards to address and mitigate these risks. The overall objectives of the Policy are:

- Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.

- Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development project providing sufficient investment resources to enable the persons displaced by the project to share in project benefits.
- Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them.

The components under sub-project will be undertaken on government land and existing ROW of sub-project roads. According to the social survey, there are no PAPs found in sub-project area where the sub-projects interventions are proposed. Also, the parking requirements during construction will be fulfilled while using existing roads in sub-projects area. There will be no involuntary resettlement for the proposed sub-project interventions.

3.3.7 Forestry (OP 4.36)

The objective of this Policy is to assist the WB's borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.

This policy is not triggered because the interventions of the sub-projects component will be developed in urban areas of Karachi District and will not be relevant to any reserved forest protected under Forest Department, Government of Sindh. Therefore, this OP is not triggered.

3.3.8 Safety of Dams (OP 4.37)

The Policy seeks to ensure that appropriate measures are taken, and sufficient resources provided for the safety of dams the WB finances.

This OP is not relevant since the proposed sub-projects does not involve construction of dams.

3.3.9 Projects on International Waterways (OP 7.50)

This OP defines the procedure to be followed for projects the WB finances that are located on any water body that forms a boundary between or flows through two or more states.

This OP is not triggered as the sub-projects interventions (involving rehabilitation and improvement of sewerage and storm water drainage systems in the subproject area) do not pollute the tributaries of Indus River System which as per Indus Water Treaty is designated as International Waterway between India and Pakistan.

3.3.10 Disclosure of Operational Information (BP 17.50)[5]

The World Bank recognizes that transparency and accountability are fundamental importance to the development process and to achieving its mission to alleviate poverty. Transparency is essential to building and maintaining public dialogue and increasing public awareness about the Bank's development role and mission. It is also critical for enhancing good governance, accountability, and development effectiveness. Openness promotes engagement with

[5] Safeguard Policies, A Quick Review – The World Bank, Tiblisi (April, 2008)

stakeholders, which, in turn, improves the design and implementation of projects and policies, and strengthens development outcomes. It facilitates public oversight of Bank-supported operations during their preparation and implementation, which not only assists in exposing potential transparency issues, but also enhances the possibility that problems will be identified and addressed early on.

In accordance with this Policy, the present ESMP will be disclosed to public and also available on the World Bank's Info Shop. The ESMP's executive summary Urdu translation will be available at the official website of the PIU (http://www.knip.gos.pk/). Administrative Framework

Environmental issues are governed by Provincial Government. The Government of Sindh (GoS) has designated its Environment, Climate Change & Coastal Development Department to administer matters related to the environment in Sindh.

3.3.11 Institutional Setup for Environmental Management

The highest environmental body in the country is the Pakistan Environmental Protection Council (PEPC), which is presided over by the Chief Executive of the country. Other bodies include the Pakistan Environmental Protection Agency (Pak-EPA), provincial EPAs (for four provinces, AJK and Northern Areas), and Environmental Tribunals. The Federal government has also formed the Federal EPA, which is headed by a Director General and has wide-ranging functions given in PEPA 1997. These include the preparation and coordination of national environmental policy for approval by the PEPC, administering and implementing the PEPA 1997 and preparation, revision or establishment of National Environmental Quality Standards (NEQS). The Provincial Environmental Protection Agencies are formed by the respective Provincial Governments. A Director General who exercises powers delegated to him by the Provincial Government heads each Provincial EPA. IEEs and EIAs are submitted to provincial EPAs for approval.

3.4 Environmental and Social Guidelines

Two sets of guidelines, the Pakistan-EPA's guidelines and the World Bank Guidelines are reviewed here. Since Sindh EPA has not formulated separate guidelines therefore, Pakistan EPA's guidelines have been benefited from. These guidelines address the environmental as well as social aspects.

3.4.1 Environmental Protection Agency's Environmental and Social Guidelines

The Federal EPA has prepared a set of guidelines for conducting environmental and social assessments. The guidelines derive from much of the existing work done by international donor agencies and NGOs. The package of regulations, of which the environmental and social guidelines form a part, includes the PEPA 1997 and the NEQS. These guidelines are listed below followed by comments on their relevance to proposed project:

- Policy and Procedures for Filing, Review and Approval of Environmental Assessments, Pakistan Environmental Protection Agency, September 1997: These guidelines define the policy context and the administrative procedures that govern the environmental assessment process from the project pre-feasibility stage to the approval of the environmental report. The section on administrative procedures has been superseded by the IEE-EIA Regulations, 2000.

- Guidelines for the Preparation and Review of Environmental Reports, Pakistan Environmental Protection Agency, 1997: The guidelines on the preparation and review of environmental reports target project proponents and specify:
- The nature of the information to be included in environmental reports
- The minimum qualifications of the EIA conductors appointed
- The need to incorporate suitable mitigation measures at every stage of project implementation
- The need to specify monitoring procedures.
- The terms of reference for the reports are to be prepared by the project proponents themselves. The report must contain baseline data on the Study Area, detailed assessment thereof, and mitigation measures.
- Guidelines for Public Consultation, Pakistan Environmental Protection Agency, May 1997: These guidelines support the two guidelines mentioned above. They deal with possible approaches to public consultation and techniques for designing an effective f consultation that reaches out to all major stakeholders and ensures the incorporation of their concerns in any impact assessment study.
- Guidelines for Sensitive and Critical Areas: The guidelines identify officially notified protected areas in Pakistan, including critical ecosystems, archaeological sites, etc., and present checklists for environmental assessment procedures to be carried out inside or near such sites. Environmentally sensitive areas include, among others, archaeological sites, biosphere reserves and natural parks, and wildlife sanctuaries and preserves.

3.4.2 World Bank Social Guidelines

The principal World Bank publications that contain environmental and social guidelines are listed below.

- Environment, Health, and Safety (EHS) Guidelines prepared by International Finance Corporation and World Bank in 2007
- Pollution Prevention and Abatement Handbook 1998: Towards Cleaner Production
- Environmental Assessment Sourcebook, Volume I: Policies, Procedures, and Cross-Sectoral Issues.
- Social Analysis Sourcebook

In case of any conflict between the above guidelines and the ones discussed under Section 3.5.1, the WB guidelines will be followed.

Chapter 4. Environmental Baseline of Sub-Project Areas of Malir

This section of the ESMP presents specific existing environmental conditions of the KNIP sub-projects of Malir Neighborhood, *i.e*., Kalaboard to Saudabad Chowrangi; RCD Ground; Saudabad Chowrangi to Urdu Chowk Stop; Saudabad Chowrangi to Jinnah Square and Sommar Kandani to Memon Goth Road. The baseline conditions cover the existing physical, ecological, and Socio-Economic environment of the sub-project areas. The relevant information on these aspects have been derived from primary and secondary data sources. The primary data was developed through extensive field visits and surveys in and around project vicinity, including analyses performed on-site, drone imaging and within recognized laboratories. The secondary data include data collected from previous studies, Satellite Remote Sensing, as well as information obtained through visits to the Governmental Departments and other lined agencies.

Figure 4-1: Primary Data Collection through Field Surveys

4.1 Physical Environment

Physical environment of sub-projects includes topography, geology, climate and meteorology, air quality, ambient noise, water and wastewater quality. Data on geology and topography were basically required to evaluate the terrestrial resources. Baseline data on the meteorology

describes the climatic conditions and quality of air. Similarly baseline data on water quality describes the hydrology and quality of surface and groundwater as well as water availability.

4.1.1 Study Area

The five sub-projects are herein referred as Sub-Project number and are illustrated in Figure 4-2

i. Kalaboard to Saudabad Chowrangi (3.2 km)
ii. Malir RCD Ground (55,400 sq.ft)
iii. Road from Saudabad Chowrangi to Urdu Chowk Bus stop on Liaquat Market road (0.3 km)
iv. Saudabad Chowrangi to Nade Ali Road up to Jinnah Square Chowrangi (1.2 km)
v. Soomar Kandani to Memon Goth Road (1.5 km)

The first four (04) of the five (05) sub-projects listed above are located in the District Korangi, one of the seven Districts of Karachi Division. Korangi District is one of the largest industrial hubs and home to two of the largest oil refineries of the country. As per the recent population Census of 2017 with 2,457,019 residents, Korangi stands out as the second largest industrial zone in the city. It borders with Malir River and has many noticeable creeks within its vicinity, Gizri Creek being the most ecologically important one.

The remaining one Sub-Project (v) is situated in District Council, is one of the oldest rural areas of Karachi. Malir District covers up the largest land area of Karachi division and is home to most of the rural population of the city. Coastline bordering its south, Malir District makes up for most of the border of Karachi Division. Malir holds a population of 2,008,901 persons amongst which there are 149,820 rural and 188,437 urban households. Malir connects with the Kirthar National Park and covers most of the highland area of Karachi spatially.

These Sub-Projects are interlinked with a number of major roads which include National Highway N5, Shah Faisal Avenue Road, Suadabad Road, Nisa Street, Moinabad Road, Liaqat Road, Khulfa-e-Rashideen Road, Kamran Matloob Hussain Road, Fatima Road, Begum Khursheed Road, Adeel Ahmed Siddiqui Street and Saudabad Chowrangi.

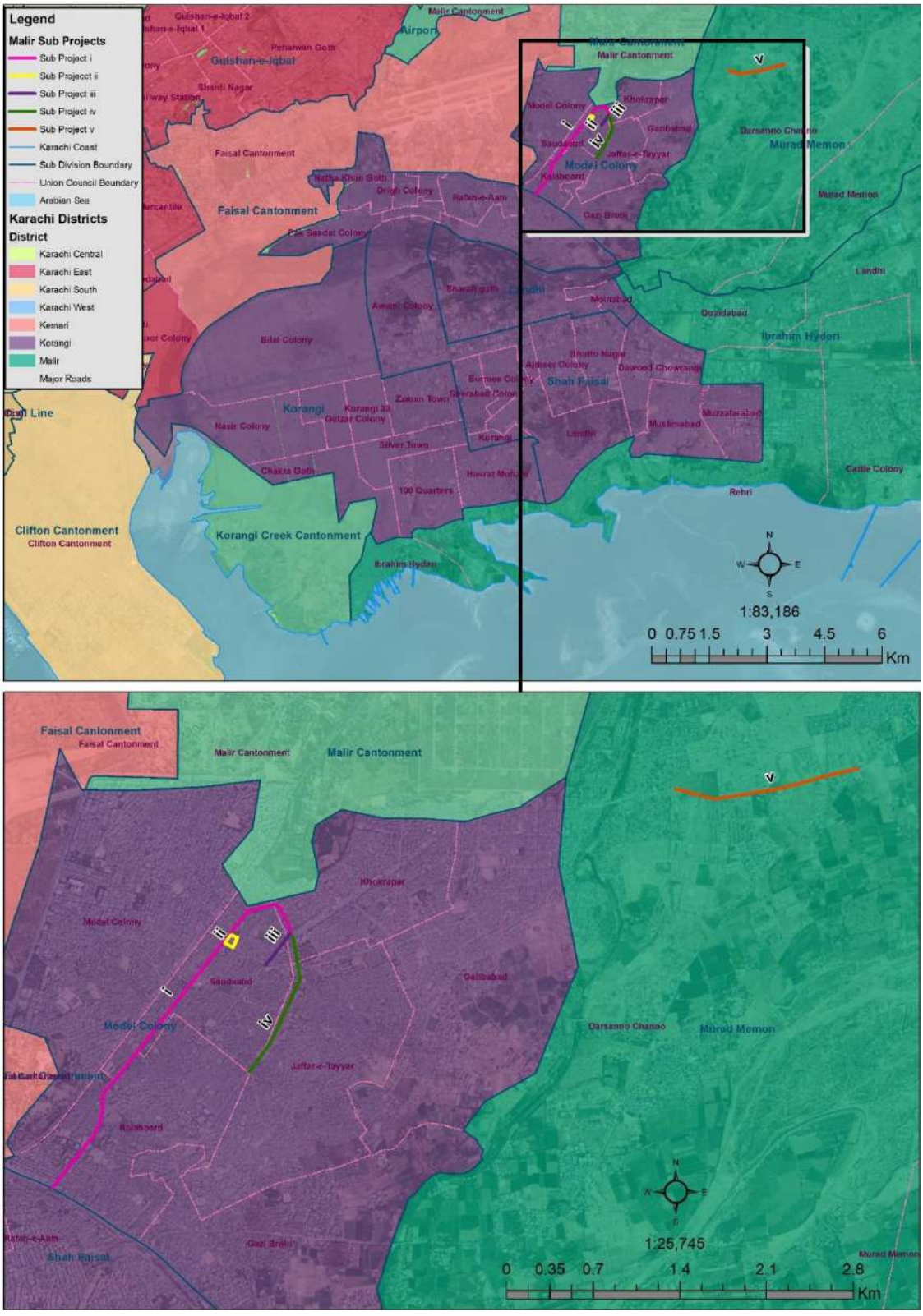


Figure 4-2 : Study Area

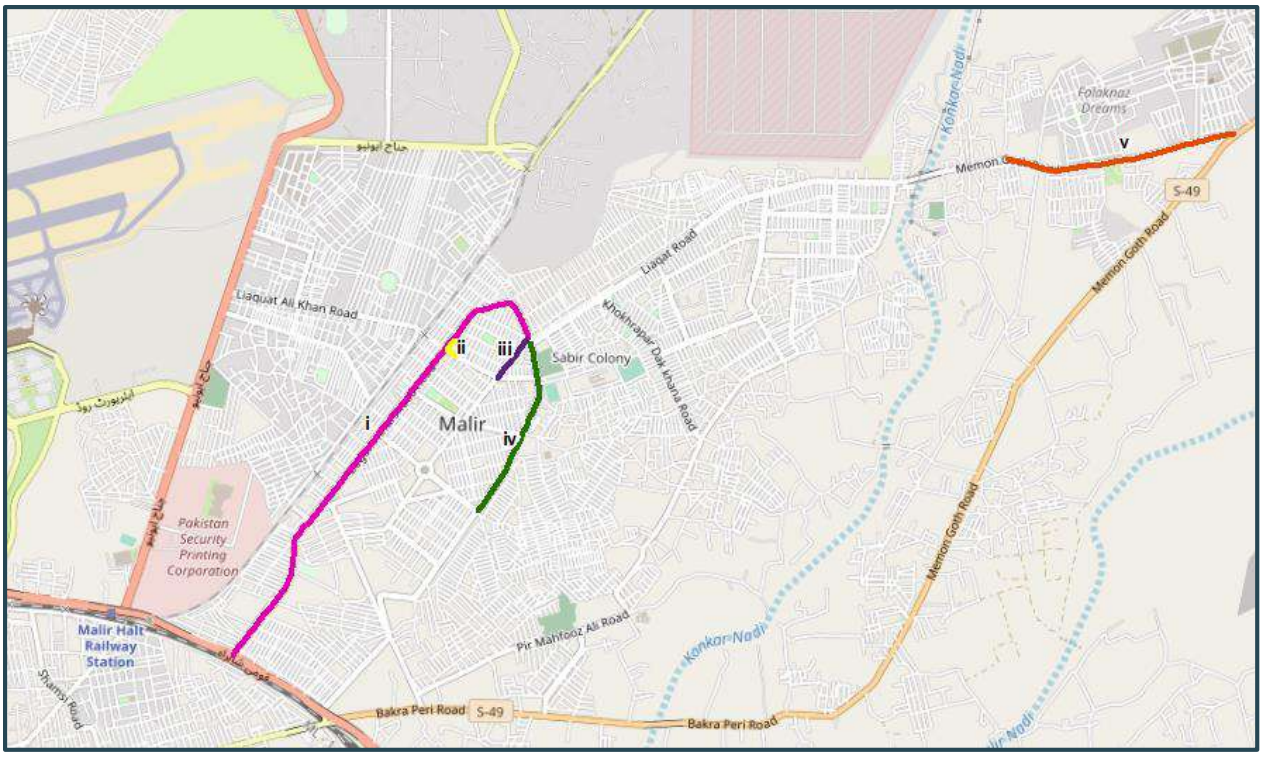


Figure 4-3: The subproject (i), (iii) and (iv) are connected with Sub-Project (v) via Liaqat Road

4.1.1.1 Major Landmarks near Sub-projects

Major landmarks within (3 km) vicinity of the Sub-Projects include:

- Jinnah International Airport
- Malir Cantonment
- Pakistan Security Printing Corporation
- Malir Halt Railway Station

While Sub-Projects are not going to impose any direct impacts on any of the above-mentioned landmarks. On the contrary, they will facilitate the commuters of these destinations and improve the environmental conditions considerably.

4.1.2 Topography

Karachi Division is covered with more than 50% of high terrain but with highly varied topography. The city lies very close to a major fault line, where the Indian tectonic plate meets the Arabian plate. The landscape of lower Sindh has been developed under subtropical semi-arid conditions, the aridity of the climate has resulted in the Karachi, having generally a barren appearance. Vegetation is poor and scanty except at few points at Malir, where the groundwater aquifers are available allowing cultivation. The alluvial plains of the rivers Lyari and Malir, saltish where the sea is near at land, usually support only the growth of scrub and hummocks of coarse grass. Jutting from these plains, barren rocky outcrops form ridges and low hills.

The western border of Karachi is skirted by the Kirthar Range, which lies north and south. The low hills of the Kohistan area are not continuous with the Kirthars but belong to the same system and may be considered as outlying evidence of the same folding.

The sea is completely shallow close to the Port Qasim area. In the vicinity of the eastern coast, salt flats, sea creeks and mangrove swamps found but in highly fragile conditions.[6]

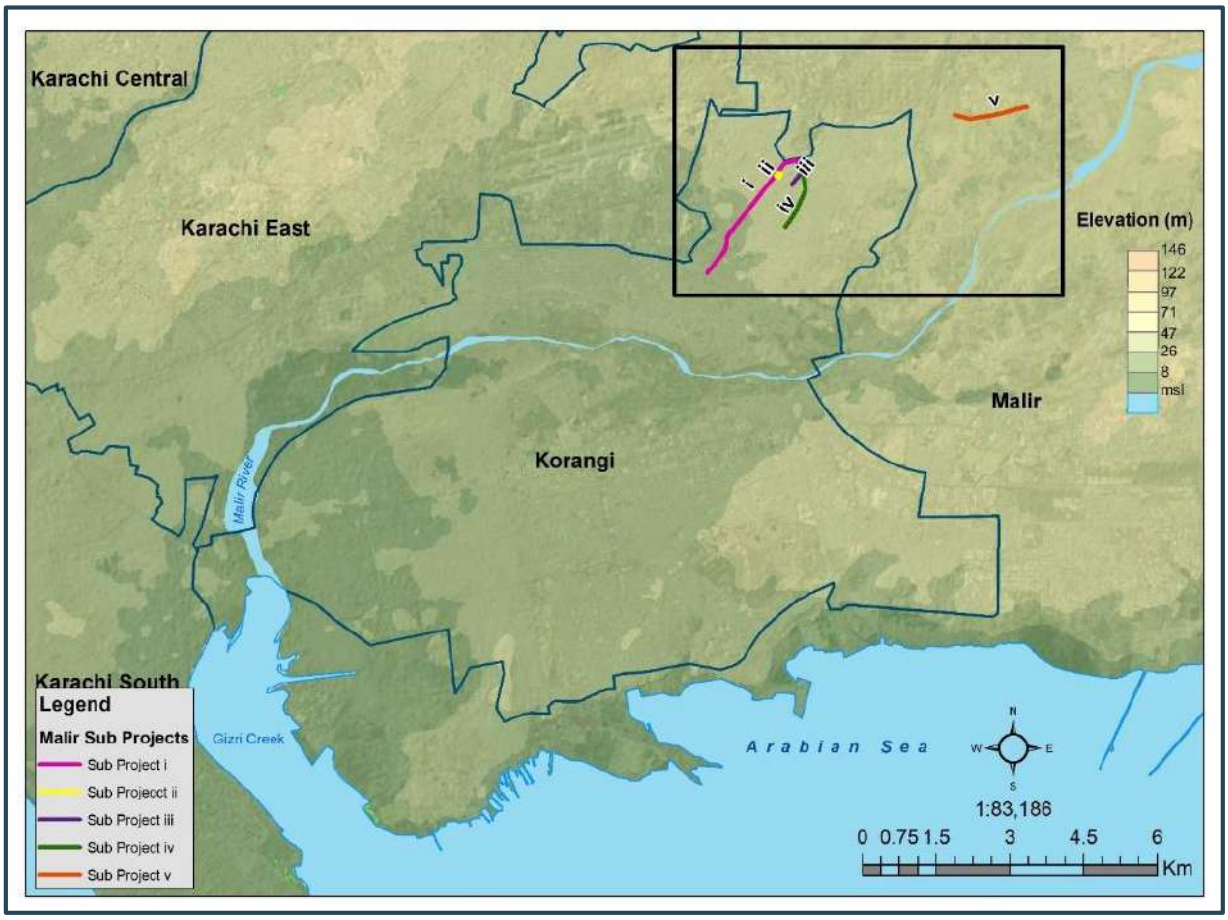


Figure 4-4 : Topography around the Project area

To develop a 3D profile of the specific subproject sites, detailed aerial surveys were conducted by the Consultant through drone technology. Figure 4-5 - Figure 4-9 show longitudinal elevation path profiles of all the Sub-Projects that were extracted from 3D Point-cloud generated from the aerial imageries using Pix4d software. These elevation profiles are very helpful to comprehend the drainage pattern and accumulation of water in stormwater drains. The flood accumulation trends will be extracted and would be helpful to develop “Climate Proof” designs.

Figure 4-5 show the elevation of Sub-Project-i (from Kalaboard to Saudabad Chowrangi) having total length of 3.2 km, ranged from 22.801 m at Kalaboard to 32.051 m at Saudabad Chowrangi.

[6] Geology and Geography of Karachi and its Neighbourhood by *Manick B. Pithwala (1950)*

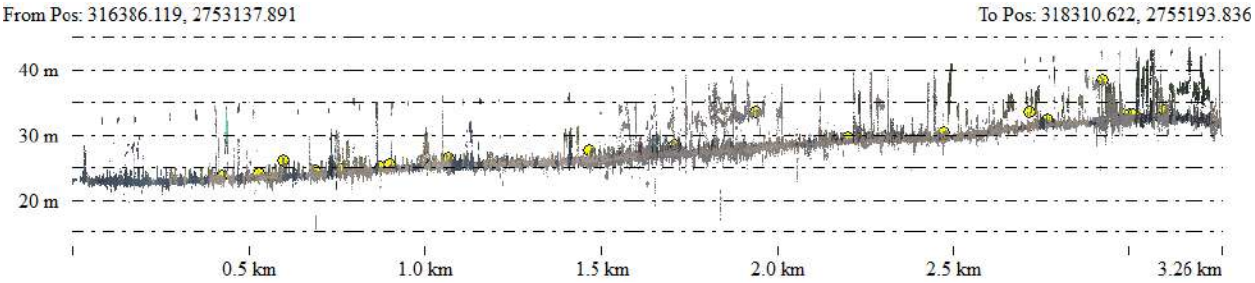


Figure 4-5 : Elevation Profile of Sub-Project-i

Figure 4-6 show the cross section of RCD Ground Malir (Sub-Project-ii) based on aerial data illustrates the land levels of the ground averaging at 29.4 m and ranging between 29.3 m and 29.5 m.

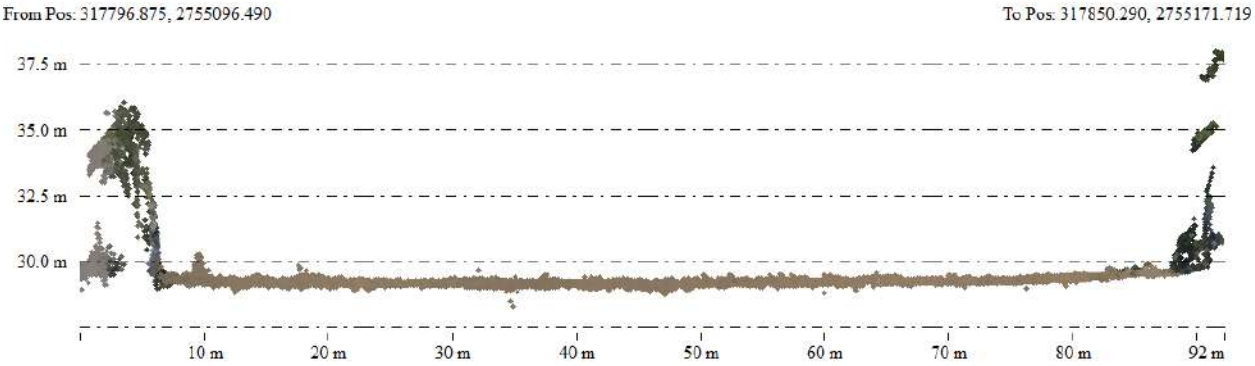


Figure 4-6 : Cross Section Elevation Profile of Sub-Project-ii

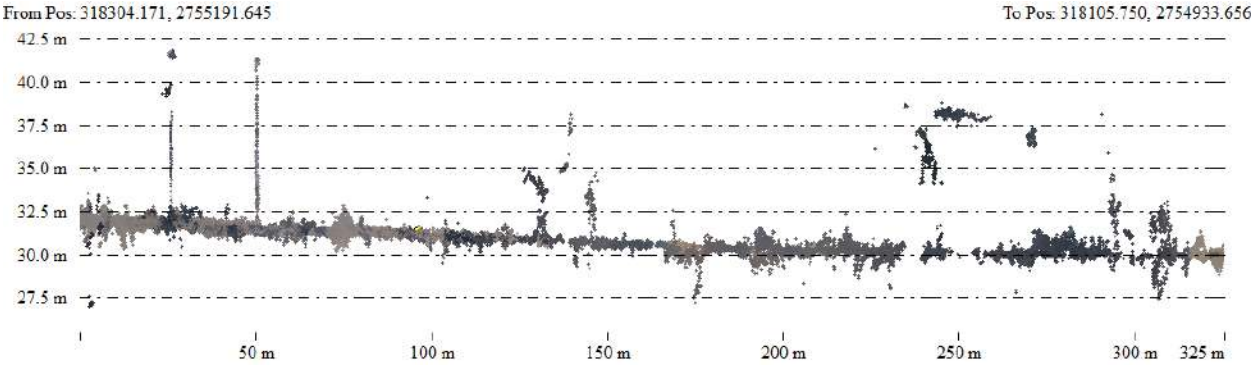


Figure 4-7 : Elevation Profile of Sub-Project-iii

A gentle slope is revealed from elevation profile of Sub-Project iii (Figure 4-7) which varies in elevation from 32.051 at Saudabad Chowrangi to 29.96m at Urdu Chowk Bus Stop.

Figure 4-8 show elevation profile of Sub-Project-iv starting from an elevation of 31.8 m at Saudabad Chowrangi, the road terminates at Jinnah Square at an elevation of 28.672 m.

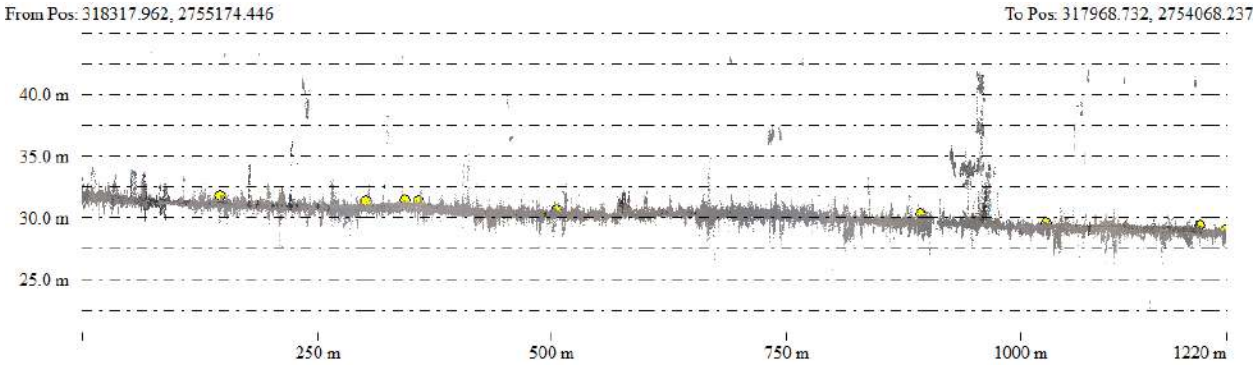


Figure 4-8 : Elevation Profile of Sub-Project-iv

Figure 4-9 show that the Sub-Project-v has relatively gentle surface starting from Soomar Kandani at 38.446 m and gradually raising up to 39.92 m where the road of the subproject ends and opens onto main Memon Goth Road.

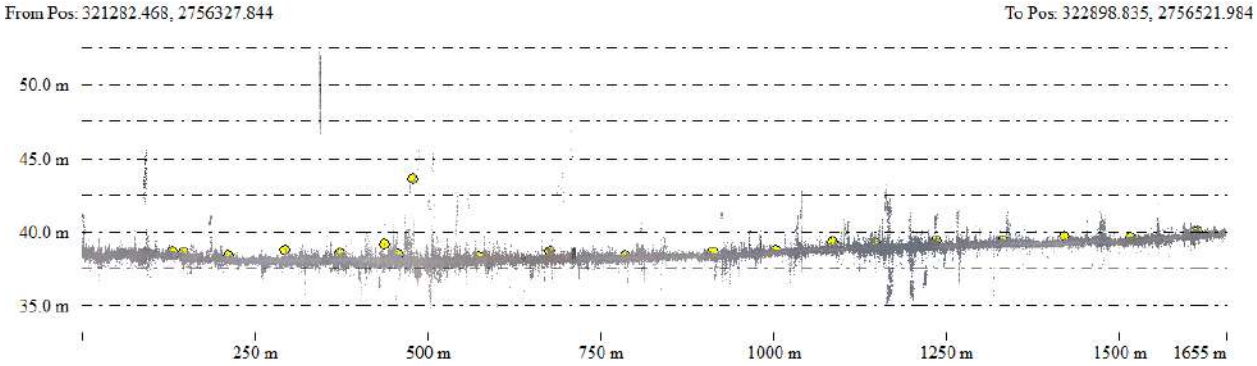


Figure 4-9 : Elevation Profile of Sub-Project-v

4.1.3 Geology

Within the Karachi Division and around sub-project areas, only the Middle and Upper tertiaries are represented. Nari beds of the Oligocene system form the lowermost outcrops. Quaternary deposits are represented by an extensive conglomerate along Malir Valley, which unconformably overlies the Manchar rocks and slightly overlaps on to the Gaj series. Of comparatively recent origin are the alluvial sands and gravels deposit mainly found in the project area of Malir neighborhood, along with wind-blown materials and other shoreline deposits. All subprojects of lies on the alluvial deposit region of Malir River System.

All subprojects fall under moderate seismic risk and no major earthquake reported in the recent history of the area. (Fig. 4-10).

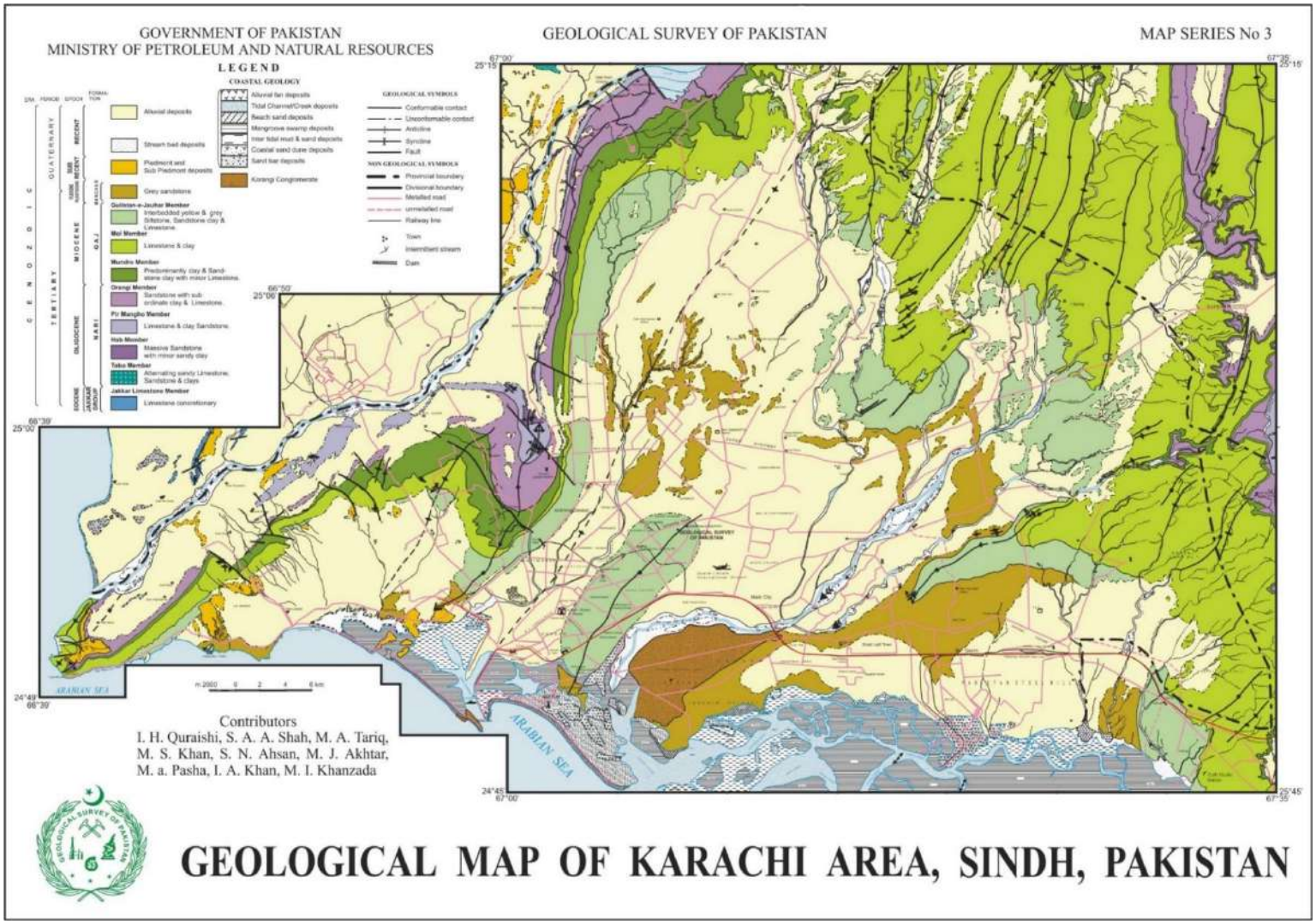


Figure 4-10 Geological Map of Karachi (Source: Geological Survey of Pakistan)

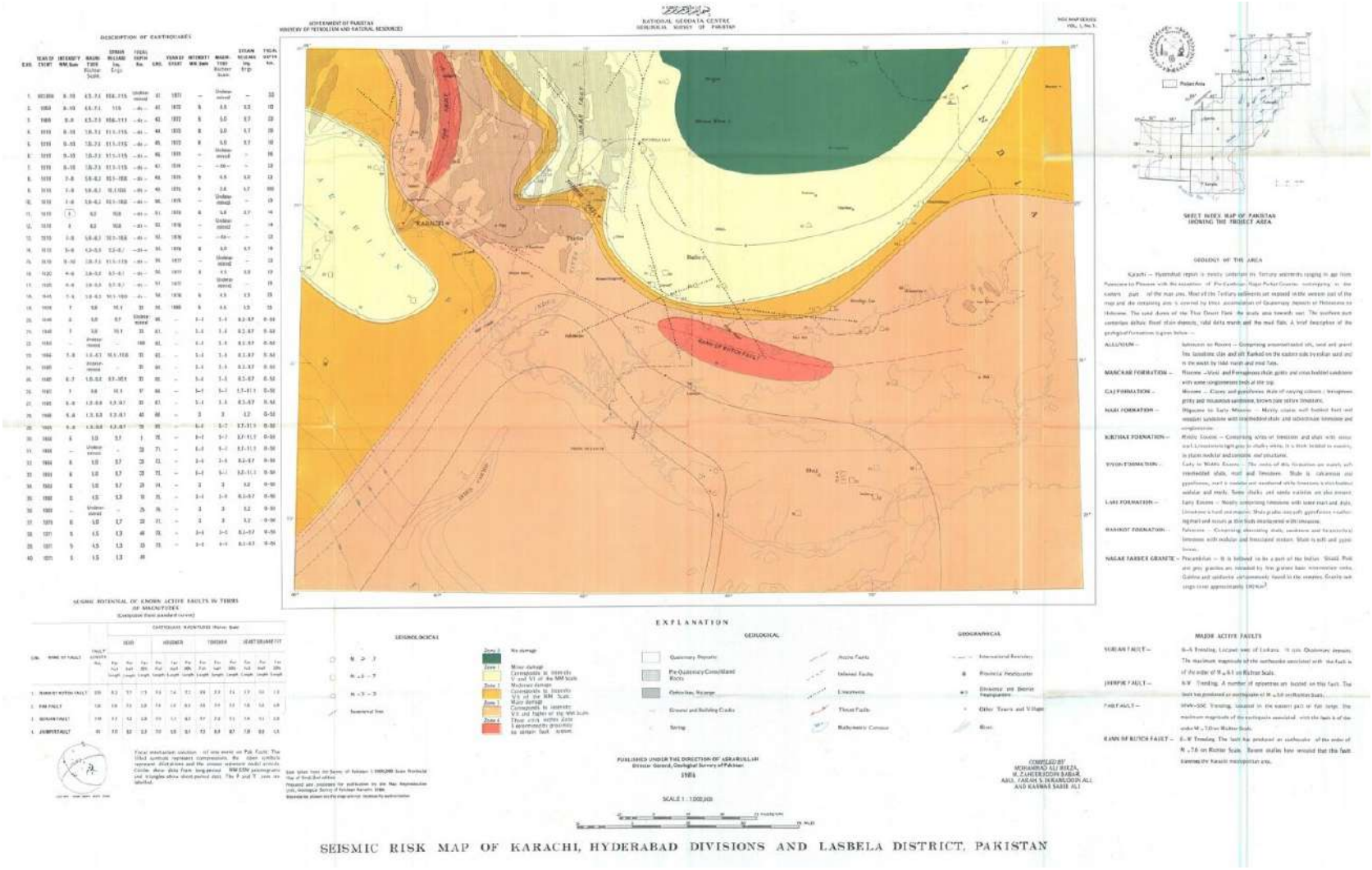


Figure 4-11 Seismic Risk of Karachi Division (Source: Geological Survey of Pakistan)

4.1.4 Seismology

Karachi, with its over 20 million residents is located near a plate boundary and is susceptible to earthquakes because of presence of various tectonically active structures including active, near and thrust faults, surrounding the city. Yet, Karachi has not experienced very damaging events in the recent past.

But the possibility of Karachi's susceptibility to earthquakes cannot be ruled out, because of presence of a subduction zone at a striking distance from the coastal city, which can trigger a Tsunami. As was the case of damaging tsunami associated with the 1945 Earthquake.

Figure 4-11 shows the seismic hazard map of Karachi and surrounding districts. The seismicity is divided into four (04) zones with an increasing order of damage caused as a result of seismic activity. Most of Karachi's landscape lies in Zone 3 which is susceptible to Major damage with respect to intensity and magnitude of the earthquake.

The 05 sub projects of Korangi and Malir also lie in the Zone 3. However, there hasn't been damaging earthquakes in sub-project areas over past 150 years except a few events large enough to be felt.

4.1.5 Soil

Soil type in Karachi is dominantly Piedmont plain. The whole region of Malir is formed of Upper Tertiary limestone, sandstone, clay and post-Tertiary gravel and loose sand, which is covering most of the subprojects of Malir Neighborhood. Upon the bedrock there is a continuous layer of *murram* (gravel) and sand to a depth of 100 feet. Into this porous alluvium an inexhaustible flow of freshwater aquifers is locked up, which usually help in the agricultural practices of the Malir area.[7] A large portion of subprojects i-iv mainly fall in urban category (unclassified) on the map because of the heavy built-up land.

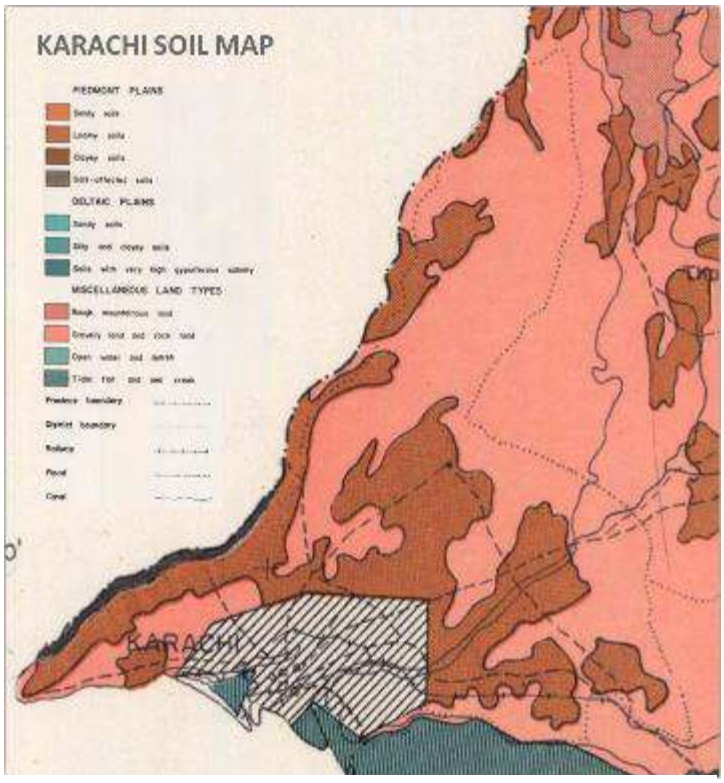


Figure 4-12 Karachi Soil Map (Source: Soil Survey of Pakistan)

4.1.6 Climate and Meteorology

The only Meteorological station available within 3 km vicinity of all the Sub-Projects is Karachi Airport (AP) meteorological station located at Jinnah International

[7] An Introduction to Karachi, its Environs and Hinterlands by Manick B. Pithawala (1950)

Airport and owned by Pakistan Meteorological Department (PMD). This station measures the overall data of multifarious climatic parameters of Karachi. The most recent data of Karachi (AP) was acquired from the Meteorological Station as well as Weather Spark[8] website to present the meteorological situation of Sub-Project areas.

Table 4-1: Station Details of Karachi (AP)

Latitude	WMO No:	41780	Elevation	21 m	Height of		
24° 54' N							
Longitude	ICAO ID:	OPKC	Established in 1928		Barometer (amsl)	Anemometer (agl)	Steven Screen (amsl/agl)
67° 08' E					22 m	07 m	21m/1.2 m

In Karachi, the summers are hot, oppressive, arid, and windy. The winters are short, comfortable, and dry and it is mostly clear year-round. Karachi has pleasant weather for the greater part of the year. High humidity in the region does not permit evaporation of stagnant water in some places. The city faces persistent air pollution through fumes from various factories and automobiles that contribute mainly to air pollution, despite land and sea breezes. The overwhelming impact of the concrete jungle of the city infra-structure and recent impacts of climate change are well noticed, often emerged in the form heat-waves, unprecedented floods and non-seasonal cyclones. Few incidence of these calamities were also noticed in the subproject areas.

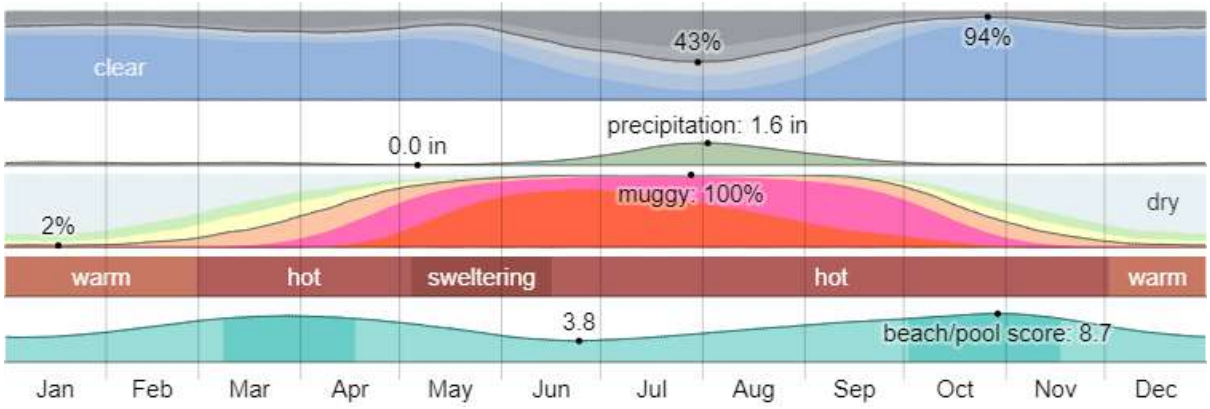


Figure 4-13 : Overall Climate in Karachi (2010-2021) (Source: Weather Spark)

4.1.6.1 Temperature

The hot season lasts for 3.4 months, from April 1 to July 13, with an average daily high temperature above 32.7°C. The hottest month of the year in Karachi is June, with an average high of 34.4°C and low of 28.8°C.

Table 4-2: Monthly Average, high and low temperatures of Karachi (2010-2021) (Source: Weather Spark)

[8] https://weatherspark.com/y/148942/Average-Weather-at-Karachi-Airport-Pakistan-Year-Round#Figures-Temperature

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	25.3° C	27.5° C	30.8 °C	33.55 °C	34.1° C	34.1 °C	31.9 °C	30.8 °C	31.9 °C	33.55 °C	30.8 °C	26.95 °C
Average Temp.	19.25 °C	21.45 °C	25.3 °C	28.05 °C	30.25 °C	30.8 °C	29.7 °C	28.6 °C	28.6 °C	28.05 °C	24.2 °C	20.35 °C
Low	12°C	14°C	18°C	22°C	24.5° C	26°C	25.5 °C	24.5 °C	23.5 °C	21°C	16.5 °C	12.5° C

The cool season lasts for 1.8 months, from December 17 to February 12, with an average daily high temperature below 27.2°C. The coldest month of the year in Karachi is January, with an average low of 13.3°C and high of 25.5°C.

Karachi has pleasant weather for the greater part of the year. However, spells of heat waves occasionally prevail in May and October, during which the temperature shoots up to 41 °C. A biting north wind occasionally blows in the months of January and February, during which the temperature may drop to 4 °C (40 °F).

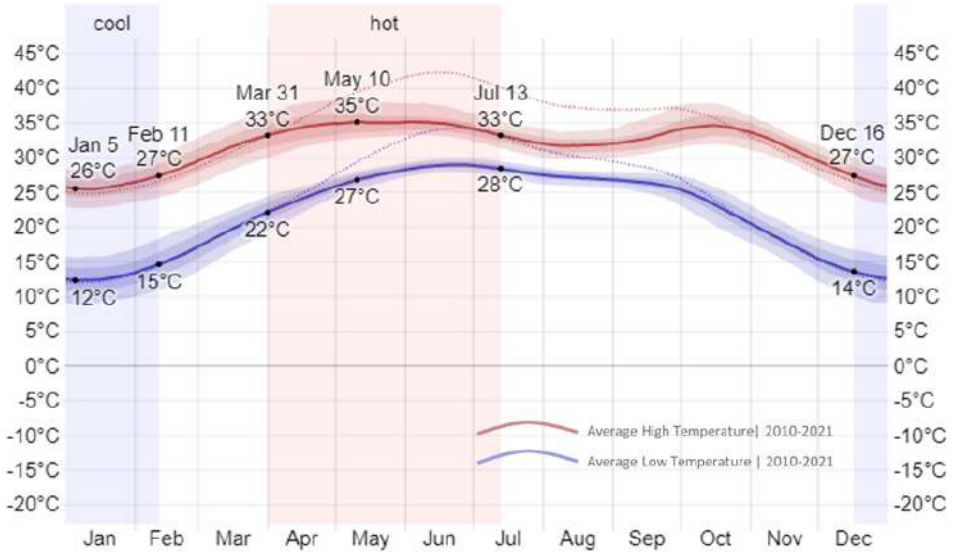


Figure 4-14 Average high and Low Temperature from 2010-2021 in Sub-Project areas (Source: Weather Spark)

In Figure 4-14 the daily average high (red line) and low (blue line) temperature. The thin dotted lines are the corresponding average perceived temperatures.

As per the proposed timeline of sub-projects implementation, construction is expected to start in January 2022 and may extend till June 2022. According to Figure 4-14, the first three (03) months of the construction period have cool to warm temperatures, however, the last three (03) months i.e., April, May, and June may experience hot to sweltering temperatures.

Knowing the climatic condition of the construction area is very crucial not only for the implementation of the sub-project but most importantly for the safety of construction workers. Construction work can be very labor-intensive which can cause the body to generate excessive heat. Construction workers exposed to hot environments or extreme heat can be at risk of heat-related illnesses (HRIs) and injuries. Heat stress is the combination of a worker's exposure to heat from physical activity, environmental factors, and their clothing and since the

construction on sub-project sites will be occurring under direct sunlight on roadside and roadways, knowing the daily and hourly temperature is crucial to determine the working hours and ensuring the provision of appropriate mitigation measures.

Likewise, in January, temperatures are usually cool in Karachi, however, protective measures will still be ensured.

To avoid any unfortunate event, the following steps will be taken to protect construction workers from the adverse health effects of working in the heat/cold:

- Engineering and work practice controls,
- Training and acclimatization (allowing the body to gradually adjust to the heat),
- Measuring and assessing heat stress,
- Medical monitoring and heat-protective clothing and personal protective equipment (PPE)

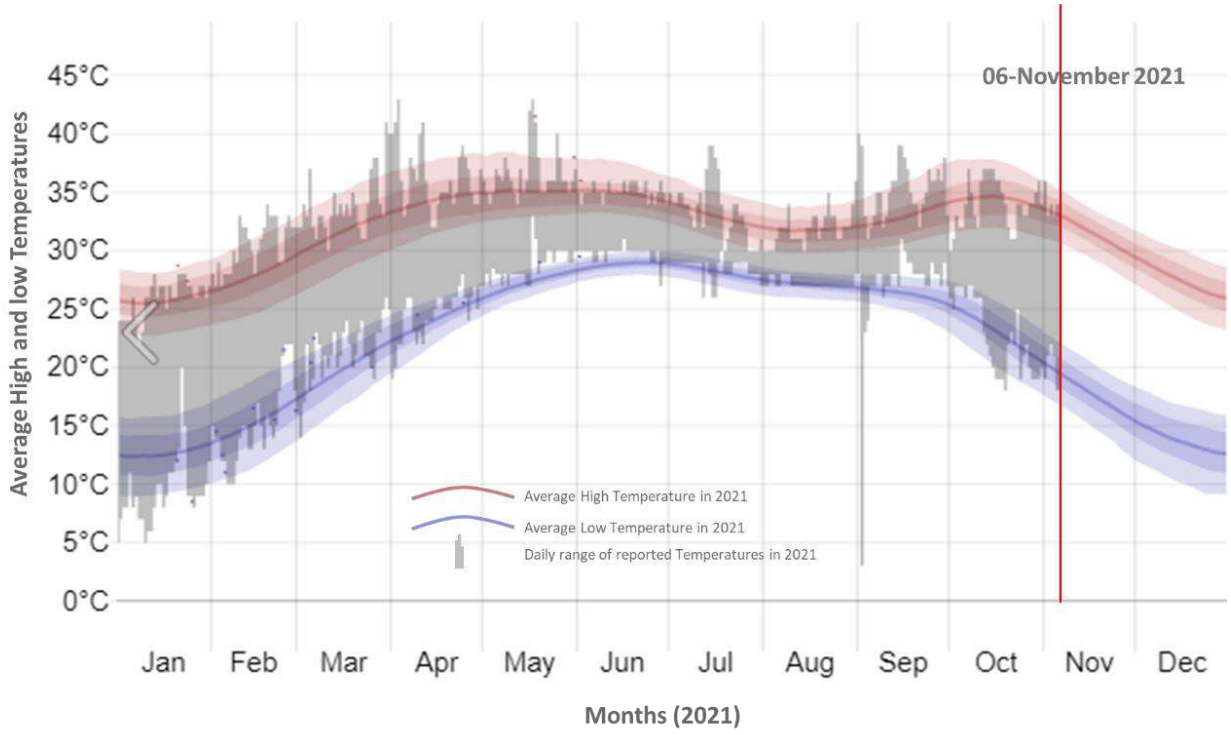


Figure 4-15 Average High and Low Temperatures over Months of 2021

shows a compact characterization of the of hourly average temperatures from 2010 to 2021. The horizontal axis is the day of the year, the vertical axis is the hour of the day, and the color is the average temperature for that hour and day.

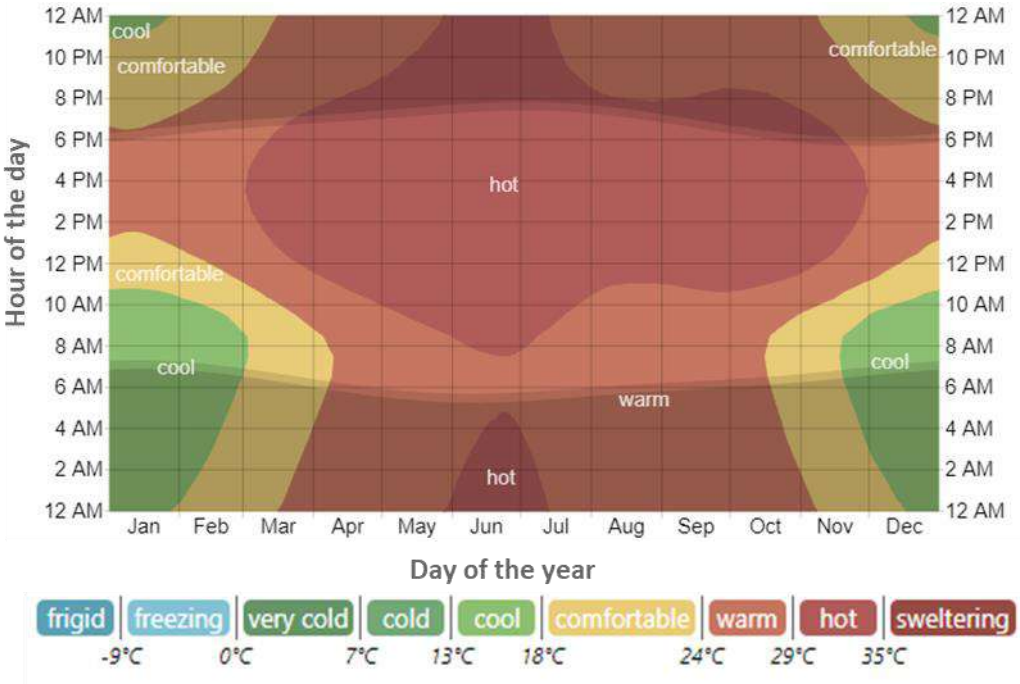


Figure 4-16 : Average Hourly Temperature in Sub-Project Areas | 2010-2021 (Source: Weather Spark, 2021)

The usual working hours are from 8:00 am to 6:00 pm in Sub-Project sites. While the remaining hours are used for commute to and from the workplaces and other personal activities. In January, February, March, November and December, the early hours of work are usually comfortable and range from cool to moderate temperatures, however, from 2:00 pm to 6:00 pm, temperature is mostly warm. But that is not the case in spring to autumn months, starting from early March to late November when temperature from 2:00 pm to 6:00 pm on the clock is hitting highest degrees for the day and goes beyond warm to hot weather. This is the time when residents and users of the sub-project areas are highly susceptible to heat stress.

The working hours of construction workers on roadways will be determined based on daily monitoring of temperatures and heat stress hours will be avoided by taking aforementioned measures which are described in detail in EMMP.

The Overall temperatures in the Sub-Projects of Malir neighborhood are relatively moderate compared to the core areas of the city because of the proximity of agricultural and green areas and influence significant impact of the sea breeze in the area.

4.1.6.2 Clouds

In Karachi, the average percentage of the sky covered by clouds experiences extreme seasonal variation over the course of the year. The clearer part of the year in Karachi begins around September 7 and lasts for 9.1 months, ending around June 12.

The clearest month of the year in Karachi is October, during which on average the sky is clear, mostly clear, or partly cloudy 92% of the time. The cloudier part of the year begins around June 12 and lasts for 2.9 months, ending around September 7. The cloudiest month of the year in Karachi is July, during which on average the sky is overcast or mostly cloudy 52% of the time.

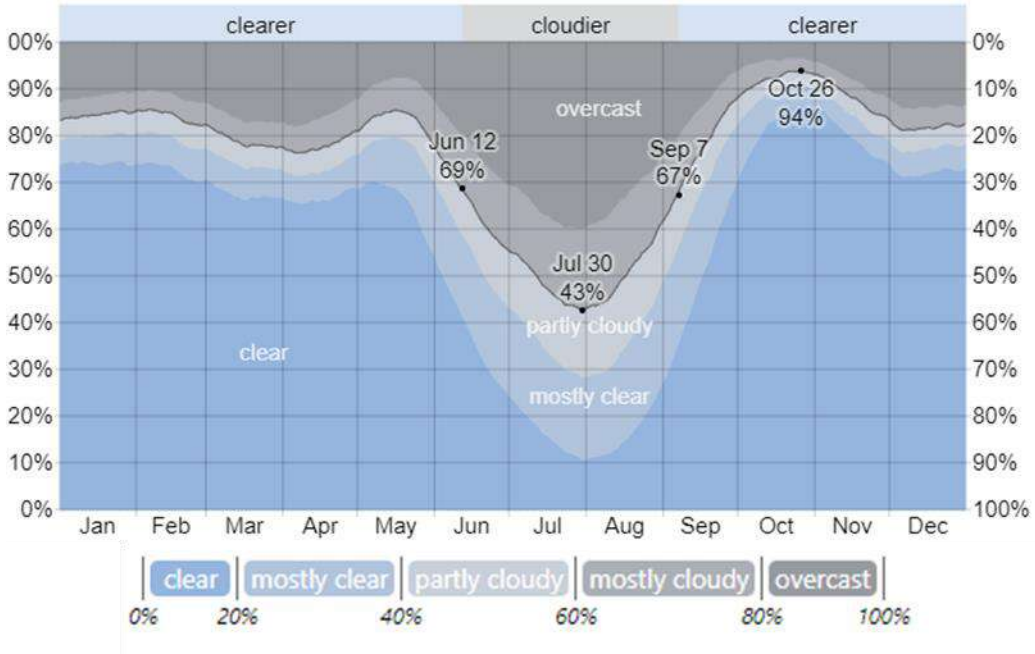


Figure 4-17 : Cloud Cover Categories at Sub-Project Areas | 2010-2021(Source: Weather Spark)

4.1.6.3 Precipitation

The rainy period of the year lasts for 2.7 months, from June 25 to September 15, with a sliding 31-day rainfall of at least 13 millimeters. The month with the most rain at Sub-Project areas is August, with an average rainfall of 34 millimeters. The rainless period of the year lasts for 9.3 months, from September 15 to June 25. The month with the least rain at Sub-Project areas is May, with an average rainfall of 1 millimeter. Sometimes the accumulation of heavy rainfall is common phenomenon in the project area, causing dismantling of the social process.

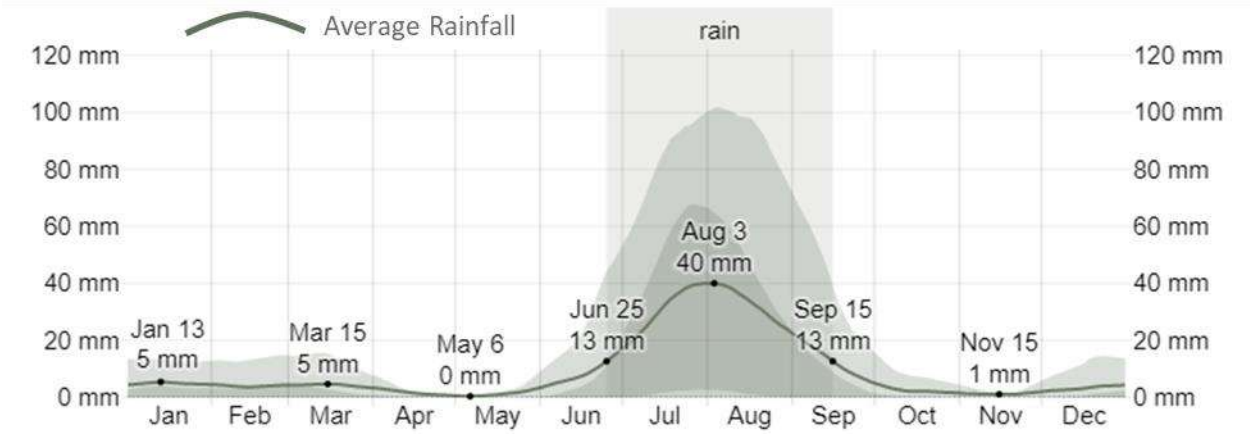


Figure 4-18 : Average Monthly Rainfall at Sub-Project Areas | 2010-2021 (Source: Weather Spark, 2021)

4.1.6.4 Sunlight

The length of the day at sub-project areas varies over the course of the year. In 2021, the shortest day is December 21, with 10 hours, 35 minutes of daylight; the longest day is June 21, with 13 hours, 41 minutes of daylight.

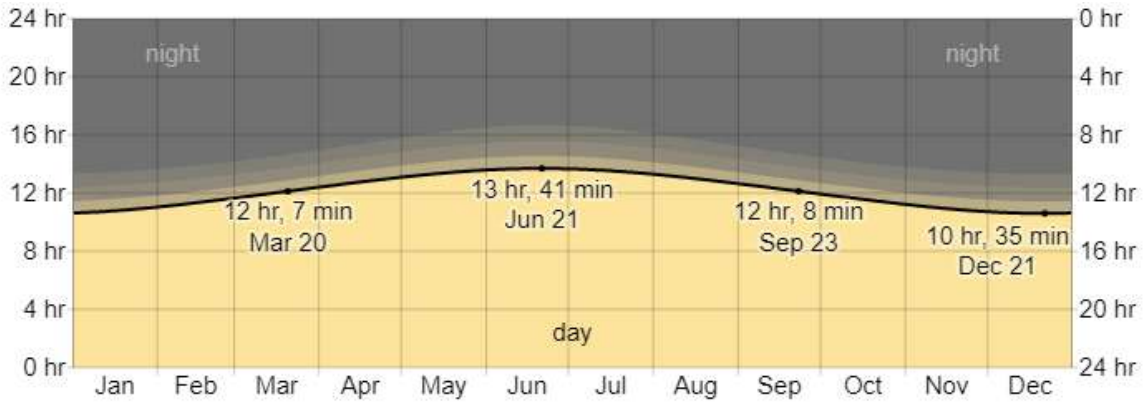


Figure 4-19 : Hours of Daylight and Twilight at Sub-Project Areas in 2021 (Source: Weather Spark)

4.1.6.5 Humidity

Sub-Project areas experience extreme seasonal variation in the perceived humidity. The muggier period of the year lasts for 7.6 months, from March 18 to November 7, during which time the comfort level is muggy, oppressive, or miserable at least 27% of the time. The month with the most humid days at areas of interest is July, with 31 days that are stifling or worse. The month with the fewest humid days at Sub-Project areas is January, with 0.7 days. The percentage of time spent at various humidity comfort levels, categorized by dew point is displayed by different colors. The proximity of the coastline is the main factor behind high humidity in the subproject areas particularly and generally in Karachi city.

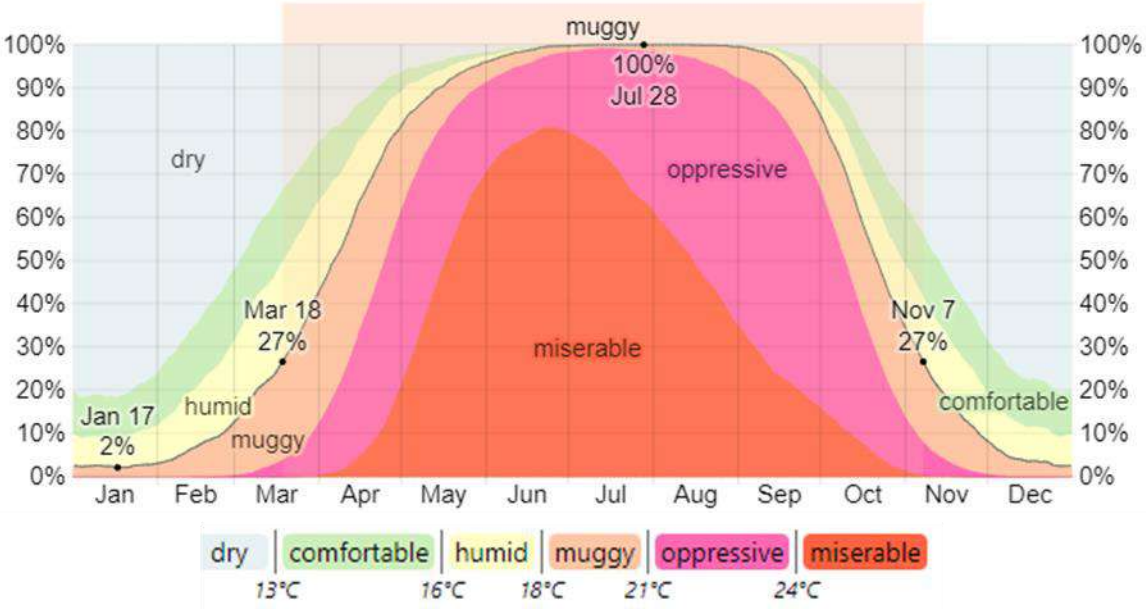


Figure 4-20 : Average Humidity Comfort Levels at Sub-Project Areas|2010-2021 (Source: Weather Spark, 2021)

4.1.6.6 Wind Speed and Direction

The average hourly wind speed at Sub-Projects experiences variation over the course of the year. The windier part of the year lasts for 5.1 months, from April 15 to September 18, with average wind speeds of more than 4.9 meters per second. The windiest month of the year at Sub-projects is June, with an average hourly wind speed of 6.5 meters per second.

The calmer time of year lasts for 6.9 months, from September 18 to April 15. The calmest month of the year at Sub-Project areas is November, with an average hourly wind speed of 3.1 meters per second.

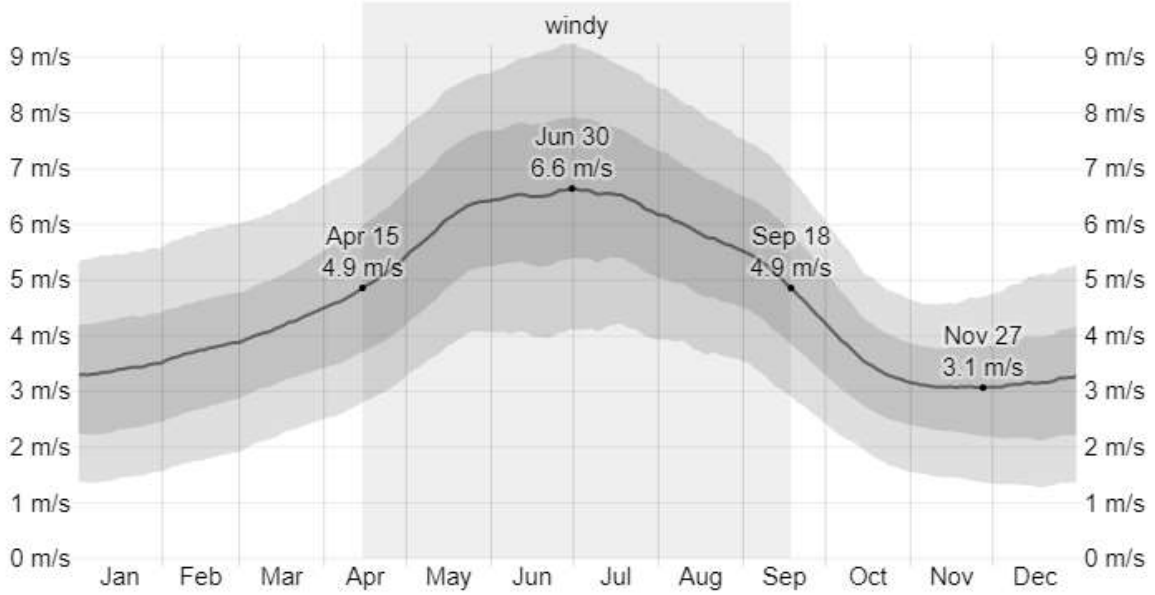


Figure 4-21 : Average Wind Speed at Sub-Project Areas | 2010-2021 (Source: Weather Spark, 2021)

Figure 4-22 illustrates the hourly reported wind speed in Sub-Projects, color coded into bands according to the Beaufort scale. The shaded overlays indicate night and civil twilight.

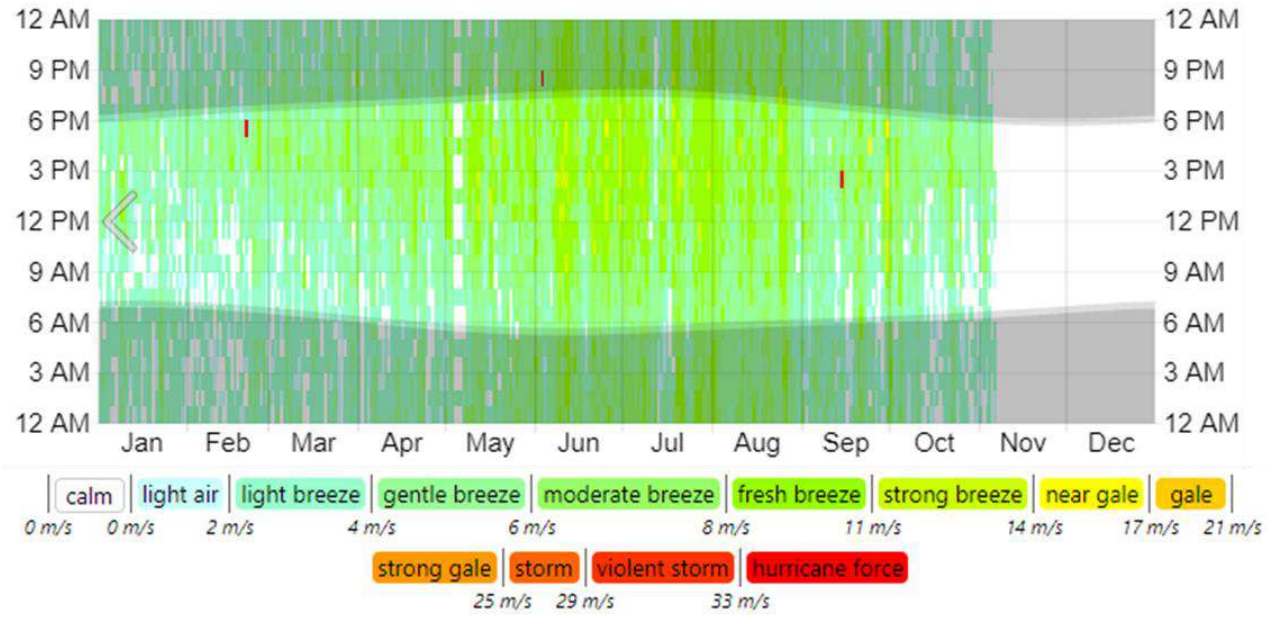


Figure 4-22 : Average hourly Wind Speed in 2021 at Sub-Projects (Source: Weather Spark)

The predominant average hourly wind direction at Project area varies throughout the year. The wind direction is most often from the west for 10 months, from January 18 to November 26, with a peak percentage of 93% on May 2. The wind is most often from the north for 1.7 months, from November 26 to January 18, with a peak percentage of 40% on January 1.

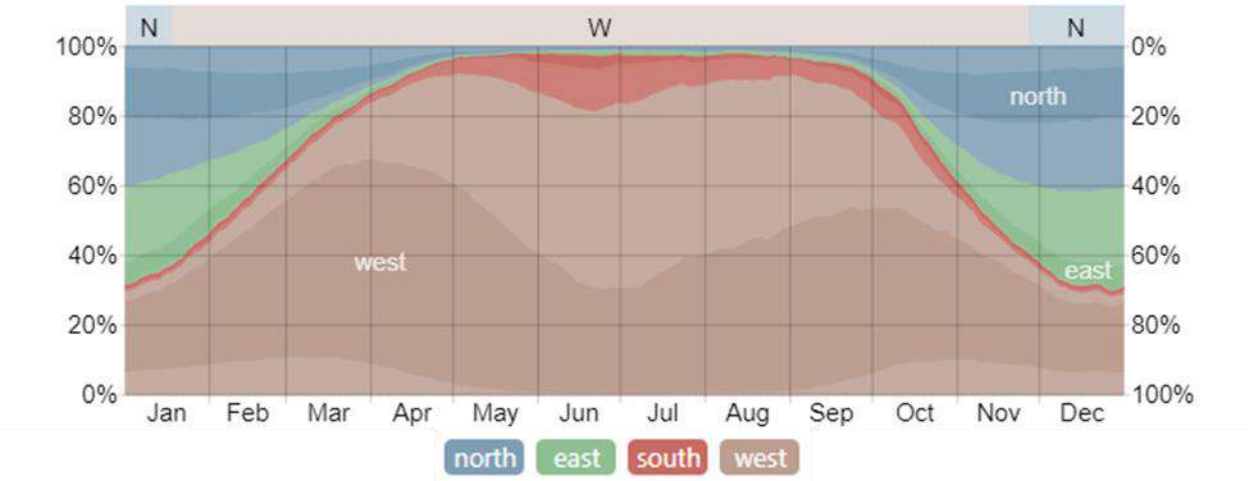


Figure 4-23 : Average Wind Direction at Sub-Project Areas | 2010-2021 (Source: Weather Spark)

4.1.7 Ambient Air Quality and Noise

The prime objective of the baseline air and noise quality study is to establish the existing ambient air quality and noise levels of the subproject area. The air and noise quality assessment were carried out on two locations as shown in Table 4-3

Table 4-3: Air and Noise Quality Sampling Locations for Malir Sub-Projects

S. No.	Code	Latitude	Longitude	Description
Air Quality				
1	M-AN-1	24.88523917	67.18490677	Government Girls Secondary School, Baraf Khana Dr. Fasih's ENT & General Hospital Saudabad Police Station
2	M-AN-2	24.91588187	67.24991933	Crescent Grammar School - Memon Goth NADRA Office - Memon Goth Jamia islamia Eid-Gah Memon Goth Farhat Bagh
M-AN= Ambient Air and Noise				

Figure 4-24: Satellite view of AN-1 and AN-2 sampling locations

The parameters tested for air quality were as per Sind Environmental Quality Standards (SEQS) recommendations that include Carbon Monoxide (CO), Sulfur Dioxide (SO2), Nitrogen Oxide (NO), Nitrogen Dioxide (NO2), Oxide of Nitrogen (NOx), Ozone (O3), Total Particulate Matter (TPM), Particulate Matter (PM10), Lead and noise level. The results of air and noise quality monitoring are shown in Table 4-4. All the air quality parameters and noise levels were within SEQS limits at all sampling locations. All of the air quality parameters are within the permissible limits of SEQS. Hourly results of ambient air and noise quality are attached in Annexure A.

Table 4-4: Air and Noise quality of Malir Sub-Projects

Site	NO (µg/m3)	NO2 (µg/m3)	SO2 (µg/m3)	CO (µg/m3)	PM 2.5 (µg/m3)	PM 10 (µg/m3)	TPM (µg/m3)	O3 (µg/m3)	Noise dB
Madina Chowk, Korangi	0.74	6.99	4.34	0.028	57.4	93.98	182.1	ND*	70.1
Memon Goth, Malir	0.72	6.43	3.13	0.038	55.3	98.2	159	ND	65.3
SEQS	40	80	120	5	75	150	500	130	80

Note: ND= Not Detected
M-AN = Ambient Air and Noise
SEQS= Sind Environmental Quality Standards

Figure 4-25: Air and Noise Quality Monitoring Data Collection at the Field in Malir Neighborhood

4.1.8 Water Sources

4.1.8.1 Surface Water Sources

Figure 4-26: Thado Nala

Malir River and Thaddo Nadi are the only surface water rersources which flow within 3 km vicinity of the Sub-Projects. Thaddo Nala being in a very close proximity to Sub-Project v i.e., 0.63 km away from the start of sub-project road and 2.67 km from the rest of the 4 sub project present in Malir neighborhood. Thaddo Nala and Malir Nadi both have turned to rain-fed stream and now are mostly dumping ground of waste water. Waste Water quality assessment was conducted on a sample collected from Thaddo Nala. Water from Thaddo Nala is still used for Agriculture and livestock feeding in the nearby villages and goths and also dairy farms.

The Malir River basin is the largest basin and source of surface runoff and sediments load in Karachi. The Malir River forms as a result of the confluence of two main rivers the Mol River and the Khadeji River.

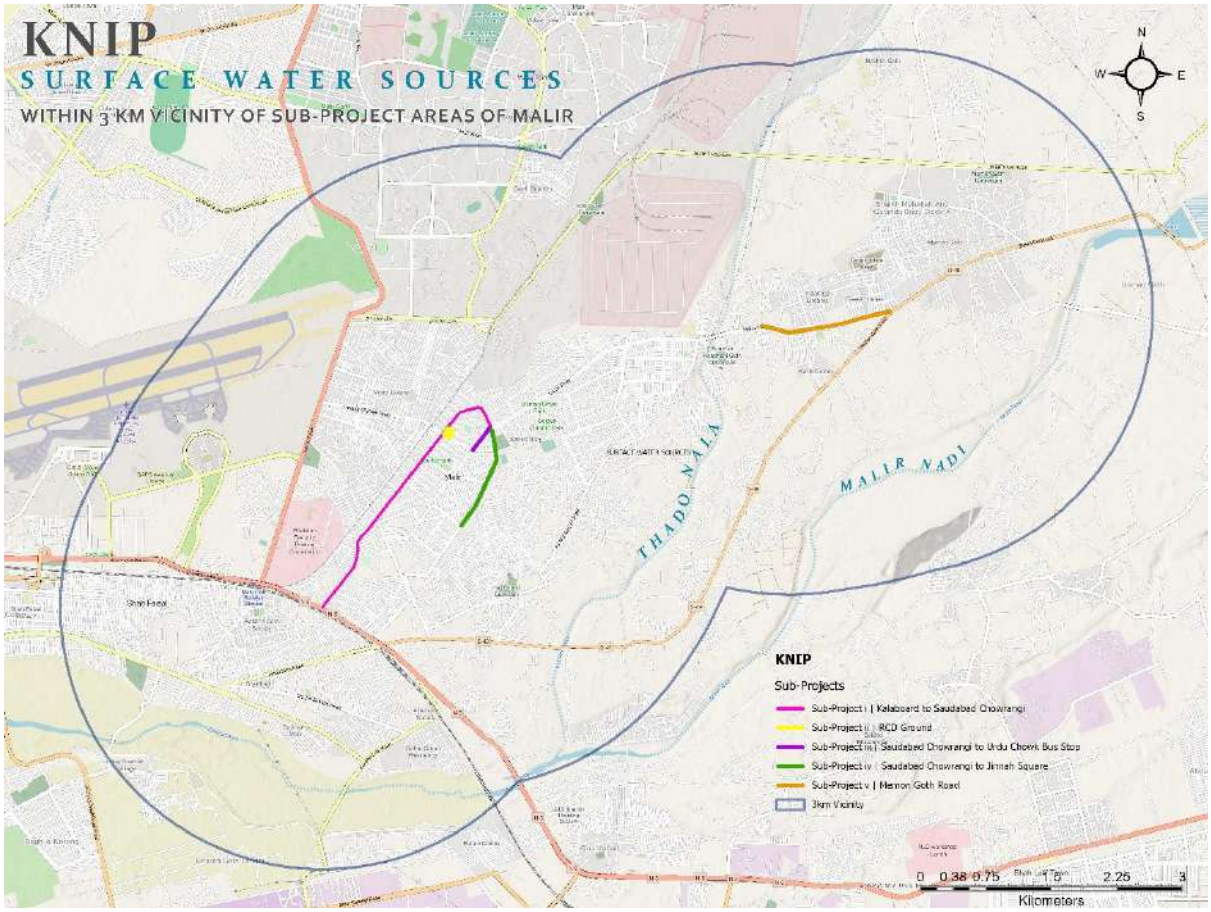


Figure 4-27: Surface Water Sources within 3 km vicinity of Sub-Project areas

4.1.8.2 Storm Water Drain

A storm water drain passes through most of the length of the Sub-Project-i, from Kalaboard to Saudabad Chowrangi on Right side of the road (Figure 4-28). The drain is uncovered at 75 locations while eighty-five (85) Nala tops were spotted on the drain though it remains uncovered through most of its length. The subproject is designed to cater the roadside drain by covering it throughout its length.

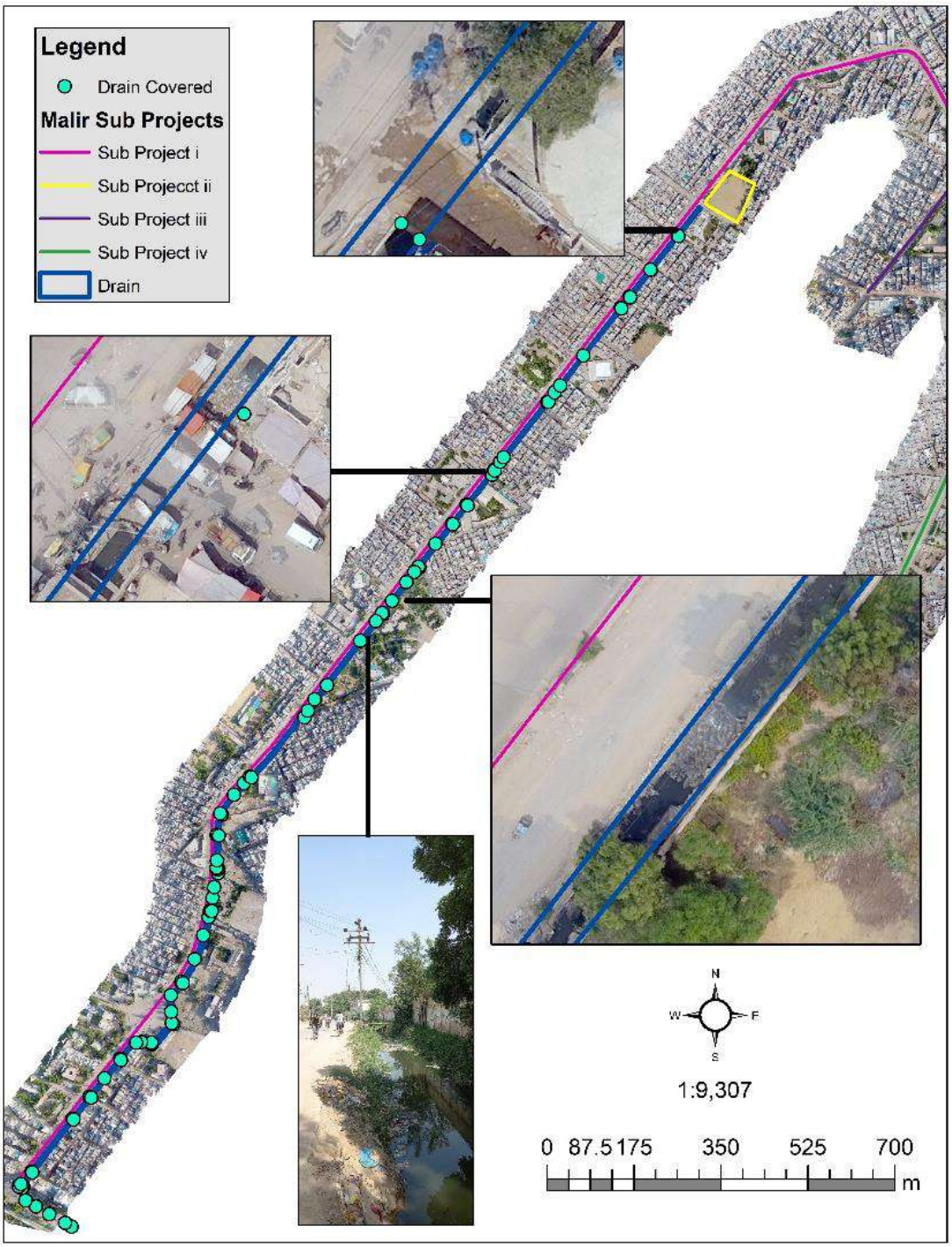


Figure 4-28 : Storm Water Drain passing through Sub-Project-i

4.1.8.3 Ground Water Sources

Malir Tanki is present on the road of Sub-Project-I i.e., road from Kalaboard to Saudabad Chowrangi, which provides drinking water to the neighborhood. Water capacity of Malir Tanki is 400,000 gallons, and supplies water to Saudabad C area, H area, and adjoining areas of Saudabad.

Figure 4-29 : Malir Tanki

The water quality assessment was carried out on two locations (one for groundwater and one for wastewater) in Malir as shown in Table 4-5. The groundwater and wastewater quality assessment were as per SEQS recommendation.

The results revealed that in groundwater sample the parameters including Total Bacteria Count, Total Coliform, E-Coli, Fecal Coliform, Total Dissolved Solid, Total Hardness, Chloride, Nitrate and Nitrite have exceeded levels as compared SEQS. The rest of water quality parameters were within permissible limits (Table 4-6).

In wastewater sample, out of thirty two (32) parameters, sixteen (16) parameters were above than the permissible limits as mentioned in Table 4-7 as pink colour.

Table 4-5: Ground Water and Wastewater Quality sampling Locations for Malir

S. No.	Code	Latitude	Longitude	Description
Water Quality				
1	M-GW-1	24.89462709	67.20067053	Government Polytechnic Institute (Girls), Saudabad, Malir, Karachi
2	M-WW-1	24.91128867	67.22681709	Thado Nala near Memon Goth
GW= Ground Water WW= Wastewater				

Figure 4-30: Satellite view of GW-1 and WW-1 sampling locations

Figure 4-31: Water and wastewater sampling at Malir subprojects

Table 4-6: Groundwater Quality results of site M-GW-1

S #	Parameters	Units	Result	Standard
01	Total Bacteria Count	TBC (count/ml)	TNTC	Must not be detectable in any 100 ml sample
02	Total Coliform	TC (count/ml)	TNTC	Must not be detectable in any 100 ml sample
03	E-Coli Count	EC(count/ml)	TNTC	Must not be detectable in any 100 ml sample
04	Fecal Coliform	FC (count/ml)	TNTC	Must not be detectable in any 100 ml sample
05	Turbidity	NTU	< 0.02	< 5 NTU
06	Taste	Taste	NonObjectionable	NonObjectionable
07	Odour	Odor	NonObjectionable	NonObjectionable
08	Colour	TCU	< 1	< 15
09	Phenolic Compounds	As Phenol (mg/L)	ND	-
10	Residual chlorine	Cl_2 (mg/L)	0.3	0.2 - 0.5
11	pH @ 25 ˚C	pH	7.6	6.5 - 8.5
12	Total Dissolved Solid	TDS (mg/L)	1368	< 1000
13	Total Hardness	As CaCO3(mg/L)	651	< 500
14	Fluoride	F^{-1} (mg/L)	0.89	< 1.5
15	Chloride	Cl^{-1} (mg/L)	382.5	< 250
16	Cyanide	CN^{-1}(mg/L)	ND	≤ 0.05
17	Nitrate	NO_3^{-1} (mg/L)	0.71	≤ 0.50
18	Nitrite	NO_2^{-1} (mg/L)	0.04	-
19	Antimony	Sb (mg/L)	ND	≤ 0.005
20	Aluminum	Al (mg/L)	0.016	≤ 0.2
21	Arsenic	As (mg/L)	ND	≤ 0.05
22	Boron	B (mg/L)	ND	0.3
23	Barium	Ba (mg/L)	0.011	0.7
24	Chromium Total	Cr (mg/L)	ND	≤ 0.05
25	Copper	Cu (mg/L)	<0.02	2
26	Cadmium	Cd (mg/L)	ND	0.01
27	Lead	Pb (mg/L)	ND	≤ 0.05
28	Manganese	Mn (mg/L)	ND	≤ 0.05
29	Mercury	Hg (mg/L)	ND	≤ 0.001
30	Nickel	Ni (mg/L)	ND	≤ 0.02
31	Selenium	Se (mg/L)	ND	0.01
32	Zinc	Zn (mg/L)	0.11	5.0

Note:
TNTC= Too numerous to count
BDL= Below Detection Limit
ND= Not Detected
WL= Within Limit
OL=Out of Limit

Table 4-7: Waste water Quality results of site M-WW-1

S #	Parameters	Units	Result	SEQS Limits
01	Temperature @ 40 ºC	ºC		40+≤03 ºC
02	pH @ 25 ˚C	pH	12.0	6.5 to 8.5
03	Color	TCU	4933	≤ 15 TCU
04	Total Dissolved Solids	TDS (mg/L)	7670	3500
05	Total Suspended Solids	TSS (mg/L)	150	200
06	Chemical Oxygen Demand	COD (mg/L)	3080	150
07	Biological Oxygen Demand	BOD_5 (mg/L)	1100	80
08	Oil & grease	(mg/L)	5.8	10
09	Phenolic compound	As Phenol (mg/L)	35.8	≤ 0.002
10	Anionic detergent	MBAS (mg/L)	1.5	1
11	Total kjeldahl nitrogen	TKN (mg/L)	3.5	1
12	Total phosphorus	TP (mg/L)	1	2
13	Total coliform	TBC (count/ml)	TNTC	0/100 ml
14	Molybdate reactive silica	($mgSio_2$/L)	51	50
15	Chlorides	Cl^{-1} (mg/L)	720	< 250
16	Cyanide total	CN^{-1}(mg/L)	0.05	≤ 0.05
17	Aluminum	Al (mg/L)	0.25	≤ 0.2
18	Copper	Cu (mg/L)	0.30	2
19	Iron	Fe (mg/L)	0.07	2
20	Lead	Pb (mg/L)	0.12	≤ 0.05
21	Silver	Ag (mg/L)	0.05	5
22	Nickel	Ni (mg/L)	0.06	≤ 0.02
23	Zinc	Zn (mg/L)	0.2	5
24	Mercury	Hg (mg/L)	ND	≤ 0.001
25	Chromium	Cr (mg/L)	0.32	≤ 0.05
26	Magnesium	Mg (mg/L)	18.24	2
27	Manganese	Mn (mg/L)	0.45	≤ 0.5
28	Cadmium	Cd (mg/L)	0.02	0.01
29	Barium	Ba (mg/L)	0.05	2
30	Cobalt	Co (mg/L)	ND	2
31	Arsenic	Ar (mg/L)	ND	2
32	Selenium	Se (mg/L)	ND	0.01

Note:
TNTC= Too numerous to count
BDL= Below Detection Limit
ND= Not Detected
WL= Within Limit
OL=Out of Limit

4.1.9 Physical Cultural Resources (PCRs)

A list of archaeological sites protected under Antiquities Act 1975 is presented in “Guidelines of Sensitive and Critical Area developed by Pak-EPA in 1997”. There is a total of 211 archaeological/historical sites, declared as “Protected Heritage” by the Government of Sindh (Under the Sindh Cultural Heritage (Preservation) Act 1994 on September 7, 1995) situated in the Karachi District, out of these none of the archaeological/historical comes within the vicinity of targeted sub-projects.

4.1.10 Sensitive Receptors

The names of Sensitive receptors are listed in the Table 4-5 and shown in Figure 4-32 - Figure 4-34. As confirmed by ESMP Consultant engineer, the project interventions will not touch the said sensitive receptors and there will be no impact on them during construction as they are located at considerable distance from the proposed interventions. However, the assessment of impact on these sites is discussed in Section 6.4.7

Table 4-8 : Sensitive Receptors in Sub-Projects

Education Institutions	Medical Facilities	Mosques and Imam Bargah	Government Institutions
Govt. Girls Secondary School	Nehal Hospital	Hussainia Imamia	Fire Station
Liaquat Govt. College for Girls	Dow lab	Masjid o Imam Bargah Hussaini Sifarat Khana	NADRA Office
Govt. Girls Degree College	Fatima Eye Hospital	Hussainia Imamia	KKF Malir Sard Khana
Govt. Girls Murad Memon School	Dr. Fasih's ENT and General Hospital	Jamia Masjid Madina	SSGC CFC
Govt. College for women	Sindh Govt. Hospital Saudabad	Jamia Masjid Mustafa	KDA Malir Office
Govt. Girls Secondary School	Taha Medicos	Jamia Masjid Qadria Malir	Union Council Office
Institute of Advancing careers and talents	Supreme Diagnostic Labortary	Markazi Jamia Chishtiya Lal Masjid	Model Colony Police Station
The Scholars Academy	Pakistan Health Care Trust Hospital	Tayyaba Masjid	SSGC CFC
Govt. Monotechnic Institute	Tasneem Memorial Hospital	Farooqi Masjid Darul Uloom	KDA Malir Office
Jamia Rasheedia	Dr. Essa Labortary & Diagnostics	Baeza Masjid	
Asif School	DOW lab	Masjid Ali bin Abee Talib	
TCF School	Sindh Medical Centre	Ghausia Masjid	
Government Girls Secondary School	Al-Mustaid Medical Welfare and Educational Centre	Jamia Masjid Hussain and Imam Bargah Darbar-e-Hussain	
		Saudabad Qabristan	

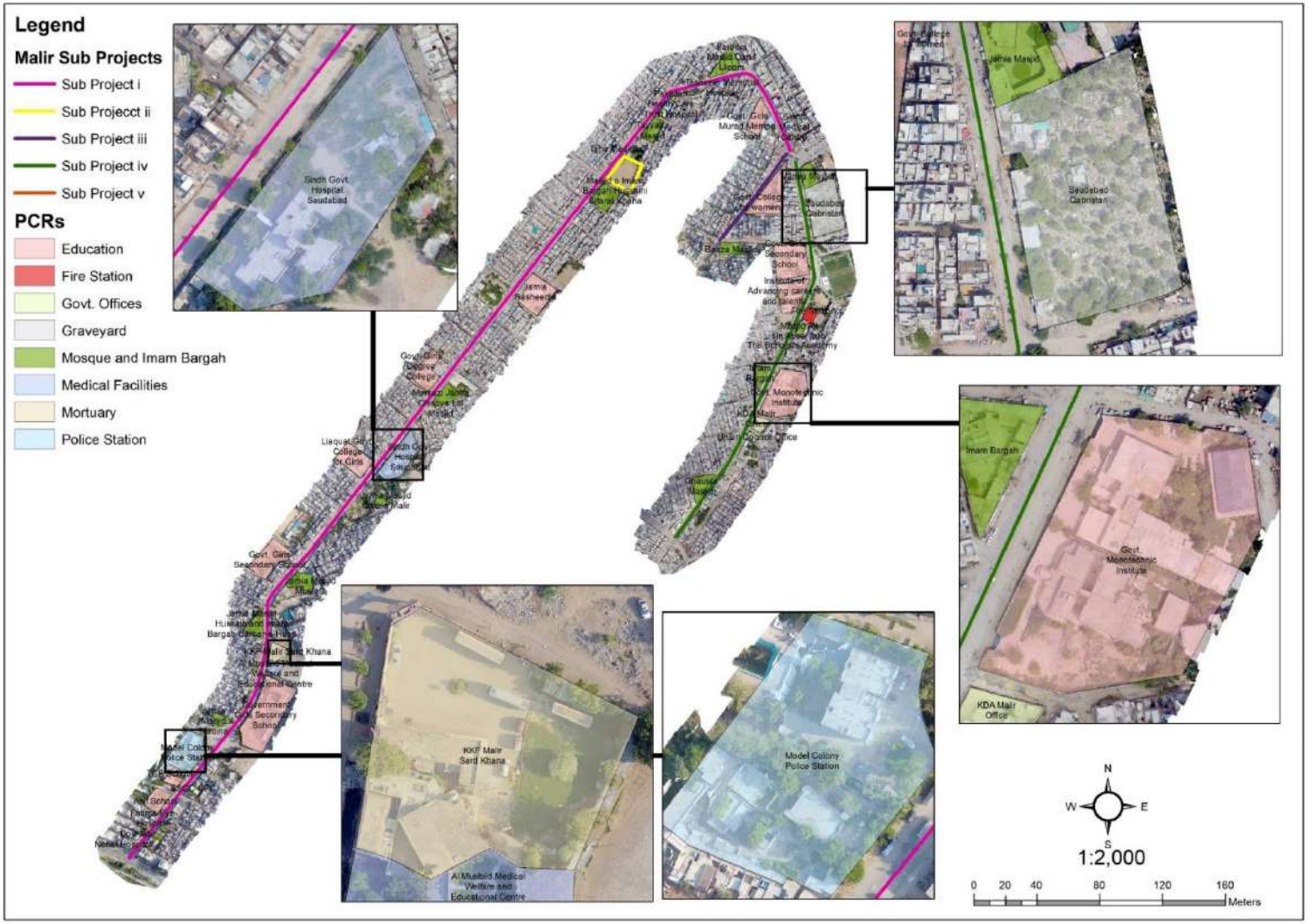


Figure 4-32: Map showing Sensitive Receptors along the Emergency Sub-Projects

Masjid Farooq Azam

Government Monotechnic Institute

Fire Station

Saudabad Qabristan

Government College for Women, Saudabad

Darul Uloom Qadria Rizvia

Figure 4-33: Sensitive Receptors Spotted during Field Survey

Pilot Project – Shelter Home

Police Station

Masjid o Imam Bargah Hussaini Sifarat Khana

Madina Chowk

Figure 4-34: Sensitive Receptors Spotted during Field Survey

4.2 ECOLOGICAL BASELINE

A detailed environmental screening was conducted on the Sub-Projects of Malir Neighborhood and the flora and fauna situated in the line of sight of the Sub-Projects were identifies and are listed down here.

4.2.1 Flora of the Sub-Projects

Total 205 trees were spotted in the five Sub-Projects of Malir as shown in Figure 4-35. Species of all the trees identified are listed in Table 4-9 along with IUCN status. Whereas exotic alien plant species *Conocarpus erectus* is dominant in the region.

Table 4-9: IUCN Conservation Status for Plant Species found in the Project Area

S. No.	Scientific Name	Common Name	IUCN Status
1.	*Aerva javanica*	Desert cotton	LC
2.	*Albizia lebbeck*	Indian Siris	LC
3.	*Alstonia scholaris*	Indian Pulai	LC
4.	*Azadirachta indica*	Neem	LC
5.	*Calotropis procera*	Apple of Sodom/ Aak	NE
6.	*Carica papaya*	Papaya Tree	DD
7.	*Eucalyptus spp.*	Sufaida	NE
8.	*Ficus benghalensis*	Banyan/ Bohr	NE
9.	*Ficus religiosa*	Sacred Fig	NE
10.	*Guaiacum officinale*	Guaiac Wood	NE
11.	*Moringa olifera*	Sohanjna	NE
12.	*Parkinsonia aculeata*	Palo Verde	LC
13.	*Phoenix dactylifera*	Date Palm	LC
14.	*Phragmites karka*	Common reedSarkanda	LC
15.	*Phyllanthus emblica*	Indian gooseberry	LC
16.	*Pithecellobium dulce*	Jungle jalebi	LC
17.	*Plumeria rubra*	Frangipani	LC
18.	*Prosopis cineraria*	Ghaf	NE
19.	*Prosopis glandulosa*	Honey Mesquite	LC
20.	*Prosopis juliflora*	Kikar	NE
21.	*Terminalia catappa*	Badam	LC
22.	*Thespesia populnea*	Portia Tree	LC
23.	*Ziziphus mauritiana*	Beri	LC
24.	*Ziziphus nummularia*	Jujube	NE
Key	NE = Not Evaluated	DD=Data Deficient	
	LC = Least Concerned	NT = Near Threatened	
	VU=Vulnerable	EN = Endangered	
	CR = Critically Endangered	EW=Extinct in the Wild	
	EX=Extinct	RE = Regionally Extinct	

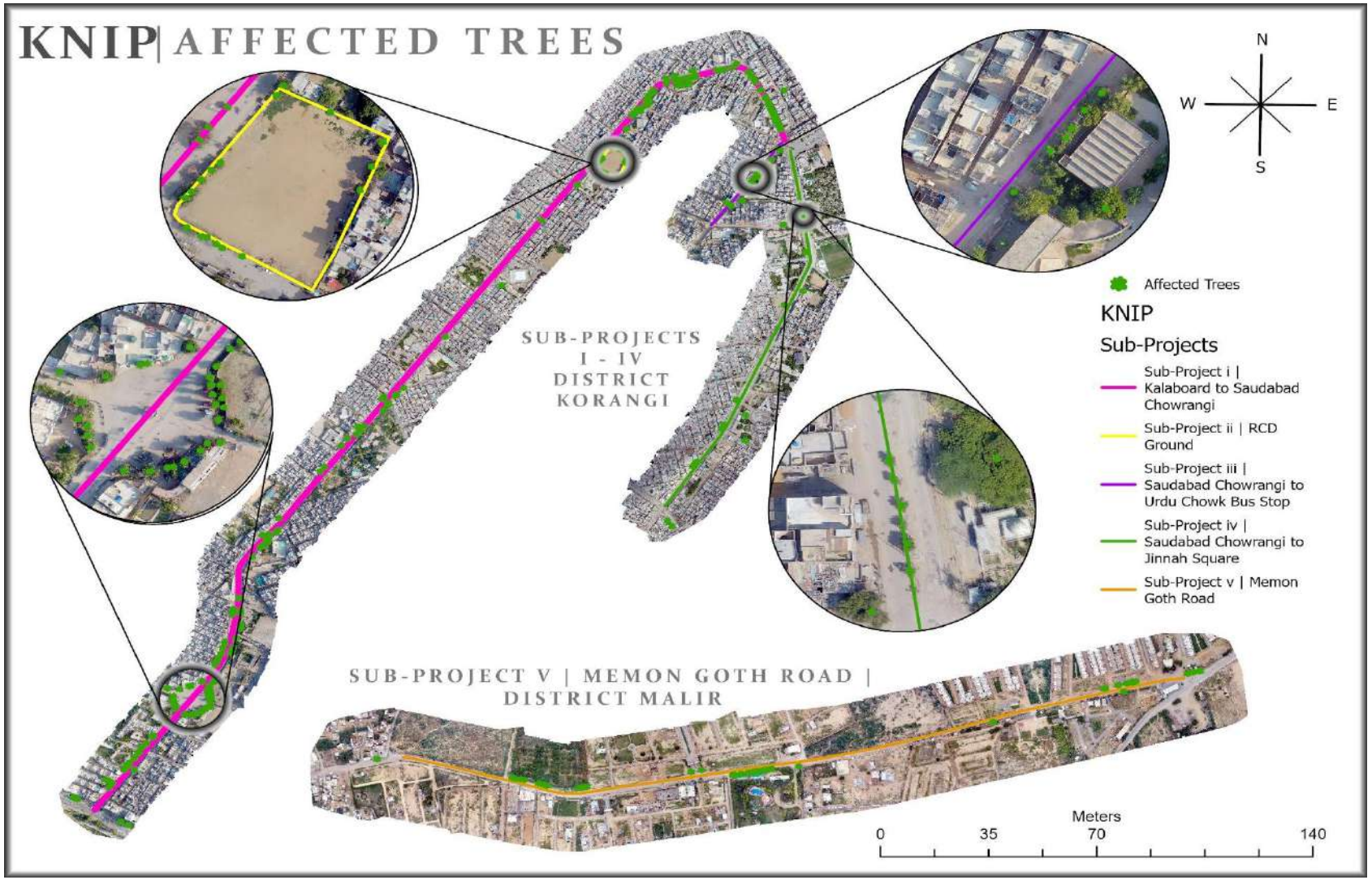


Figure 4-35 Affected Trees in Sub-Projects of Malir Neighborhood

Conocorpus erectus

Mangifera indica

Polyalthia longifolia

Pithecellobium dulce

Alstonia scholaris

Phoenix dactylifera

Moringa oleifera

Ficus religiosa

Figure 4-36: Dominant Flora of Sub-Projects of Malir

Guaiacum officinale

Ficus benghalensis

Azadirachta indica

Cocos nucifera

Prosopis juliflora

Calotropis procera

Eucalyptus globulus

Phragmites karka

Figure 4-37: Dominant Flora of Sub-Projects of Malir

4.2.2 Fauna of the Sub-Projects

There are no established habitats of large and small animals, birds or reptiles within subproject sites. However, the urban fauna, especially invasive bird species were quite dominant, including, *Milvus migrans, Corvus splendens, Herpestes javanicus, Felis domestica*, *Funambulus pennantii, Hystrix indica*, *Bandicota bengalensis*, *Mus musculus, Bubalus bubalis, Bos taurus, Capra aegagrus hircus, Ovis aries, Equus asinus, Bubulcus ibis, Acridotheres tristis* and *Passer domesticus* were few of these fauna species spotted during the ecological screening of the Sub-Projects.

Table 4-10: IUCN Conservation Status for Animal Species found in the Project Area

S. No.	Scientific Name	Common Name	IUCN Status
1.	*Herpestes javanicus*	Mongoose	LC
2.	*Felis domestica*	Cat	LC
3.	*Funambulus pennantii*	Squirrel	LC
4.	*Hystrix indica*	Porcupine	LC
5.	*Bandicota bengalensis*	Bandicoot Rat	LC
6.	*Mus musculus*	House Rat	LC
7.	*Bubalus bubalis*	Buffalo	NE
8.	*Bos taurus*	Cow	NE
9.	*Capra aegagrus hircus*	Goat	NE
10.	*Ovis aries*	Sheep	NE
11.	*Equus asinus*	Donkey	NE
12.	*Bubulcus ibis*	Cattle Egret	LC
13.	*Acridotheres tristis*	Common Myna	LC
14.	*Milvus migrans*	Black Kite	LC
15.	*Corvus splendens*	Common Crow	LC
16.	*Passer domesticus*	House Sparrow	LC
Key	NE = Not Evaluated	DD=Data Deficient	
	LC = Least Concerned	NT = Near Threatened	
	VU=Vulnerable	EN = Endangered	
	CR = Critically Endangered	EW=Extinct in the Wild	
	EX=Extinct	RE = Regionally Extinct	

Equus asinus

Milvus migrans

Bubalus bubalis

Bos taurus

Figure 4-38: Dominant Fauna of Sub-Projects of Malir

Chapter 5. SOCIO-ECONOMIC BASELINE OF EMERGENCY SUBPROJECT AREAS

This section of the report shows the existing Socio-Economic condition of the Emergency Sub-Projects areas, in Malir.

5.1 SOCIO-ECONOMIC PROFILE OF EMERGENCY SUB-PROJECT AREAS

The socioeconomic profile was drafted from the secondary literature resources as well as from the on-ground survey conducted in the emergency sub-projects area including neighborhood. This section outlines the existing situation and condition of shops, denizens, mobile venders, hawkers, public infrastructure, schools, colleges, health departments, labor, employees and desultory public utilizing the sub-project area.

The sub-projects areas are residential cum commercial area. The four roads included in the sub-projects area are used by the residents, institutes, a few public buses, rickshaw drivers, and pedestrians who live in surrounding areas and walk through the sub-projects areas.

A sample of students has also been taken for their basic Socio-Economic information. While some of the students are not residents of the sub-project area, they are regular users of this area. The Socio-Economic profile includes basic information regarding their residence locality, mode of transport from their residence to the sub-project areas, and size of the household.

Other regular users of this area include transport service providers. There are only two roads which have bus routes, while people also use rickshaws as a mode of transport, the number varies during the day. The Socio-Economic survey also includes the profile of a few selected bus and rickshaw drivers.

The Socio-Economic survey also includes a brief profile of a sample of government servants and teachers of educational institutions. The sample was selected based on the availability of teaching staff and government servants.

5.1.1 Demographic profile

According to the demographic profile, Karachi is divided into seven districts. Conferring to census 2017, the current population of Korangi District is 2,457,019 persons. Whereas, in 1998 census, the total population was 1,561,742. Likewise, Malir District holds a population of 2,008,901 as per 2017 contrary to 976,193 persons in 1998. The current sub-projects in Malir areas are part of the Korangi and Malir Districts.

Table 5-1 Administrative Profile of Karachi Division

Administrative Profile of Karachi Division				
	Area (sq.km)	No. of Districts	No. of Union Councils	No. of Mouza
Karachi	3,528	07	178	75
Source: City District Karachi, Pakistan Bureau of Statistics				

The demographic profile of Karachi division is presented in Table 5-2.

Table 5-2 Demographic Profile of Karachi Division, Korangi and Malir Districts

Administrative Units	Rural/ Urban	Households	Population 2017				Population 1998	Sex Ratio 2017	Avg Annual Growth
			Male	Female	Trans gender	All Sexes			
Karachi Division		2,770,074	8,439,659	7,610,365	1,497	16,051,521	9,856,318	110.9	2.6
	Rural	193,871	606,588	534,499	82	1,141,169	407,510	113.49	5.56
	Urban	2,576,203	7,833,071	7,075,866	1,415	14,910,352	9,448,808	110.7	2.43
Korangi District		421,618	1,284,015	1,172,737	267	2,457,019	1,561,742	109.49	2.41
	Rural								
	Urban	421,618	1,284,015	1,172,737	267	2,457,019	1,561,742	109.49	2.41
Malir District		338,257	1,074,282	934,491	128	2,008,901	976,193	114.96	3.86
	Rural	149,820	457,368	400,485	69	857,922	333,942	114.2	5.08
	Urban	188,437	616,914	534,006	59	1,150,979	642,251	115.53	3.11

5.1.1.1 Socio-Economic Profile of Household

The Socio-Economic profile of the household (HH) in the sub-projects area from Saudabad to Kala Board, Saudabad to Urdu Chowk and Saudabad to Jinnah Square is mainly self-owned or rented houses. The HH are living in newly developed apartments on the road from Soomar Kandani to Murad Memon Goth. The Socio-Economic profile of HH was developed from the 20 randomly selected persons who lived in the sub-project areas.

It was observed during the survey of the Socio-Economic profile of the HH, the average size of the HH was above 10 persons in the family. Only 30% of the HH are living in nuclear family while 70% are living in joint family system. The 75% of the HH have self/owned houses while the rest are living on rental basis. According to the survey average earning hands per HH are 4. The average income per HH is between Rs. 26,000-40,000/-. According to the conducted survey only male members of the family are doing job (Private/ Govt.) and some have their own/rented shops in the located area. The following table show the Socio-Economic data:

Table 5-3 Socio-Economic Survey of Households

Socio-Economic Survey of Households								
Respondent	Area	Family Size	No. of Women in HH	Family System	Ownership	Earning Member	Monthly Income	Source of Livelihood
1.	Urdu Chowk Bus Stop	06	04	Joint	Self-owned	01	28,000/-	Trading business
2.	Near UC 05 Korangi District	07	03	Joint	Self-owned	02	26,000/-	Trading business
3.	Jinnah Square	10	06	Joint	Rented	03	28,000/-	Own business
4.	Urdu Nagar Stop	10	05	Joint	Self-owned	02	30,000/-	Private Job

Socio-Economic Survey of Households								
Respondent	Area	Family Size	No. of Women in HH	Family System	Ownership	Earning Member	Monthly Income	Source of Livelihood
5.	Urdu Nagar Stop	08	04	Joint	Self-owned	01	26,000/-	Own business
6.	Murad Memon Goth	10	01	Joint	Self-owned	01	26,000/-	Private Job
7.	Murad Memon Goth	10	06	Joint	Self-owned	02	39,000/-	Private Job
8.	Nade Ali Road	16	03	Joint	Self-owned	01	39,000/-	Private Job
9.	Near UC 05 Korangi District	05	02	Nuclear	Self-owned	03	39,000/-	Govt. Job
10.	Near Jinnah Square	08	03	Joint	Self-owned	02	39,000/-	Own Shop
11.	Near Jinnah Square	07	04	Joint	Self-owned	01	39,000/-	Private Job
12.	Near RCD Ground	11	05	Joint	Self-owned	02	--	Housewife
13.	Near UC 05 Korangi District	05	02	Nuclear	Rented	01	15,000/-	Trading business
14.	Near Jinnah Square	06	02	Nuclear	Self-owned	02	30,000/-	Own Shop
15.	Near Saudabad Chowrangi	07	03	Nuclear	Self-owned	01	32,000/-	Private Job
16.	Near RCD Ground	05	02	Nuclear	Self-owned	01	35,000/-	Trading business
17.	Nade Ali Road	06	03	Nuclear	Rented	01	25,000/-	Private Job
18.	Near RCD Ground	08	05	Joint	Rented	02	26,000/-	Private Job
19.	Near Jinnah Square	10	06	Joint	Self-owned	03	42,000/-	Private Job
20.	Near Jinnah Square	07	04	Nuclear	Self-owned	01	36,000/-	Own Shop

Names of the respondents have not been disclosed due to the confidentiality as per the request of the people, the ESMP is a publicly disclosed document.

5.1.1.2 Socio-Economic Profile of Businesses

The Socio-Economic profile mentioned in this report is of 18 randomly selected shops, mobile hawkers and hawkers in the emergency sub-project areas. The shops and kiosks are located in the sub-projects area, and the sub-project roads is used for their daily commute of shop-keepers.

It was observed during the survey that most of the shops were of residential cum commercial (RCC) structure. The average number of employees per shop is four, 50% of the shop owners owned the shops while the rest are on rental basis. The average income per shop is up to Rs. 30,000-40,000/-. The following table shows the Socio-Economic data:

Table 5-4 Socio-Economic Survey of Businesses

Socio-Economic Survey of Businesses						
Respondents	**Address**	**Type of Business**	**No. of Employees**	**Ownership of Shop**	**Type of Structure**	**Monthly Income**
1.	Urdu Nagar Bus Stop	General Store	03	Owned	Pacca	40,000/-
2.	Urdu Nagar Bus Stop	Mobile hawker	02	Owned	Kiosk	14,000/-
3.	Near Jinnah Square	Electronics	02	Rented	Pacca	25,000/-
4.	Near Jinnah Square	Bakery	04	Rented	Pacca	40,000/-
5.	Near Jinnah Square	General Store	01	Rented	Pacca	20,000/-
6.	Jinnah Square Chowrangi	Sweets & Bakers	05	Owned	Pacca	45,000/-
7.	Near RCD Ground	Electronics	01	Rented	Pacca	25,000/-
8.	Near RCD Ground	Paint Shop	01	Owned	Kiosk	13,000/-
9.	Near Jinnah Square	Mechanic	02	Owned	Semi-Pacca	12,000/-
10.	Nade Ali Road	Mobile Shop	01	Rented	Pacca	30,000/-
11.	Nade Ali Road	Mechanic	02	Owned	Pacca	27,000/-
12.	Nade Ali Road	Easy Load Shop	01	Rented	Pacca	16,000/-
13.	Saudabad to Kala Board	Asian Fan Shop	02	Owned	Pacca	40,000/-
14.	Saudabad to Kala Board	Pakwan Center	03	Rented	Pacca	60,000/-
15.	Saudabad to Kala Board	General Store	02	Owned	Pacca	50,000/-
16.	Saudabad to Kala Board	Bakery	03	Owned	Pacca	45,000/-
17.	Saudabad to Kala Board	Fan Shop	03	Rented	Pacca	42,000/-
18.	Saudabad Chowrangi	Selling Fruits	01	Owned	Kiosk	20,00/-

Names of the respondents have not been disclosed due to the confidentiality of as per the request of the people, the ESMP is a publicly disclosed document.

5.1.1.3 The Socio-Economic Profile of Students

The Socio-Economic survey profile of students is given in the table below:

Table 5-5 Profile of Students in the Sub-Project area

Profile of Students in the Sub-Project area					
Respondent	**Gender**	**Grade**	**Location of Residence**	**Mode of Transport**	**Family Members**
Liaquat Govt. College for Girls					
1.	Female	B. SC Part 2	Bachal Goth Malir	Private	05
2.	Female	B. SC Part 2	Saudabad	Public transport	10
3.	Female	B. Com Part 2	Quaidabad	Private	07
4.	Female	B. A Part 2	Model Colony	Public Transport	09
5.	Female	B. A Part 1	Khoprapar	Private	07
Govt. Girls Secondary School					
6.	Female	HSC Part 1	Christian Colony	Public Transport	06
7.	Female	HSC Part 1	Khoprapar	Private	07
8.	Female	HSC Part 1	Quaidabad	Public Transport	06
9.	Female	HSC Part 2	Model Colony	Private	04
10.	Female	HSC Part 2	Kala Board	Private	07
Govt. Girls degree Arts & Commerce College					
11.	Female	B. A part 1	Khoprapar	Public	09
12.	Female	B. Com part 2	Model Colony	Public	06
13.	Female	B. Sc part 1	Quaidabad	Private	04
14.	Female	B. Com part 1	Madina Chowk	Private	05
15.	Female	B. A part 2	Christian Colony	Public	04
Govt. Degree Girls College					
16.	Female	HSC part 1	Saudabad	Private	08
17.	Female	B. A part 1	Kala Board	Public	04
18.	Female	B. A part 2	Khoprapar	Public	06
19.	Female	B. Com part 2	Model Colony	Private	03

Names of the respondents have not been disclosed due to the confidentiality as per the request of the particpants, the ESMP is a publicly disclosed document.

The above information shows the students in these institutions are from different areas of the city, majority use the private transport while the rest use the public transport in the sub-project area.

5.1.1.4 The Socio-Economic profile of Teachers, Transporter and Local Govt. Employee

Liaquat Government College for Girls

Table 5-6 Socio Economic Profile of Liaquat Govt. College Girls

Respondent	Gender	Designation	Income (PKR)	Residence	Family members	Mode of Transport
1.	Male	Teacher	42,000/-	Shah Faisal Colony	05	Private
2.	Female	Teacher	45,000/-	Husainabad	07	Public/ Private
3.	Female	Teacher	40,000/-	Kala Board	08	Private
4.	Female	Teacher	45,000/-	Model Colony	04	Private
5.	Female	Principal	Not disclosed	Malir Cantt	05	Private

Names of the respondents have not been disclosed due to the confidentiality as per the request of the people, the ESMP is a publicly disclosed document.

Transporters

Socio-Economic profile of the transporters found in the table below:

Table 5-7 Socio-Economic profile of the transporters

Respondent	Gender	Designation	Income (PKR)	Residence
1.	Male	Bus Driver	40,000/-	Korangi
2.	Male	Bus Driver	43,000/-	Landhi
3.	Male	Rikshaw Driver	20,000/-	Madina Chowk
4.	Male	Rikshaw Driver	13,000/-	Malir

Local Government Servants

Table 5-8 Socio-Economic profile of the Local Government Servants

Respondent	Gender	Designation	Income (PKR)	Residence	Family members	Mode of Transport
1.	Male	KMC Employee	12,000/-	Kala Board	06	Public

Names of the respondents have not been disclosed due to the confidentiality as per the request of the people, the ESMP is a publicly disclosed document.

5.1.2 Existing Land Use

Existing land uses of the emergency sub-project areas include educational Institutions, Mosques and Imam Bargah, graveyard, government institutions, recreation grounds, commercial and residential areas, mixed land use and medical facilities. The areas with commercial and mixed commercial plus residential activities are identified on the Figure 5-3.

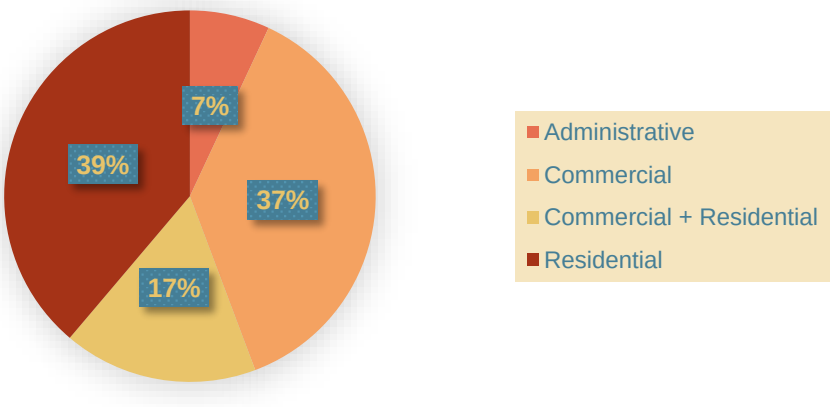


Figure 5-1 Percentage wise distribution of Land Use type

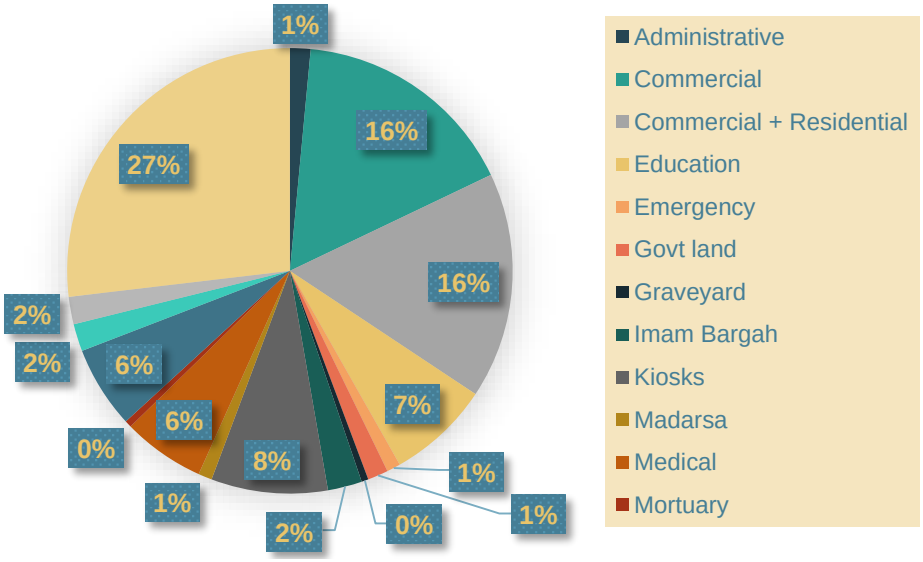


Figure 5-2 Percentage Wise distribution of Existing Land Use

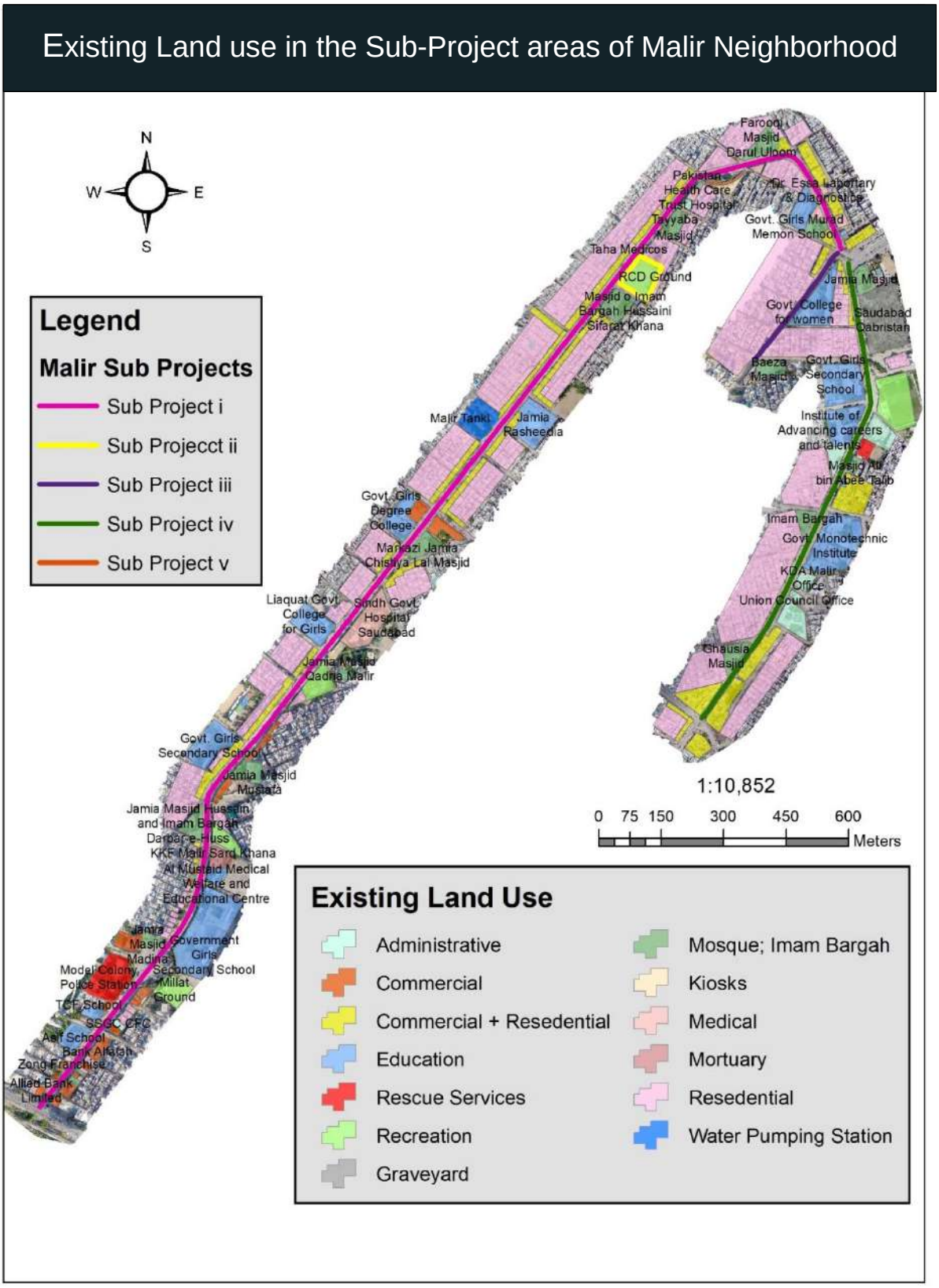


Figure 5-3 Existing Land use of the Sub-Project areas

5.1.3 Gender

According to the survey most of the female residents living in surrounding localities are housewives. Female student population in educational institutions is 45% (Table 5-10) of the educational institutes existing in the Emergency Sub-Project areas. Most of the educational institutions mentioned in Table 5-10 which are located on the road from Saudabad Chowrangi to Kala Board. The schools and colleges are for women mostly on this road, which clearly indicates gender diversity. Most of the educational institutions are offering two shifts (morning and evening).

The survey reveals that public and private transport is accessible to most of the females of the area in the form of buses and rickshaws. Only two roads have bus routes while on the other two roads there are no bus routes, only rickshaws and private transport is used. The bus stops are available but there is no section specially allotted to female users. Most of the females are pedestrians but the sub-project area lacks basic infrastructure for pedestrians like sidewalks, footpaths, and pedestrian bridges.

5.1.4 Poverty

The poverty profile of the Socio-Economic survey was developed considering residents and business community living and working in the emergency sub-project areas. It was observed during the survey that the income of the HH and shops is above Rs.13, 000/- (poverty line). According to the conducted survey, no unemployed HH heads were found. The residents of the area profiled in the Socio-Economic survey, fall in the income category which is above the poverty line. As per aerial imagery, Kiosks cover 2401.03 sqm of the five sub-projects areas of the Malir neighborhood, while semi-pucca households cover 3550.49 sqm of the sub-projects.

5.1.5 Health Conditions

Health issue of the Emergency Sub-Projects is mainly due to the rising sewerage and the sanitation situation of the areas. Solid waste disposal is the major problem observed, and the residents breathe in very toxic and polluted air. The unbearable smell causes various diseases related to the respiratory system. An unhealthy environment is the cause of diseases like dengue and malaria. Another serious problem of these areas is lack of the availability of water *and the* quality *of available water is very deteriorating. D*ue to the poor quality of the water, hepatitis C is another disease caused among the locals.

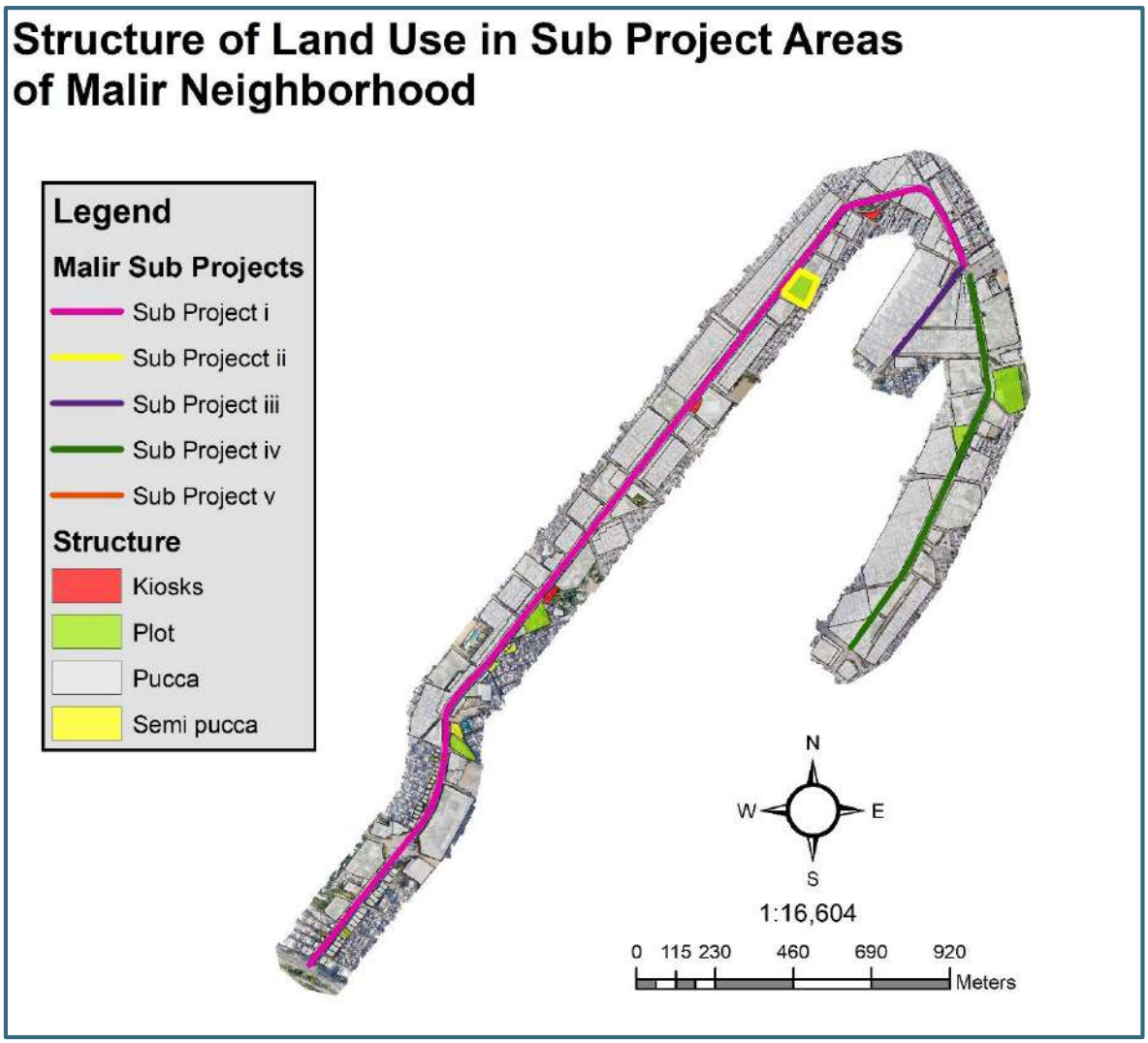


Figure 5-4 Structural Land use in the Sub-Project Areas of Malir Neighborhood

5.1.6 *Katchi Abadi*Slums

According to the Socio-Economic survey, there were no *Katchi Abadis* (Slums) or villages on the targeted roads of the emergency sub-project areas.

5.1.7 Security & Law and Order Situation

It was observed during the Socio-Economic survey that there is adequate security, and the law order situation is under control in the sub-project area due to the presence of police station. The area is serviced by the local police mobiles patrolling to ensure the security of people living in the emergency sub-project areas.

5.2 INFRASTRUCTURE PROFILE

5.2.1 Healthcare Facilities

. There are 12 healthcare facilities including small dispensaries in the sub-projects areas, which provide free of cost services. The details are following:

Table 5-9 Healthcare Facilities

S. No	Facility	Location
1.	Nehal Hospital	Kala Board
2.	Fatima Eye Hospital	Saudabad Chowrangi to Kala Board
3.	Dr. Fasih's ENT and General Hospital	Kala Board
4.	Sindh Govt. Hospital Saudabad	Saudabad Chowrangi to Kala Board
5.	Taha Medicos	Saudabad Chowrangi
6.	Supreme Diagnostic Laboratory	Saudabad Chowrangi
7.	Pakistan Health Care Trust Hospital	Saudabad Chowrangi
8.	Tasneem Memorial Hospital	Saudabad Chowrangi
9.	Dr. Essa Laboratory & Diagnostics	Saudabad Chowrangi to Kala Board
10.	DOW Lab	Kala Chowrangi
11.	Sindh Medical Centre	Saudabad Chowrangi
12.	Al Mustaid Medical Welfare and Educational Centre	Saudabad Chowrangi to Kala Board

Figure 5-5 Medical Facilities in the Sub-Project Areas

5.2.2 Education Facilities

Educational facilities in the Malir Emergency Sub-Project areas are very limited and average except Saudabad Chowrangi to Kala Board Road. TCF on this road is well-equipped with airy and well-lit classrooms, an administrative block, and spacious areas for a stimulating learning environment. Availability and access to primary and secondary levels of education are provided in most sub-projects areas. However, there is an urgent need to provide Bachelor's level education because the sub-projects areas lacks the provision of universities. There are 12 educational institutes located in the Malir Emergency sub-project areas. The details are following:

Table 5-10 Educational Institutes located in the Sub-Project areas

S. No	Facilities	Location
1.	Govt. Girls Secondary School	Saudabad Chowrangi
2.	Liaquat Govt. College for girls	Kala Board
3.	Govt. Girls Degree College	Saudabad Chowrangi
4.	Govt. Girls Primary School	Saudabad Chowrangi
5.	Govt. Girls Murad Memon School	Saudabad Chowrangi
6.	Govt. College for Women	Saudabad Chowrangi
7.	Institute of Advancing Careers and Talents	Jinnah Square
8.	The Scholars Academy	
9.	Govt. Monotechnic Institute	Nade Ali Road
10.	Asif School	Saudabad Chowrangi to Kala Board
11.	Al Mustaid Medical Welfare and Educational Centre	Saudabad Chowrangi
12.	The Citizens Foundation School - TCF	Saudabad Chowrangi to Kala Board

Figure 5-6 Educational Facilities in the Sub-Projects

5.2.3 Water Supply

The existing map of water pipelines provided by KW & SB is shown in Figure 5-7 *and Figure 5-8*. In the proposed design, the water lines of Kala Board to Saudabad sub-project and Saudabad to Nade Ali road up to Jinnah Square will be replaced as per the consultation with

the KW & SB. The replacement of old damaged lines with the new ones, water supply will be improved as compared to the existing situation. The per capita water demand in sub- project areas is 34 gallons per day hence, the daily water demand in Korangi district is 87,636,904 gallons per day.

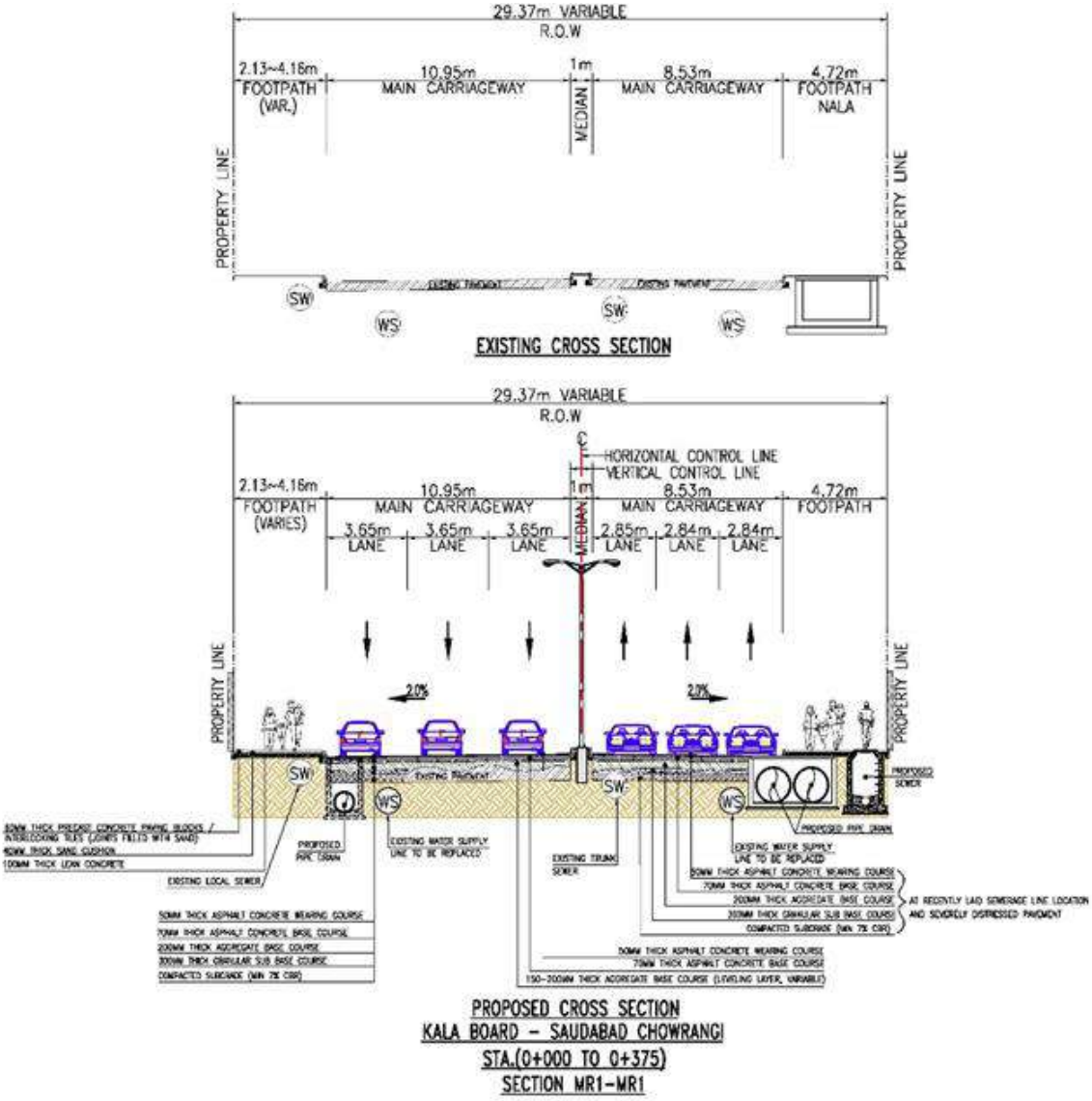


Figure 5-7: Existing and proposed water supply and sewerage system from Saudabad Chowrangi to Kala Board

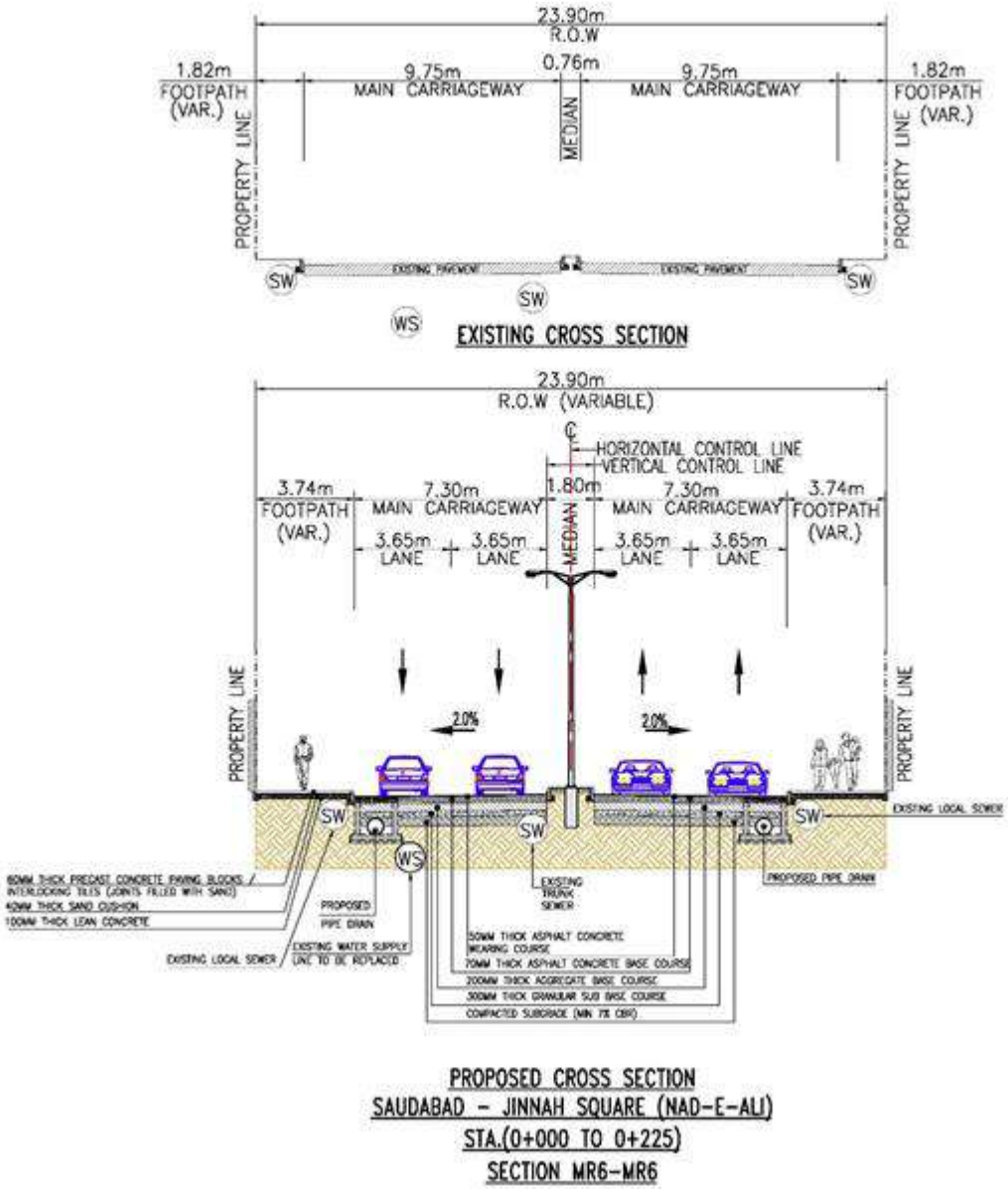


Figure 5-8: Existing and proposed water supply and sewerage system from Saudabad Chowrangi to Jinnah Square

5.2.4 Sewerage and Sanitation

The placement observed of existing and proposed (Interconnections) of the Sewerage system of Model Zone shows that all the bulk/ main trunk lines are recently laid so there is no need of the replacement, only cleaning by the winching machine is proposed by the KW & SB of the sub-project areas.

The new separate sewer line along with the existing Nala at Kala Board to Saudabad road to segregate the sewerage from stormwater has been proposed in the concept design is shown in Figure 5-7 and *Figure 5-8*. .

5.2.5 Solid Waste Management in the Emergency Sub-Project Area

The Solid Waste Management for the whole city is now under the supervision of Sindh Solid Waste Management Board (SSWMB). They have already started placing dustbins all over the city and doing front end collection from generation points to landfill sites. The proposed scheme for solid waste collection has been undertaken by the Municipal Commissioner (DMC Korangi), and the private contractor will be hired for the solid waste collection of the sub-project areas.

Figure 5-9 Solid waste management situation in the Sub-Project Areas

As per the analysis of interviews conducted from households and shop owners, the cleanliness near the dustbins is required at frequent intervals and regular lifting of the solid waste should be increased. Furthermore, street sweeping is not undertaken at most roads of the Malir Emergency sub-projects areas due to improper sewerage system except for the road of Saudabad Chowrangi to Kala Board, where workers of SSWMB were seen at different intervals during the day to collect the solid waste from the dustbins and roadside areas starting from early in the morning, in the mid-afternoon and then in the evening.

5.2.6 Parking Facilities in the Sub-project area

There is no proper parking facility in the area, however, there are some parking spaces available on Nad-e-Ali road near Sport Stadium which has been regularized in the proposed design. There is some additional parking areas planned for a residential block along Soomar Kandani to Murad Memon Chowk Road (Figure 5-10).

Figure 5-10 Existing Parking Space alongside Murad Memon Goth Road

5.2.6.1 Traffic volume

Substantial traffic volume was observed in the project area in peak hours. Traffic volume graphs showing the Traffic Volume Survey results which illustrate motor-bike as the most commonly used medium of transportation in sub-project areas. The frequency of each vehicle was monitored on hourly basis. The condition of roads along with the attitude of commuters were the main factors creating resistance in the flow of the traffic. The vehicles with least number of frequencies were heavy trucks and loaders. The blue line indicates the frequency of motorbikes against each timeslot. While the orange line indicate the flow of cars and grey indicating Rickshaws. The rest of vehicles passed by sub-project areas very occasionally.

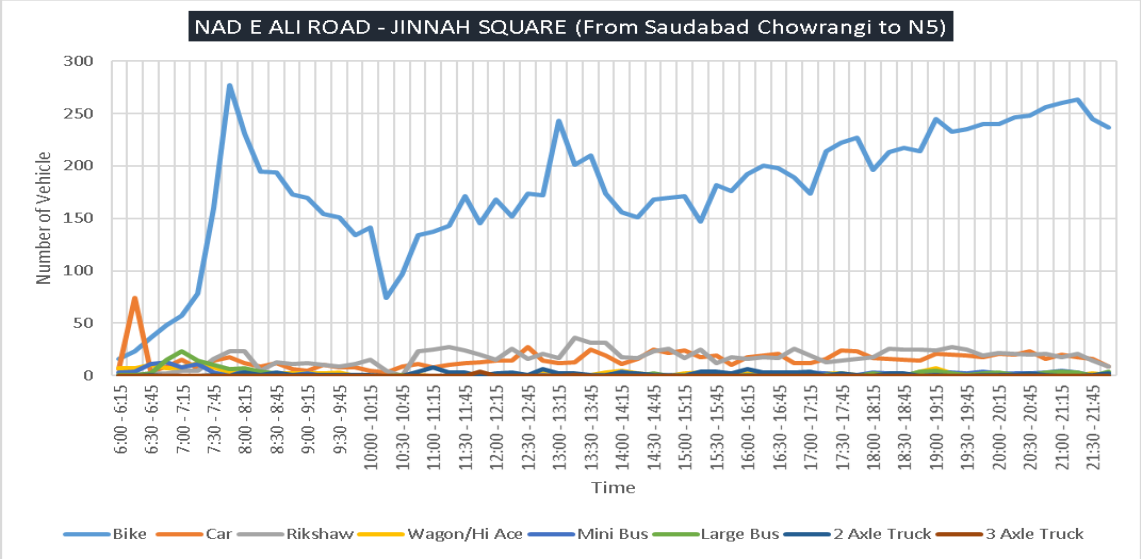


Figure 5-11 Traffic volume from Saudabad Chowrangi to N5

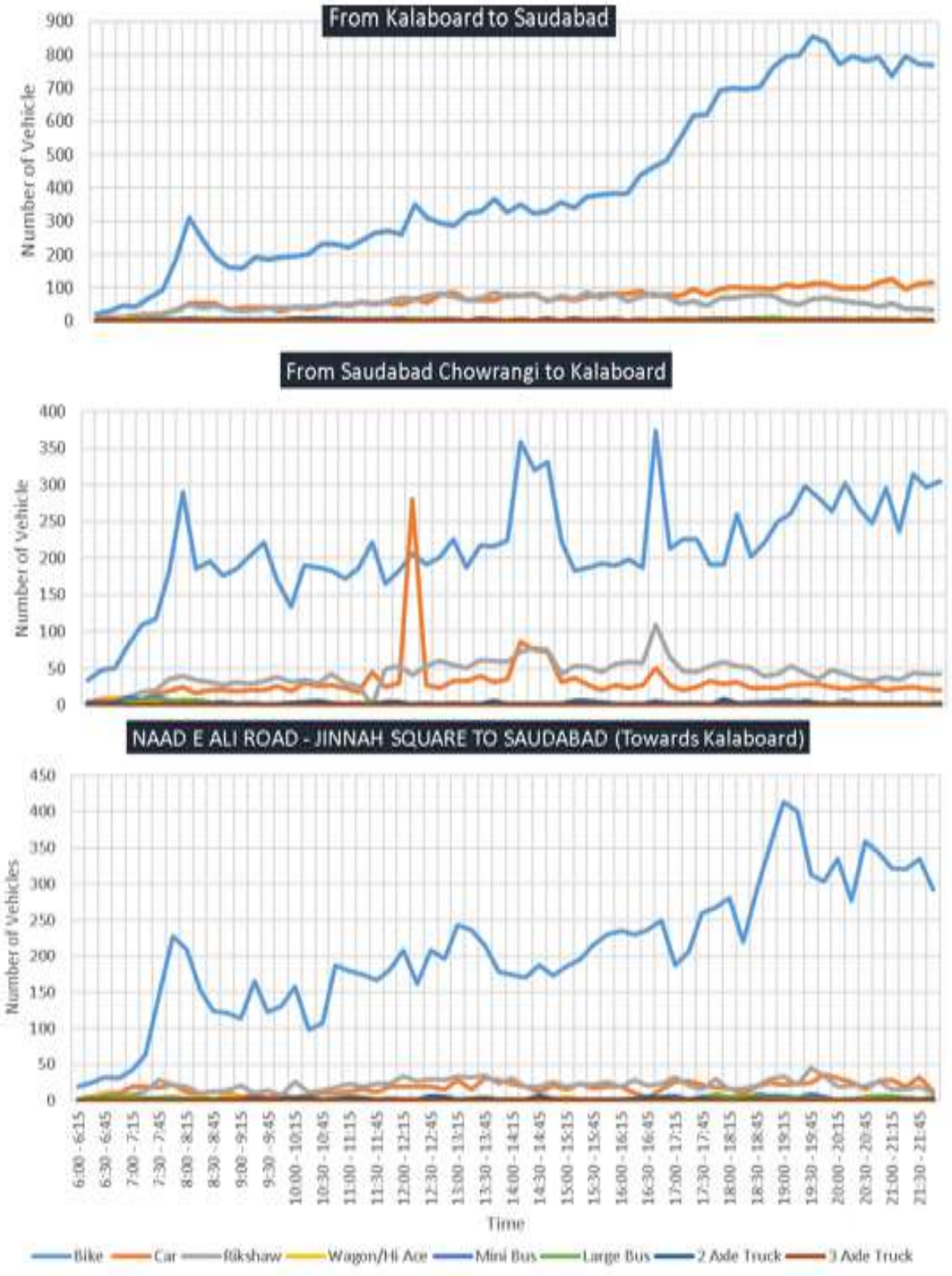


Figure 5-12: Traffic volume (a) from Kalaboard to Saudabad, (b) from Saudabad Chowrangi to Kalaboard and (c) from Naad e Ali Road – Jinnah Square to Saudabad

5.2.6.2 Public transport

The bus stops developed by the government are deficient in numbers in the Malir Emergency sub-projects areas and were mainly found on the road from Saudabad Chowrangi to Kala Board. Some of the main bus stops and routes are depicted in the table below:

Table 5-11 Public Transport in the Sub-Project Areas

Bus Number	Route Name	Main Bus stops in subproject area
F-1	Saudabad to Nasir colony	Tanga Stand
45-A	Khokrapar to Shershah hub river road	Saudabad Square, Nade Ali, Liaquat Suare
UTS -12	Khokrapar to Tower	Khoprapar no. 2, Urdu Chowk, Baraf Khana
UTS-13	Khokrapar Surjani Town	Khoprapar no. 2, Liaquat road, Urdu Chowk, Malir Kala Board
Source: http://karachiroutes.blogspot.com/2012/10/karachi-bus-routes.html https://www.travel-culture.com/pakistan/bus-routes-in-karachi.shtml		

Chapter 6. IMPACTS AND MITIGATION

This chapter analyzes the potential environmental and social impacts of the proposed sub-projects interventions on environment and people of the neighborhood. Specific Mitigation measures are also described to minimize any potential negative impacts, ensuring the compliance of sub-project interventions within the acceptable levels and do not cause any negative environmental and social impacts.

6.1 ENVIRONMENTAL & SOCIAL SCREENING CHECKLIST

The rapid assessment Environmental checklist as presented in project ESMF is used here and divided in two parts i.e.

A. Project Siting
B. Potential Environmental and Social Impacts

Table 6-1: rapid assessment Environmental checklist

	Screening Questions	Yes	No	Remarks
A	**Project Siting**			
1.	Presence of any environmentally sensitive areas? (This aspect will be confirmed for each individual sub-project under KNIP)		✓	
2.	Protected area		✓	
3.	Wetland		✓	*Thaddo* River found within 3 Km range of the Memon Goth Subproject area (sub-project v), not fall in the sub-project area. 
4.	Mangrove		✓	
5.	Estuarine		✓	
6.	Buffer zone of protected Area		✓	
7.	Special Area for protecting biodiversity		✓	

	Screening Questions	Yes	No	Remarks
8.	Physical Cultural Resource/Heritage sites		✓	
B	**Potential Environmental and Social Impacts**			
9.	Noise and dust from construction activities? (This aspect will be assessed while designing specific subprojects. It will be ensured that the noise/dust emissions from subprojects construction remains within acceptable limits.)	✓		Noise and dust from construction activities will be monitored and mitigated with proposed and appropriate mitigation measures.
10	Alteration of surface water hydrology of waterways? (This aspect will be confirmed for each Individual sub-project)	✓		Surface water hydrology will not be affected by the proposed subprojects. Instead, the existing open drain will be covered in subprojects implementation.
11	Aggravation of solid waste problems in the area? (This aspect will be assessed while designing Specific subprojects. It will be ensured that solid waste generated from sub-projects will be handled carefully and disposed in environmental friendly way while avoiding contamination to local waterways and groundwater.)	✓		The solid waste problem is already severe in most of the subproject areas of Malir. There are nine (09) formal garbage dumping sites while several informal ones in the subproject areas. Subproject implementation will certainly help neighborhood to cater this critical issue. 
12	Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters? (This aspect will be confirmed for each individual sub- project and its water requirements. If applicable, the subproject design will include water conservation practices and less water consuming designs)		✓	No such impact is anticipated as water tankers will be used for the source of water and no existing water resources will be used during construction
13	Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes		✓	The subprojects contain unattended garbage heaps which are already the potential breeding grounds of vector borne diseases.

	Screening Questions	Yes	No	Remarks
	and rodents? (It is likely that due to project interventions, the water may accumulate at one place or waste disposal is not adequate. The subproject design will include mitigation measures for proper waste management.			However, sub-project i,ii, iii and iv is aimed at rehabilitation of the area and will involve cleaning of garbage and covering of drain so it will reduce the issue of disease spread in the nearby communities. No heaps of garbage were located at sub-project v.
	     			
14	Inadequate protection of sewage collection, leading to pollution of water supply? (It is likely that due to project interventions, the existing water supply may get contaminated. The subproject design will include mitigation measures for proper waste disposal and wastewater treatment.	✓		The existing conditions of sewage collection is already on the brink. Mitigation measures of existing and produced waste disposal will be ensured in subproject implementation.
15	Dislocation or involuntary resettlement of people? (This aspect will be confirmed for each individual sub- project using involuntary resettlement checklist which will be part of RPF)		✓	No such impact is expected as the sub-project works are within available Right of Ways.
16	Disproportionate impacts on the poor, women and children, elders Indigenous Peoples or other vulnerable groups.		✓	The impacts of the sub-projects are likely to be uniform in all five location of sub-projects.
17	Hazardous driving conditions where construction interferes with	✓		Driving conditions might be crucial during construction phase of the subprojects. Most

	Screening Questions	Yes	No	Remarks
	pre-existing roads? (It is most likely that project interventions may create hazardous driving condition due to diversions and road closure)			important and critical impact will be on the mobility of the emergency vehicles. One (01) fire station and One (01) police station is located on the road of subproject I and iv respectively. Mobility of Fire brigades and Police vehicles will be ensured during construction phase through proper mitigation measures. Traffic Management Plan is annexed.
	  			
18	Increased noise and air pollution resulting from traffic volume? (It is most likely that project interventions may increase air and noise pollution due to diversions and road closure)	✓		During construction phase the subprojects will be temporary affected with air and noise pollution due to traffic diversions. The impact will be monitored and mitigated with proposed mitigation measures.
19	Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? (Unlikely, however this aspect will be confirmed for each individual sub-project)		✓	No such impacts will be projected for the subprojects as the area is far away from city center
20	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 commencement? (Unlikely, however this aspect will be confirmed for each individual sub-project)	✓		It is envisaged that during rehabilitation and up-gradation of subproject road, safety risks will be there for the commuters and community members using the road. It will be ensured that construction site is appropriately cordoned off with hard barricade while also providing safe access to adjacent areas. However, after construction, the improved road will provide safety features and pedestrian crossings which are absent on the existing road and does not involved any elements where their failure can result in injury to the community.

	Screening Questions	Yes	No	Remarks
				N

6.2 ASSESSMENT OF POTENTIAL IMPACTS

6.2.1 General Outline and Scope

Several potential environmental and social impacts of the sub-projects were identified during the scoping phase of the ESMP process. This section provides an analysis of the potential impacts on the physical, biological and Socio-Economic environment of the sub-projects area during the planning/design, rehabilitation/construction and operation/maintenance phases of the proposed sub-projects. Impacts have been identified on the basis of the information presented in previous chapters. In addition, thorough rapid environmental assessment, literature review, primary and secondary baseline data, and expert judgement were carried out for the screening of potential impacts. To reduce, minimize or compensate for the identified potential impacts of the proposed sub-projects, mitigation measures have been proposed. Environmental impacts were considered not only in relation to the road ROW, but also in relation to the areas related to the proposed sub-projects.

6.2.2 Impact Assessment Methodology

For the purpose of evaluating the environmental impact of these proposed sub-projects, the following steps have been executed:

- Scoping of impacts;
- Environmental screening;

Each of these steps undertaken for the evaluation of environmental impacts and to describe mitigation measures, is described in the following section.

6.2.3 Scoping of Impacts

Potential environmental impacts of the sub-projects area are identified through the following manner:

- Environmental quality baseline monitoring of air, noise and water;
- Detailed review and analysis of primary and secondary data available for all environmental parameters in sub-projects area such as physical, biological and Socio-Economic conditions;
- Desktop study of engineering investigations, studies and designs;
- Consultations with implementing agencies, local government, affected community, traditional and religious leaders of community;
- Stakeholder consultations with relevant government agencies and affected families; and
- Knowledge assimilation of international best practices on environmental assessment of roads projects[9].

[9] Chris Joseph, Thomas Gunton & Murray Rutherford (2015) Good practices for environmental assessment, Impact Assessment and Project Appraisal, 33:4, 238-254, DOI: 10.1080/14615517.2015.1063811

6.3 SOCIO-ECONOMIC PLANNING AND DESIGN PHASE IMPACTS AND MITIGATION MEASURES

Following is the brief description of impacts envisaged and the recommended mitigation measures during Planning and Design Phase. All the impacts can be avoided at planning phase hence no residual impact exist.

6.3.1 Topography

No new construction is anticipated in these sub-projects since rehabilitation of the already existing roads are proposed. Due to the rehabilitation activities, the topography in the sub-projects area will not change. As the sub-projects areas are located on flat land and the roads are already existing and currently functional.

a. Mitigation Measures

No mitigation measures would be required.

6.3.2 Loss of Trees

Trees close to the traffic lanes are road safety hazard. From the topographic survey it appears that tree cutting can be avoided at many places, it may be necessary at few places to meet road safety standards. There will be loss of vegetation in some locations which will be compensated by planting new indigenous trees with 1:5 ratio. Due to the proposed sub-projects, approximately 205 trees will be affected in the five sub-projects belonging to various species

a. Mitigation Measures

The proposed mitigation measures will include:

- Plan for compensatory planting proportion of five trees planted for each tree cut, which is more than 10 cm (2.2) "in breast height (DBH).
- Disallow introduction of invasive/exotic species and native species should be recommended for plantation.

6.3.3 Land Acquisition and Resettlement

One of the major projects related impact is usually the land acquisition for the Project ROW that will result in causing disturbance to the effected residents of the project area. No such impact is anticipated for the proposed sub-projects as, the subproject area interventions will be planned on existing alignment of road which is the property of provincial government, and therefore no land acquisition is involved. In addition, there are no squatters, encroachers, or mobile vendors/hawkers (termed as per OP 4.12 as Project Affected Persons (PAPs)) found on Subproject road. Therefore, no involuntary resettlement or impacts of livelihoods is involved.

a. Mitigation Measures

No mitigation measures would be required.

6.3.4 Public Utilities

Due to the proposed sub-projects, public utilities affected may create disruption of public services and economics. There is an existing storm water drain (nala) along Kalaboard to Saudabad Chowrangi road which is carrying sewerage and solid waste in addition to storm water. It overflows during rainy season. In design the nala has been segregated into sewer and storm water.

Besides, at locations where existing water supply lines are very old and have deteriorated along Kalaboard to Saudabad Chowrangi road and Saudabad Chowrangi to Jinnah Square road (Nad-e-Ali Road), the same are being replaced as per discussions and requirements of KWSB.

a. Mitigation Measures

Mitigation measures will include:

- Incorporate technical design features to minimize effect on public utilities; and
- All public utilities likely to be affected by the proposed sub-projects need to be relocated well ahead of the commencement of rehabilitation work.
- While working near water mains, KWSB will be taken on-board and KWSB site engineers will be present at the site.
- Communities along the subproject road will be pre-informed and consulted before the rehabilitation work.
- Provision of alternative supplies where applicable, e.g. water supply by tankers to affected communities

6.4 CONSTRUCTION PHASE IMPACTS AND MITIGATION MEASURES

Following is the brief description of impacts and their mitigation envisaged during the Construction Phase.

6.4.1 Air Quality

The sub-projects rehabilitation activities will involve excavation work, leveling and filling activities, hauling and vehicles movement. These activities produces dust particles that could have adverse effect to human health if emit in high concentration and may also cause damage to vegetation by clogging the photosynthesis process in plants.

Air sensitive receivers of the sub-projects area that can be effected by the construction dust, include general public, school, mosques, markets, factories, petrol and CNG Pumps etc. Any other premises or places having similar sensitivity to the air pollutants may also be considered to be the sensitive receptors/receivers.

a. Mitigation Measures

In order to avoid or mitigate impacts the Contractor shall follow the following mitigation measures:

- Position any stationary emission sources (*e.g.*, portable diesel generators, compressors, *etc*.) as far as is practical from sensitive receptors.
- Construction site including soil and material piles at the site should be barricaded to avoid material escape, generation of dust.

- Road construction operations should be carefully planned and scheduled and when the traffic movement is minimal e.g. early morning.
- Careful handling and working under moist conditions and monsoon season will be avoided as much as possible.
- Road construction operations should be carefully planned and scheduled and when the traffic movement is minimal e.g. early morning.
- Careful handling and working under moist conditions and monsoon season will be avoided as much as possible.
- All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins.
- Carry out watering for dust control at least two times a day: in the morning, at noon, and in the afternoon during dry weather with temperatures of over 25^{o}C, or in windy weather. Avoid overwatering as this may make the surrounding muddy.
- Ensure proper state of maintenance of machinery and vehicles to minimize exhaust emissions. Smoke emitting vehicles and equipment shall not be allowed and shall be repaired or removed from the project.
- Wherever possible, use electrically-powered equipment rather than gas or diesel-powered equipment.
- Open burning of solid waste from the Contractor's camps should be strictly banned;
- Air quality monitoring should be carried out as mentioned in EMP.

6.4.2 Noise

Main sources during construction are heavy machinery such as bulldozers, excavators, stabilizers, concrete mixing plant, pneumatic drills, stone crushers s and other equipment. The above machinery is expected to generate noise levels that would be severe in the areas whereas previously no roadside construction is carried out. Noise generated by construction machinery is likely to affect sensitive receptors located within 50 meters of the proposed roadway.

a. Mitigation Measures

Mitigation measures mentioned below should be taken in order to minimize the impacts of noise in the sub-projects area. These measures include, but are not limited to the following:

- Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and workdays will be limited to less noise-sensitive times. Construction and rehabilitation activities will be strictly prohibited between 10 PM till 7 AM in the residential areas. When operating close to sensitive areas (within 250 meters) such as medical facilities, the Contractor's hours of working shall be limited to 8 AM to 6 PM;
- Use temporary noise barriers while working in sensitive locations in case accidence of allowable limits is expected. Placing construction metal barriers / sheets will be provided to reduce noise and dust pollution.

- Give notice as early as possible to sensitive receptors for periods of noisier works such as excavation. Describe the activities and how long they are expected to take. Keep affected neighbours informed of progress.[10]
- Provide periods of respite from noisier works (for example, periodic breaks from jackhammer noise).
- The weekend/evening periods are important for community rest and recreation and provide respite when noisy work has been conducted throughout the week. Accordingly, work should not usually be rescheduled during these times.

6.4.3 Water resources

There is no surface water feature near to proposed sub-projects. The sub-projects only contains wastewater drains hence no impact to surface water resources due to proposed sub-projects.

a. Mitigation Measures

No mitigation measures would be required.

6.4.4 Flora

About 205 numbers of trees of different species and belonging to different age groups will be cut due to the proposed subprojects.

a. Mitigation Measures

Mitigation measures will include:

- The indigenous trees most suited to the tract like Neem, Peepal, Alstonia, Albezia, Amaltas etc. will be used during re-plantation activities;
- Effort will be made to save as many trees as possible even if they are young or poll stage. Proper irrigation and maintenance of plants will be ensured;
- The number of trees planted after the rehabilitation work will be five times the number of trees removed;
- Laydown areas and compounds will be sited to avoid unnecessary clearance of vegetation;
- Flowering and fruiting trees will be planted along the road to beautify the landscape
- The contractor's staff and labour will be strictly directed not to damage any vegetation such as trees or bushes.
- Contractor will supply gas cylinders at the camps for cooking purposes
- The contractor will be required to regularly water roadway surfaces. The spraying will be done at least two times daily or at such frequency that will be is needed to minimize impacts.
- The traffic controls and speed limits must be implemented to reduce dust generation from lose soil and construction activity.

[10] Environmental Impact Assessment, GEO: East–West Highway (Khevi–Ubisa Section) Improvement Project, 2018

- The tree plantation plan should include the plantation of native trees and Conocarpus specie must be avoided.

6.4.5 Fauna

The usual fauna found in the sub-projects area have already been mentioned earlier in Baseline. The major fauna are the domesticated animals. Another impact on the fauna of the sub-projects area will be the probable dislocation of the birds/animals (rodents) from their nests and burrows.

a. Mitigation Measures

Mitigation measure will include:

- Strict compliance of Wild Life Protection, Preservation and Conservation Act, 1975;
- New and good condition machinery with minimum noise will be used in construction;
- Noisy work will not be carried out in nighttime so that there should be no disturbance to local birds and animals;
- Borrow pits will be fenced so that no large animal can fell into these;

6.4.6 Physical Cultural Resources (PCR)

There are no sites of protected areas, historical, cultural, archaeological, or religious significance are known to exist at or in the immediate vicinity of the project components that are known at this stage.

a. Mitigation Measures

If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1. Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;
2. Immediately notify the local government authorities;
3. Record details in Incident Report and take photos of the find;
4. Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor.

6.4.7 Sensitive Receptors (SR)

No SRs is located within ROW of sub-projects, hence, no relocation of SRs is required.

a. Mitigation Measures

No mitigation measures would be required.

6.4.8 Construction Camps/Camp Sites

The project will involve the establishment of new campsites at the sub-projects area. Due to the proposed camp sites, loss of vegetation and assets on the selected land and dissatisfaction of rehabilitation measures during and after completion of construction phase may occur. However, it will be a temporary and minor negative impact. However, a range of impacts those either remain likely to occur or are unavoidable. For theses impacts, mitigation

measures have been developed to minimize the likelihood, extent or duration of their occurrence, and any associated adverse effects.

a. Mitigation Measures

The Mitigation measures will include:

- The construction contractor will be required to assess the environmental/social sensitivity of any additional or alternative sites prior to their approval for adoption;
- Individual trees and shrubs of high conservation value to be marked and preserved wherever possible.
- Provide adequate warnings of impeding works to all potential receptors within a 1 km corridor surrounding the ROW via public notices and local news;
- Implement Waste Management Plan to include procedures for the classification, storage and disposal of all construction wastes.
- State land or by land where there is a lessee could be used for Worker Camp locations.

6.4.9 Waste Disposal

Typical solid waste generated during construction include waste concrete, empty cement bags, excavated soil etc. The solid waste has the potential to cause negative impact on the surroundings if not properly managed and disposed of. It is likely to block nearby drainage channels that can ultimately cause localized flooding during the monsoon and nuisance to the public.

Sludge from existing nala, bitumen/ asphaltic layers, asbestos pipes will be the construction waste. Existing asphaltic layers will be scarified and disposed off properly at designated landfill sites approved by concerned DMCs. The existing base and sub-base material will be excavated and reused as sub-base material after mixing and conforming to sub-base material grading as per project specifications. Sub Head: Road Works, BOQ Item No. 1 (Demolishing of existing road pavement), BOQ Item No. 3 (Reuse Sub Base Material).

Poor waste management practices would result in short term negative impact on the aesthetics of the surrounding. It can also deteriorate air quality.

a. Mitigation Measures

Mitigation measures will include:

- The solid waste generated from the camp site will be disposed-off through Municipal Committee or approved landfill site.
- Burning of waste will be prohibited at sub-projects site;
- Planning for disposal sites with reasonable distance from the human settlements;
- Disallow siting for work camps, including waste dump sites, in a distance closer than one kilometer to any nearby community;
- Incorporate technical design features for refuse collection containers at sites that would minimize burning impacts;
- Training of work force in the storage and handling of materials and chemicals that can potentially cause soil contamination;
- Used oil should be collected in separate containers stored on impervious platform with restricted access and must be sold to licensed contractor and the burning of waste oil should be strictly restricted;

- Segregating and stockpiling scarified/ milled bituminous material and reusing this material in sub grade/shoulders;
- The existing wearing and base course scrap can be reused in sub-base course of the new road or disposed at Jam Chakro Landfill site via tarpaulin covered dump trucks.
- Empty drums of bituminous material as well as bituminous material itself will be reused as far as possible, recycled back to the asphalt mixer or ultimately disposed at Jam Chakro Landfill site.
- All hazardous waste like Paint Waste (Waste Paint, Drums and Rollers/ Brushes), will be handled and disposed through incineration via EPA certified hazardous waste contractor hired by CC.
- All pipes made up of asbestos cement if discovered during rehabilitation, will be handled, transported and safely disposed to the designated landfill site through EPA certified hazardous waste contractor hired by CC.
- Construction Contractor's HSE Plan shall clearly include a section on Asbestos Management that will ensure disposal in a manner that keeps the material in predominantly whole pieces to be considered non-friable. Sanding, sawing, grinding, chipping, or the use of power tools shall not be allowed. The asbestos containing pipes will be kept wet during removal and wrapped in plastic to avoid escape of asbestos fibers into the air.
- Recycling of solid waste will be carried out as far as possible and practical like cement bags, empty drums, discarded bricks etc.
- No wastes should be dumped at any location outside the site boundary/designated disposal site.
- Training should be provided to working personnel for identification, segregation, and management of waste.
- The site-specific waste management plan will be developed by CC.

b. *Waste Segregation*

All hazardous waste if found shall be segregated from nonhazardous wastes at the point of generation of waste. During construction phase, suitable containers with following color coding shall be kept to collect and segregate common wastes at all facilities:

Recycling

Recycling and reuse minimizes the quantity of waste requiring disposal. Some of the wastes can be reused within the construction site while others can only be recycled (Table 6.2). There is a great recycling potential for few of these wastes in the recycling market at Karachi. Waste shall be sold to the third-party contractors/ companies, who have proper recycling facilities.

CC will suggest/recommend recycling of the paper, glass, plastic wastes in their respective processing units. Iron/steel waste would be sent to re-rolling mills.

Table 6-2: Waste management options

S#	Waste Type	Category	Disposal Options
1.	Municipal Sludge present at some portion of right track	Non-hazardous	Collected via front end loader into dump trucks and disposed in Jam Chakro Landfill site.
2.	Excavation Material	Non-hazardous	Reuse for backfill

S#	Waste Type	Category	Disposal Options
3.	Construction debris including Scrap	Non-hazardous	Recycle, reuse or sell to third party contractor.
4.	Metals	Non-hazardous	Store cuttings in designated area for reuse. Remove surplus materials and use them at other sites, where feasible.
5.	Concrete	Non-hazardous	Store unused concrete blocks for later reuse. Recycle, reuse or sell to third party contractor.
6.	Bricks	Non-hazardous	Reuse for footings and broken bricks.
7.	Plastic and vinyl	Non-hazardous	Recycle, reuse or sell to third party contractor.
8.	Corrugated Cardboard	Non-hazardous	Recycle, reuse or sell to third party contractor.
9.	Woods	Non-hazardous	Recycle
10.	Empty Drums and Containers	Non-hazardous	Disposed them off through recycler.
11.	Oily Rags (Used)	Non-hazardous	Dispose to Sanitary Landfill.
12.	Paint Waste (Waste Paint, Drums and Rollers/ Brushes)	Hazardous	Handled and disposed through incineration via EPA certified waste contractor hired by CC.
13.	Sanitary Wastewater	Non-hazardous	Treat wastewater in septic tanks before disposal.
14.	Trash	Non-hazardous	1. Segregate glass, metal, plastic from trash. 2. Recycle all recyclable items. 3. Designed landfill.
15.	Asbestos containing Pipes	Hazardous	Handled and disposed through landfill via EPA certified waste contractor hired by CC.

The Waste Tracking Form, attached below shall be used to record this information by CC, while waste is being dispatched outside construction site. It is the responsibility of respective EPA certified waste contractor to assign a suitable person to sign off the record of waste tracking before the waste is dispatched outside.

WASTE TRACKING FORM

Location of Generation:
Reporting Team:
Submitted by (Name):

Submitted on (Date):	
Waste	**Disposal Location**
Excavation Material	
Concrete	
Bricks	
Metal	
Card board	
Tiles	
Plasterboard	
Timber	
Wires	
Bitumen	
Green waste	
Drums and Containers (Empty)	
Oil Contaminated Soil	
Paint Waste	
Sanitary Wastewater	
Sludge	
General Trash	

Checked and Signed: _____ **Dated:** _____

6.4.10 Occupational Health and Safety

6.4.10.1 Crane and Lifting Operations

For all Crane & Lifting Operations CC shall ensure full compliance with standard operating procedures. CC shall develop a site-specific pre-lift checklist which includes the following at minimum:

- Crane rigging capacity adequately for load
- Condition of slings
- Rigging condition adequate for load
- Area of swing or travel unobstructed
- Multiple crane use
- Power line approach distance maintained
- Stability and footing
- Taglines and spotters

- Illumination and weather
- Signal operator
- Job hazard analysis and other permits

All lifting and rigging activities shall be supervised and conducted by a competent person or team, CC shall maintain a lifting gear registry for all lifting gear on-site inclusive of a listing of all lifting gear, copies of equipment certificates (manufacturer, safe working load, serial number) and the inspection/recertification frequency.

6.4.10.2 Forklifts and Non-Road Vehicles

CC should ensure forklift and non-road vehicles are fit for purpose and operated according to manufacturer's requirements. Only competent operators are permitted to operate forklifts and non-road vehicles.

At minimum, all forklifts and non-road vehicles shall be equipped with following equipment:

- Seat belts
- Horn
- Emergency Brake
- Wheel chock
- Labeled Controls
- Fire Extinguishers
- First Aid Kit
- Back-up Alarm

6.4.10.3 Scaffolding

CC is responsible to establish periodic inspection, certification and recertification program for scaffold works. Only qualified worker is authorized to erect, inspect and certify scaffold. All scaffolds should have a guardrail system on each open side, up to the access point. It should be equipped with toe boards having suitable access ladder.

6.4.10.4 Over-exertion

Over-exertion, and ergonomic injuries and illnesses, such as repetitive motion, over-exertion, and manual handling, are among the most common causes of injuries at construction site.

Mitigation Measures

Recommendations for their prevention and control include:

- Workers will be trained with lifting and materials handling techniques before the construction of the project, including the placement of weight limits above which mechanical assists or two-person lifts are necessary.
- Work site layout will be planned to minimize the need for manual transfer of heavy loads.
- Tools will be selected, and work stations would be designed to reduce force requirements and holding times, which promote improved postures, including, where applicable, user adjustable work stations.
- Administrative controls, such as job rotations and rest or stretch breaks will be implemented into the work processes.

6.4.10.5 Slips and Falls

Slips and falls on the same elevation associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time accidents at construction site.

Mitigation Measures

Recommended methods for the prevention of slips and falls from, or on, the same elevation include:

- Good house-keeping practices, such as the sorting and placing loose construction materials in established areas away from foot paths, would be implemented.
- Excessive waste debris and liquid spills will be cleaned up regularly.
- Electrical cords and ropes will be located in common areas and marked corridors.
- Slip retardant footwear will be used.

6.4.10.6 Struck By Objects

Construction activities of the project may pose significant hazards related to the potential fall of materials or tools, as well as ejection of solid particles from abrasive or other types of power tools which can result in injury to the head, eyes, and extremities.

Mitigation Measures

Techniques for the prevention and control of these hazards include:

- Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap.
- Temporary fall protection measures in scaffolds and out edges of elevated work surfaces would be used, such as hand rails and toe boards to prevent materials from being dislodged.
- Appropriate PPE such as safety glasses with side shields, face shields, hard hats, and safety shoes, would be wore.

6.4.10.7 Moving Machinery

Vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dust, emissions, and noise.

Heavy equipment operators have limited fields of view close to their equipment and may not see pedestrians close to the vehicle. Center-articulated vehicles create a significant impact or crush hazard zone on the outboard side of a turn while moving.

a. *Mitigation Measures*

Techniques for the prevention and control of these impacts include:

- The location of vehicle traffic, machine operation, walking areas, and controlling vehicle traffic will be planned and segregated using one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic.

- The visibility of personnel will be ensured using high visibility vests when working in or walking through heavy equipment operating areas as well as training of workers to verify eye contact with equipment operators before approaching the operating vehicle.
- Inspected and well-maintained lifting devices will be used that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations.

6.4.10.8 Other Site Hazards

Construction of site may pose a risk of exposure to dust, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms.

a. *Mitigation Measures*

- Only authorized personal should be allowed at the construction site
- Identify and minimize, so far as reasonably practicable, the causes of potential hazards to workers, including communicable diseases such as HIV/AIDs and vector borne diseases;
- Avoid stagnation of water and initiate drainage/cleanup of stagnant water;
- Provide for the provision of appropriately stocked first-aid equipment at work sites;
- Provide for appropriate personal protective equipment (PPE) to minimize risks, such as but not limited to appropriate outerwear, boots and gloves; safety helmets;
- Provide training for workers for the use of PPE;
- WB Group's Environment, Health and Safety (EHS) Guidelines (attached at the end of this document) will be implemented;
- No bonded and child labor will be permitted at site;
- Labor laws will be followed including Minimum Wage, Protection against harassment of women, Work Hours, Overtime Payment.
- Also, laborers will be trained on appropriate interaction with local people especially women;
- Include procedures for documenting and reporting accidents, diseases, and incidents; and
- All safety precautions will be taken to address safety hazards for the nearby community. These precautions may include safety/warning signage, safety barrier around the construction site.
- Lighting provided for labor during night time work should be adequate but spot lights that should not create nuisance to nearby local residence.
- CC will include appropriate clauses to protect environment and public health. The sub-project ESMPs will be included in the bidding document;
- There will be no labor camp for residing the workers as local labor will be hired. Only Porta cabins of Resident Engineers and PSC staff will be provided that will also serve as the shelter for labor during construction and provision of water. Therefore, no generation of wastewater will be envisaged;
- The location of Porta cabins will be decided by PSC based on detailed construction plan.
- WB Group's Environment, Health and Safety (EHS) Guidelines (attached at Annexure-VII) will be implemented.

6.3.4.11 Harassment of women in the work place

A Code of Conduct at the Workplace will be developed by CC to provide protection and safety to women against harassment.

6.4.11 The Traffic Management

Due to the proposed construction activities, proper traffic management may pose a challenge in the sub-projects area. Improper management may result in traffic jams and cause inconvenience to the people passing through the sub-projects area due to movement of vehicles carrying construction materials. It will also increase the traffic load on the existing road network, thus deteriorating the existing condition of the road. Also, the movement of vehicles along the haulage routes may cause soil compaction and alteration of percolation, vegetation pattern and damage to properties and utilities.

a. Mitigation Measures

Mitigation measures will include:

- Proper traffic management plan will be needed to avoid traffic jams/public inconvenience;
- Movement of vehicles carrying construction materials should be restricted during the daytime to reduce traffic load and inconvenience to the local residents;
- Coordinated planning of traffic diversions by the traffic police and the Transport Department in accordance with the construction programme with advance warnings to the affected residents and road users;
- Construction vehicles, machinery and equipment will move or be stationed in the designated ROW to avoid un-necessary compaction of soil;
- Availability of continuous services of the police in the diversion and control of traffic; and
- The executing agency is required to maintain liaison between the Highway/ Traffic Police, local residents/ travelers and the contractor to facilitate traffic movement during construction stage.

6.3.4.12 Traffic Management Plan

For storm water, pipe drain are being proposed under footpath or at existing road edges, therefore, traffic can operate along existing road. In some cases where existing roads warrant reconstruction, the traffic of both sides will operate on one carriageway and the other carriageway will be re-constructed (Figure 6-1 - Figure 6-3).

S. No.	Sub-project	Categories
1	Saudabad Chowrangi to N5	Less affected
2	Kalaboard to Saudabad	Moderately affected
3	Saudabad Chowrangi to Kalaboard	Highly affected
4	Naad e Ali Road – Jinnah Square to Saudabad	Less affected

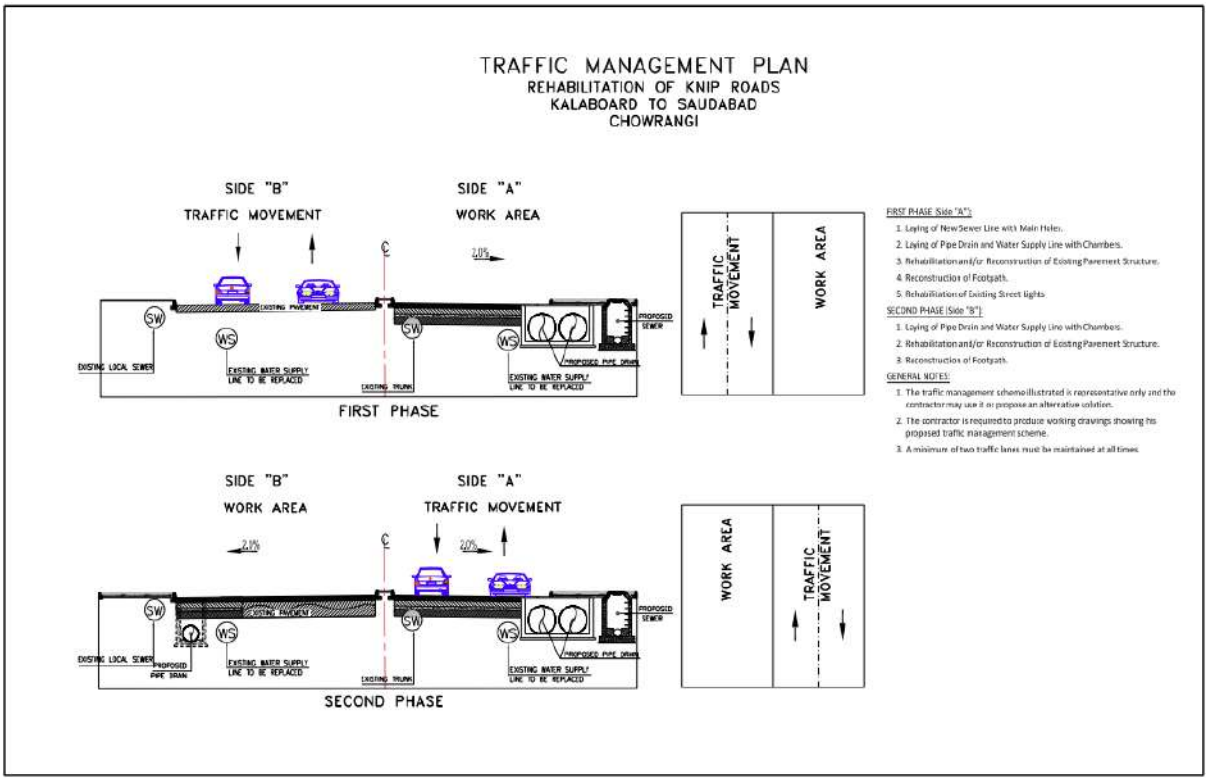


Figure 6-1: Traffic Management Plan - Kala Board to Saudabad

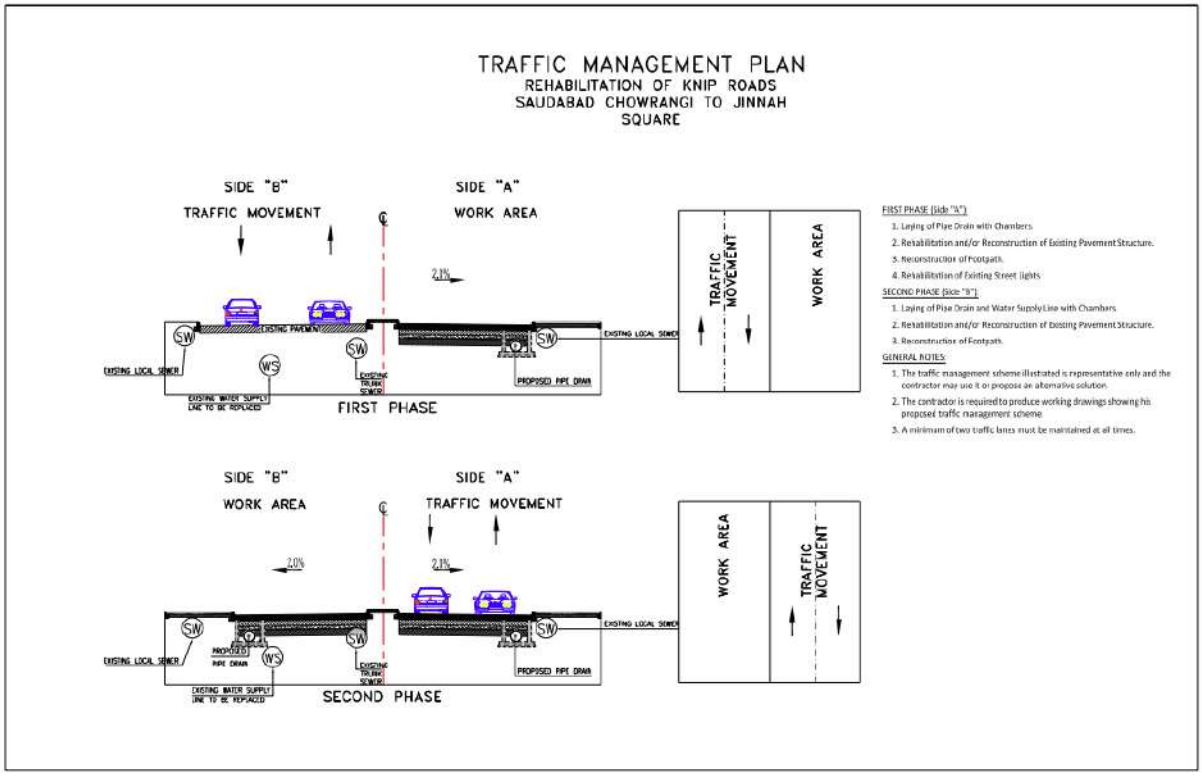


Figure 6-2: Traffic Management Plan - Saudabad to Jinnah Square

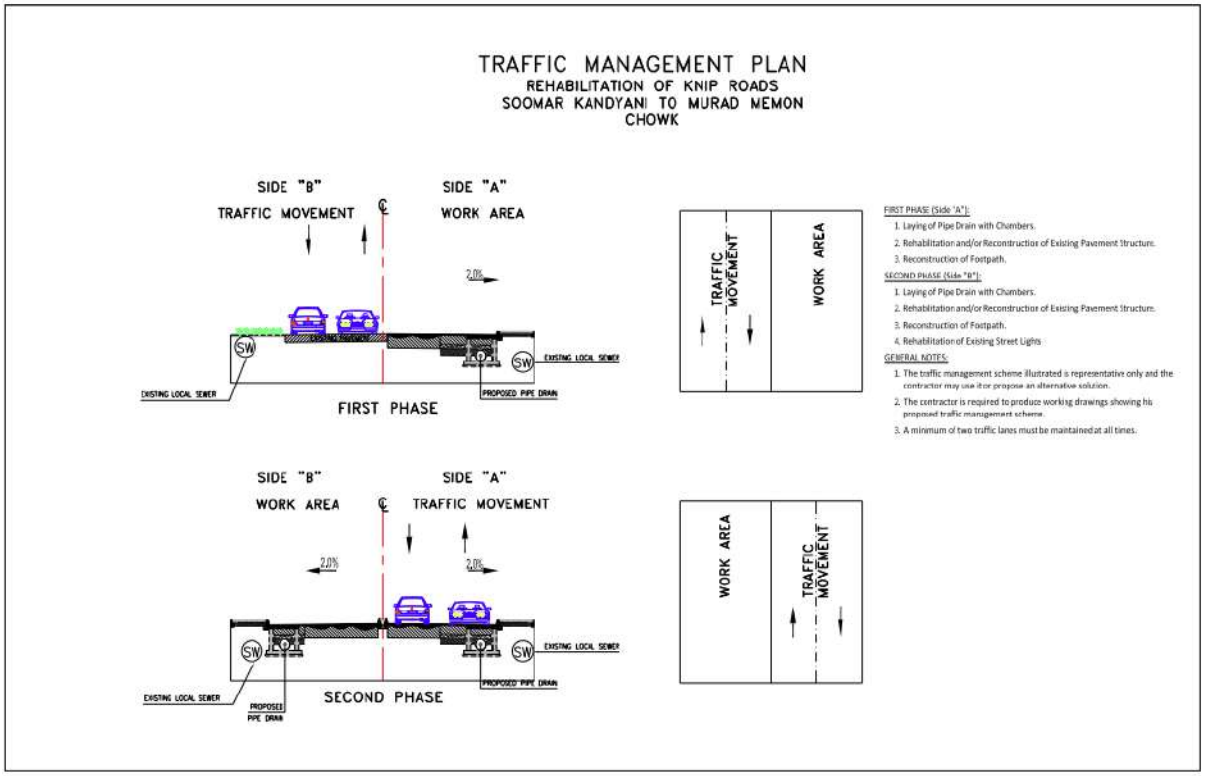


Figure 6-3: Traffic Management Plan - Soomar Kandiyani to Murad Memon Chowk

6.4.12 Communicable Diseases

The laborers in the Contractor Camp, truck drivers and like personnel who interact with each other have the potential for the spread of communicable diseases like COVID-19 and HIV/AIDS. Majority of the people living in the surrounding of the sub-projects, and potential labor are not aware of the source, mode of communication or consequences of HIV/AIDS. Although their religious and cultural value system, to a large extent excludes the outbreak or rapid communication of COVID-19 and HIV/AIDS, yet its occurrence in such a situation cannot be precluded. It is necessary that awareness and preventive campaigns are run from time to time in the labor camps and the field offices of the sub-projects to prevent the communicable diseases.

There is a chance of spreading of an epidemic of Coronavirus disease (COVID-19) due to close interaction of the labor force during construction not only among the workers but also in the area. This impact can be categorized as direct, medium, site-specific, short term, temporary, high probability and reversible.

a. Mitigation Measures

The Contractor shall:

- Arrange to run an active campaign, in the labour camp, to make people aware of the cause, mode of transmission and consequences of COVID-19 and HIV/AIDS;
- SOPs related to the disinfection and environmental decontamination advised by National Action Plan for COVID-19 Pakistan to control spreading of COVID-19, shall be implemented by the contractor, and should be strictly monitored.
- Strengthen the existing local health and medical services for the benefit of labour as well as the surrounding communities.

- Ensure cleanliness and hygienic conditions at the labour camp by ensuring proper drainage and suitable disposal of solid waste. Inoculation against Cholera will be arranged at intervals recommended by the Health Department.
- Locating a labour camp at least away from the local settlement
- Keep all the camps, offices, material depots, machinery yards and work sites open for the inspection of health and safety measures and related documents.

6.5 OPERATIONAL PHASE IMPACTS AND MITIGATION MEASURES

The anticipated environmental impacts related to the proposed sub-projects have been studied for the operational stage of the sub-projects as discussed hereunder.

6.5.1 Air Quality

Improvement in road condition will help reduce traffic related emissions in the short term by allowing a smoother traffic flow. However, in the longer run, increased traffic levels and congestion will result in the rise of vehicular emissions (CO, NO_x, SO_x, PM_{10}) associated with the adverse effects on the environment and human. In case of improvement of road conditions and minor negative, when traffic volume increased in the sub-projects area that may result in causing public health risks, nuisance, and other impacts on bio-physical environment.

a. Mitigation Measures

Mitigation measures will include:

- Setting up of a system to monitor air quality along sub-projects area in accordance with the applicable standards/limits;
- Helping the owners and occupants of the affected premises to identify and implement special measures such as hedges and vegetation to reduce air pollution;
- Roadside tree plantations as applicable and feasible under harsh climatic conditions; plants should be selected in accordance to their ability to absorb emissions;
- Regular road maintenance to ensure good surface condition;
- Speed limits at sensitive locations;
- Regular vehicle check to control/ensure compliance with SEQS; and
- Enforcement and penalties against traffic rules violators.

6.5.2 Noise

During the operational phase, the noise levels are anticipated to increase due to traffic related noise pollution mainly include use of pressure horns. This impact is permanent and moderate negative in nature.

a. Mitigation Measures

Mitigation measures will include:

- According to monitoring results, additional sound barriers in form of trees and hedges will be discussed with the affected people and planted if agreed;
- Signs for sensitive zones (health centers/educational institutions etc.) to disallow the use of pressure horns; and
- Enforcement and penalties against traffic rules violators.

6.5.3 Flora

No negative impacts are envisaged on the flora of the area during the operational phase. However, improper maintenance of the saplings planted against the trees cut for the proposed sub-projects may adversely affect the growth of those saplings which were planted to improve the environmental aesthetics of the sub-projects area. Raising of new trees along the roads shall render a positive impact on the flora of the area and will also cause a positive impact on the landscape of the area, which shall be of permanent in nature.

Presence of adequate flora will absorb CO_2 gas, through photosynthesis, emitted from an expected large number of cars, vehicles and public transport, thus purifying air of hazardous particles.

a. Mitigation Measures

Mitigation measure will include planting of 1,025 number of plants along both sides of the roads. Although it shall take 10-15 years, before these plants become trees, this planting on roads, shall not only compensate for the loss of trees, but shall contribute towards improvement of flora and environment of the tract.

6.5.4 Road Safety

Enhanced vehicular movement and speed in the long run may result in road safety issues like traffic accidents. This impact is permanent but moderately adverse in nature, since the frequency of accidents may be lowered, but their intensity may be quite severe due to enhanced speeds at which vehicles will move.

a. Mitigation Measures

Mitigation measure will include strict enforcement of speed limits, installation of speed guns and channelization of traffic with respect to categories (heavy vehicle traffic and light vehicle traffic) and enforcement of penalties for the violators. Limitation of speed in residential areas or near sensitive receptors to reduce the operational noise.

6.6 POSITIVE IMPACTS OF THE PROJECT

Due to the implementation of the proposed sub-projects components following benefits will be attained in terms of environmental, social, public health and economic sustainability:

- Smooth flow of traffic;
- Saving of vehicle travel time and vehicle operating costs of commuters;
- Reduction in the air emissions, fuel consumption and transportation cost caused by traffic congestion and bumpy roads;
- Improved communication infrastructure will promote new business opportunities. In addition such an activity will also increase the land value that will benefit the local residents. This impact will be permanent and major positive in nature.
- During the operation of the proposed roads, lesser wear and tear of the vehicles will occur and it will also result in lesser fuel consumption and decrease in operating cost. This impact is permanent and has a major positive impact.

Chapter 7. GRIEVANCE REDRESSAL MECHANISM

KNIP has devised a Grievance Redress Mechanism to address the concerns of its stakeholders and protecting the interests of directly and indirectly affected beneficiaries. The overall objective of GRM is to make the KNIP Project Implementation Unit (PIU) more accessible for project-affected communities, particularly vulnerable groups, and to provide a robust system of procedures and processes for rapid resolution of citizen's concerns and project-related complaints. A well designed and properly implemented GRM can help project management significantly by enhancing operational efficiency in a variety of ways:

- Mitigating risk- Deterring fraud and corruption
- Providing project staff with practical suggestion/ feedback that allows more accountability and responsiveness to beneficiaries
- Assessing the effectiveness of internal organizational processes
- Increasing stakeholder involvement in the project
- Analyzing information to recognize grievance patterns, identify any systemic causes of grievances, promote transparency, publicize how complaints are being handled,
- Data Monitoring and periodically evaluating the overall functioning of the mechanism; including the periodic reports to the contractor(s) and in compliance monitoring report to the World Bank.

A core characteristic of an effective Grievance Mechanism is the ability to identify minor community incidents before they escalate into unmanageable disputes. This is especially important for development projects where support from impacted communities is critical to success.

7.1 APPROACH

KNIP focuses on following a preventive approach to identify, track and resolve grievances early, offering low cost, rapid redress to citizens. The approach proposes interlinked steps:

- **Proactive Assessment of Risks and Potential Grievances/Disputes:** an in- depth review of stakeholder consultations, institutional capacity and understanding the issues that are, or are likely to be, at the heart of disputes related to the project.
- **Accessibility:** Is sufficient assistance provided to those who face barriers such as language, literacy, awareness and fear reprisal? Access ensured for vulnerable groups including women, minorities, the poor, elderly, physically disabled etc.
- **Predictability:** Clear timeframes for procedures.
- **Fairness:** Procedures should be fair for meaningful participation in the decision-making process.
- **Transparency:** Procedures and outcomes transparent enough to meet public interest concerns at stake.
- **Capacity:** Technical, Human and Financial resources should be available to deal with grievances and related issues.

7.2 INSTITUTIONAL ARRANGEMENTS

Every effort will be made to address and resolve grievances within a fixed timeframe. This will be an indicator of how well and effectively the system is performing.

The GRM will be accessible to all members of the community, including women, senior citizens and other vulnerable groups. Information about the grievance redress processes will also be translated in the national language and Signboards with contact information (dedicated phone line, email, webpage and postal mail address) will be displayed at the construction sites. Website, leaflets and discussions during stakeholder consultations will further assist in informing the concerned citizens regarding the mechanism and creating awareness. Once a complaint will be received through either of the uptake channels, the complainant will receive a tracking number, through which their complaints will be tracked.

Staff implementing the GRM (receiving and registering complaints, investigating complaints etc.) will be trained to engage with complainants by the GRM Focal person in PIU.

The Grievance Redress Focal Person (GRFP) in PIU will be responsible for providing oversight on the entire GRM process at a strategic level, monitoring of complaints management and will have the overall responsibility for GRM. She/he will determine the severity or risk associated with a complaint and decide the level at which the complaint needs to be resolved. The Project Director and Deputy Project Director would monitor the GRFP to ensure the complaints are handled efficiently.

The GRFP will investigate the complaint to determine its validity and to determine whether the source of the problem is due to project activities and identify appropriate corrective measures. The investigation will include collecting and review of relevant documents (supporting evidence is not necessary but may be helpful in reviewing and resolving the complaint), site visits, consulting appropriate internal staff, contacting external stakeholders, interviewing the complainant, if required. The GRFP will be responsible for manning the complaints received through telephone line, providing information and responses to complainants, entering and updating the complaints received through the above- mentioned uptake channels into an electronic GRM database.

The GRM electronic database will include information such as: complaint ID, basic details of complainant and the complaint, time for resolution and complainant's satisfaction with the process. This data will be useful for tracking individual complaints and will be maintained at the PIU. These reports will be reviewed by the Monitoring and Evaluation Consultant on a monthly basis for Compliance and Audit measures.

A **3 Tier mechanism** has been designed where complaints received can be addressed at 3 levels:

I. Field
II. Stakeholder, and
III. Department

7.3 FIELD LEVEL MECHANISM

Complainants will be able to register their grievance at the field or project site. An easily accessible and identified focal point and user-friendly help desk would be set up on the sub-project site. A specific staff would be hired by the Contractor for Grievance Registration. A set

of Registration Forms with specific serial numbers would be used and concerned citizens can register their complaints.

A drop-box would also be placed on the Sub-project site, where a set of registration forms with separate serial numbers would be available. These would help to distinguish complaints received from the Helpdesk. Citizens who do not want to disclose their identity would have the option of Dropbox facility.

All complaints received at the field level will be brought to the notice of the GRFP who will decide if the complaint can be dealt with at the field level or if it needs to be escalated to a higher level.

On the other hand, complaints that are directly received in PIU (through telephone line, postal mail, e-mail and web link) will be assessed first by GRFP. In case the complaint is of a minor nature and can be resolved on site, the GRFP will inform the field level committee to proceed with the resolution process.

Once a complaint has been resolved, the GRFP who will, in turn, contact the complainant to determine satisfaction with both the process and the outcome. Information in this regard will be maintained in the GRM database.

The GRFP will monitor the timeline and if complaint cannot be resolved on spot or within a timeframe of Five (5) working days, the GRFP will then coordinate with the relevant PIU staff to address the issue.

Complaints that cannot be resolved on the spot or within a time frame of Five (05) working days on site will be directed back to the GRFP in the PIU who will assess the issue and coordinate with relevant PIU staff to address the issue.

The PIU team would try to ensure that grievances should be resolved at their initial Field Level. However, if the nature of the complaint cannot be addressed on Tier 1, within Five (5) working days, the issue would then be escalated to the Stakeholder Level by the GRFP.

7.3.1 Field Level Committee Members:

- Grievance Redress Focal Person Senior Engineer PIU
- Resident Site Engineer – Supervising Consultant Contractor
- Resident Site Engineer – Supervising Consultant
- Contractor
- Concerned PIU Specialist/Staff

7.3.2 Stakeholder Level:

- This is the second stage of our Grievance Redress Mechanism, where outside stakeholders and civil society would be brought on board by the GRFP to resolve the grievance.
- Additional members would be added so non-availability should not affect the quorum. This committee would have 7 working days to reach a decision to address the issue, however if solution is not attained within the required timeline, the grievance would be escalated to Department Level.

7.3.3 Stakeholder Committee Members:

- Deputy Project Director PIU

- Grievance Redress Focal Person – Social Development Specialist Concerned PIU Staff
- Concerned PIU Specialist/Staff
- Local Community and Civil Society Representatives for Project Sites in Saddar, Malir and Korangi.

7.3.4 Department Level:

- All efforts would be made to resolve the grievance on the Field and Stakeholder levels. However, grievances that cannot be resolved, it would be addressed at the Department Level to reach a satisfactory conclusion.

7.3.5 Department Committee Members

- Project Director - PIU
- District Municipal Commissioner
- Grievance Redress Focal Person-PIU
- Concerned PIU Specialist/Staff

The Grievance Redress Mechanism has been designed to resolve the complaints within a maximum timeframe of 21 working days.

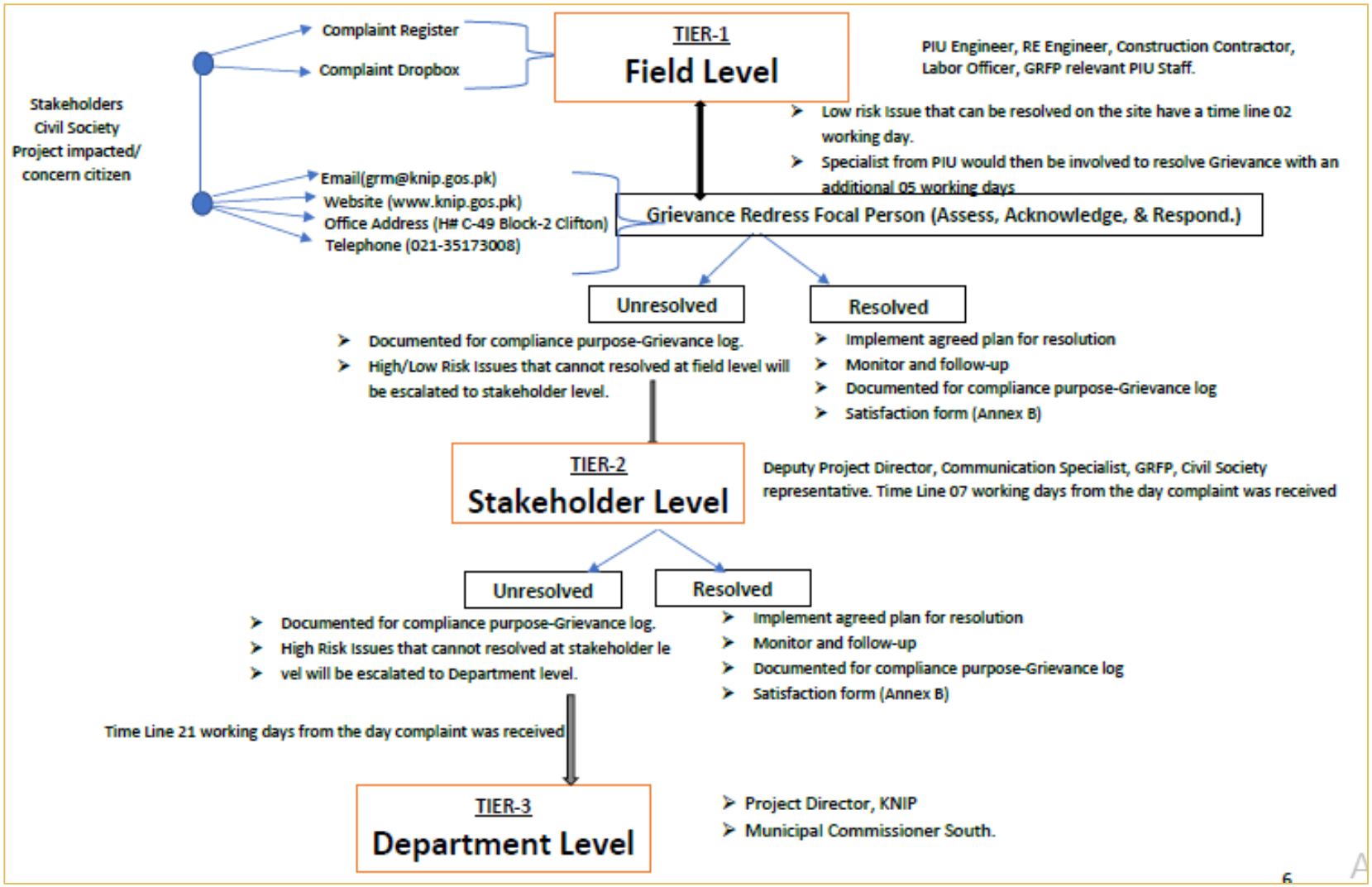


Figure 7-1 Grievance Redressal Mechanism

Chapter 8. STAKEHOLDER CONSULTATION

This chapter provides an overview of the stakeholder consultation process that was adopted by the consultants and presents the findings of the stakeholder engagements with primary and secondary stakeholders. The key aspects, including consultation objectives, consultation tools/methodologies and stakeholders' feedback are discussed in the following sections.

8.1 OBJECTIVES OF STAKEHOLDER ENGAGEMENT PLAN (SEP):

The overall purpose of the consultation was to disseminate information about Karachi Neighborhood Improvement Project (KNIP) and its' emergency sub-projects in Malir areas among the stakeholders.

The Key objectives of the SEP are following:

- To identify and involve key stakeholders that are benefitted, affected, and/or able to influence the Project and its activities;
- To identify the most effective methods and structures of disseminating project information, and to ensure regular, accessible, transparent and appropriate consultation;
- To develop stakeholders' engagement process that provides stakeholders with an opportunity to influence project planning and design;
- To keep in loop all stakeholders for effective implementation of prescribed policies and processes during the construction phase;

8.2 GROUP OF STAKEHOLDERS

The consultant team, comprised of Design, Social and Environmental teams, and Safeguard officers they conducted various consultations in the form of Consultative Meetings, Focus Group Discussion (FGDs), and In-depth Interviews (IDPs) with stakeholders.

Following are the group of stakeholders with whom consultation was conducted.

- Local Residents (male and female)
- Sports and youth groups
- Business owners
- Mobile vendors and small cart owners
- Government departments (local Govt. DMCs)
- Utility agencies
- NGO/ CBO

Table 8-1 Total Number of Respondents

Target Group														
S. #	Sub-Projects	Residents		Educational Institutes		Trader/ Business Owners		Government Departments		Mobile Vendors		Sports/ Youth Group		Total
		M	F	M	F	M	F	M	F	M	F	M	F	
1	Rehabilitation of Emergency Sub-Projects Malir	58	41	3	37	37	0	16	1	1	0	15	0	209

8.2.1 Findings of Consultation

The table below provides the findings after consulting the utility agencies of the emergency sub-project areas

Table 8-2 Stakeholder Consultations with Utilities – Base Matrix

Stakeholders Consultations with Utilities– Base Matrix					
S. No	**Name**	**Information shared by the Consultant**	**Feedback/ Comments by the Stakeholder**	**Actions to be taken**	**Design Modification**
Consultation with MC Korangi District					
1.	Municipal Commissioner, M. Faheem Khan	Background information of the Emergency Sub-Project and Concept Design for the rehabilitation shared via Power Point Presentation, with the MC, Korangi District.	The Municipal Commissioner suggested to use recycling plant for green area/ parks. He also, suggested to privatize these areas for proper maintenance. The utility services plans will be provided by the concerned departments.	The details regarding services will be provided by the relevant departments. Based on these details the proposals will be provided. Privatizing of parks proposed by Municipal Commissioner will be shared by the client.	No design modification is required, because the suggested works are manageable for Korangi & Malir Emergency Sub-Projects.
Consultation with KW & SB Korangi District					

2.	Executive Engineer, Mr. Khalid Farooqi	Background information of the Emergency Sub-Project and Concept Design for the rehabilitation shared with KW & SB, Korangi District.	All the issues related to rehabilitation of underground sewerage and water lines to be addressed before the rehabilitation of roads so that no damage is caused to the roads and the Sub-Project areas are rehabilitated.	The drawings of 16000 road and other roads to be provided by KWSB. Adequate and continuous access of water to be provided during construction to all project beneficiaries.	As per response of the stakeholder.
Consultation with KW & SB Model Zone					
3.	Associate Executive Engineer, Mr. M. Sumair Khan	Background information of the Emergency Sub-Project and Concept Design for the rehabilitation shared with KW & SB, Model Zone - Korangi District.	Current status of sewerage lines discussed. All the issues related to rehabilitation and retrofitting of underground sewerage and water lines to be addressed before the rehabilitation of roads so that no damage is done after the roads and the Sub-Project areas are rehabilitated.	30” diameter sewerage line of Kala board placed by KDA is new, only needs to be cleaned by the winching machine. KWSB plan is to replace all old lines. The same proposal has been sent to concerned authorities for funding. Water lines are almost 50 years old. Explained by AXN (Water) that main lines of water (24” & 30”) (Dia) laid on both tracks	Rehabilitation of road from Saudabad Chowrangi – Jinnah Square should extend 1000 meters extra till Liaquat Square for the betterment suggested by KW & SB.

				of all the existing roads. Adequate and continuous access to be provided during construction to all project beneficiaries.	
Consultation with Senior Manager PTCL South Zone Karachi					
4.	Senior Manager South District Mr. Syed Hassan Haider	Background information of the Emergency Sub-Project and Concept Design for the rehabilitation shared with PTCL, South District. Test pit will be required to identify the depth of PTCL cables as per drawings provided by the stakeholder before construction begins.	All the cables are protected, but could be affected during construction. Agreed for the test pit. They do not have the as built drawings however; they have promised to cooperate during construction phase.	PTCL will provide the contact of the representative for surveys and construction phase of the identified areas.	No design modification is required, because the suggested works are manageable for Korangi & Malir Emergency Sub-Projects. The present state of the infrastructure is so dilapidated that any improvement will make huge betterment in the neighborhood.
Consultation with Govt. Department DMC and Utility Agencies					
5.	DMC Administrator Ms. Sajida Kazi (K.E, KW & SB, PTCL)	Background information of the Emergency Sub-Project and Concept Design for the rehabilitation	All the utility agencies who have their stakes in the Sub-Project areas, should nominate their focal person to	To start the implementation of construction work as soon as possible.	No design modification is required, because the suggested works are manageable for Korangi &

		shared via Power Point Presentation, with the Administrator DMC, Korangi District.	coordinate with KNIP. Noted all the suggestions. KNIP will optimize the design accordingly.		Malir Emergency Sub-Projects.

Figure 8-1 Consultation with Mr. Khalid Farooqi, Executive Engineer – KWSB Office, Korangi District

Figure 8-2 Consultation with Mr. M. Faheem Khan, Municipal Commissioner, Korangi District – DMC Korangi Office

Figure 8-3 Consultation with Mr. M Sumair Khan Associate Executive Engineer (AEE) – KWSB Model Zone, Korangi District

Figure 8-4 Consultation with Mr. Syed Hassan Haider Senior Manager (South District) – PTCL Office South District

Figure 8-5 Consultation with Ms. Sajida Kazi, Administrator with the utilities, Korangi District – DMC Korangi Office

8.2.2 Consultation with Ms. Erum Coordinator TCF School

The consultation meeting was arranged with the Coordinator of TCF School located on the road from Saudabad chowrangi to Kala Board, regarding KNIPs interventions in the emergency sub-project areas. The Coordinator appreciated the proposed plan and

emphasized that the rehabilitation of the surrounding area of the school premises will help facilitate, the school staff, children and parents alike to commute easily to school.

- It will make their lives easier once the footpaths and pelican crossings are made and will ensure road safety.
- It was suggested that the roadside drains should be covered to maintain safety and cleanliness. The school administration extended their support for the proposed sub-projects.

A summary of the meeting is provided in the table below:

Table 8-3 Consultations with TCF School

S. No	Name	Recommendations /Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	Appreciated the idea of rehabilitating the footpaths and pelican crossings in the proposed design. It will make easier to commute for the users and will ensure road safety. It was suggested that the roadside drains should be covered to maintain safety and cleanliness. Emphasized that the on ground work should start as soon as possible.	The suggestions are already incorporated in the concept design.	No design modification is required.

Figure 8-6 Consultation with the Coordinator of TCF School

8.2.3 Consultation with Police Officer Saudabad Model Police Station

The consultation meeting with the police officer located on the road from Saudabad chowrangi to Kala Board, regarding KNIPs interventions in the emergency sub-project areas. The Officer supported the proposed plan for the rehabilitation of the sub-projects. The Officer informed that accidents take place on the surrounding roads due to lack of pelican crossing and footpaths. He offered all his support for the rehabilitation of the sub-project areas.

Table 8-4 Consultations with Saudabad Model Police Station

S. No	Name	Recommendation/ Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	The proposed plan for the rehabilitation of the sub-projects was appreciated and was in favor of the rehabilitation. Informed that accidents take place on the surrounding roads due to lack of pelican crossing and footpaths.	The footpaths and pelican crossings are already incorporated in the concept design.	No design modification is required.

Figure 8-7 Consultation with Police Officer of Saudabad Model Police Station

8.2.4 Consultation at Govt. Girls Primary School

The consultation meeting with community, and social workers of Malir area, represented by the female teachers and the local residents (male/female), involved in the activities for the betterment of the area joined the meeting. The meeting was conducted at the common room of Govt. Girls Primary School.

It was observed in the public consultation meeting that the people of the sub-project areas were in favor of rehabilitating the road from Saudabad Chowrangi to Nade Ali to Jinnah Square.

- The main emphasis of the residents was on removing garbage dumps to request SSWMB to arrange proper dumping stations for solid waste. The residents appreciated the idea to develop roads, footpaths and pelican crossings.
- They were also in favor of developing RCD ground into a football ground and also incorporating play area for the children in it. Sewerage lines must be fixed before the reconstruction of roads to avoid further inconvenience for the residents.
- Everyone was interested to witness the on ground work to start as soon as possible. Appreciated the initiative by KNIP and the concept design of the roads and public places.

A summary of all the issues and the suggestions of local residents' men/women are provided in the table below:

Table 8-5 Consultations with local residents and design modifications

S. No	Name	Recommendation/ Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	Suggested to alert solid waste management agencies to collect solid waste from the school surroundings. Emphasized to remove garbage and requested SSWM to make a proper dumping station.	The SSWMB will be informed about the situation.	No design modification is required, except increase in solid waste dustbins in the sub-project areas.
2.	Respondent 2	Emphasized that there were no proper bus stops, the current bus stops are in bad condition of the sub-project areas.	The consultant showed the proposed designs to rehabilitate the bus stops.	No design modification is required.
3.	Respondent 3	Appreciated the idea of developing RCD football ground and a play area for children.	No response required	No design modification is required.
4.	Respondent 4	Appreciated the idea of rehabilitating Kala board road, footpaths and pelican crossings.	No response required	No design modification is required.
5.	Respondent 5	Suggested to fix the sewerage lines before construction of the road begins, to avoid further inconvenience for the residents.	The consultant told the respondents that meetings with the KW & SB was already done considering this issue.	No design modification is required.
8.	Respondents 6	Appreciated the idea of the proposed concept design. Wanted on ground work to start as soon as possible. Appreciated the initiative by KNIP and the concept design of the roads and public places.	The consultant will make sure to start on ground work as soon as possible.	No design modification is required.

Figure 8-8 Consultations with Govt. Girls Primary School

8.2.5 Consultation with Local Communities and Businesses

Consultations with communities and businesses were carried out, in line with the following objectives. Generally, respondents had positive views for the proposed sub-projects interventions and they hoped that they will experience some improvements this time, as compared to the previous unfulfilled promises, futile surveys and consultations. Benefits envisaged by the respondents are as follows:

- The drainage and sewerage of the area will be improved
- Traffic jams will be eliminated
- The road will be safe during the rainy season
- The ditches in the roads will be fixed
- No other agency will dig the road for utility work purpose
- Footpaths/ sidewalks will benefit the pedestrians to commute easily
- Pelican crossings will benefit people to cross the road and will reduce accidents
- Overall positive impact to the area residents and businesses

A summary of all the issues and the suggestions of the business communities using the sub-project areas are provided in the table below:

Table 8-6 Consultation with local businesses and design modifications

S. No	Name	Recommendations/ Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	The respondent was hardly satisfied with the current situation of utilities, traffic, garbage, and sewerage. Was in favor of underground electric wires and utilities for safety purposes.	The consultant told the respondents that meetings with all the utilities agencies were already conducted regarding these issues.	No design modification is required.

The pictorial evidence of Consultations is presented as follows:

2.	Respondent 2	The respondent was willing to face disturbance and inconvenience during the construction phase to manage daily activities. However, suggested that the dust mitigation measures are to be taken like spraying water.	Mitigation measures will be taken as per suggestions.	No design modification is required.
3.	Respondent 3	Accidents take place often due to open manholes and damaged roads. Most of the sub-project areas lack basic infrastructure facilities. Health issues are the most common outcomes due to the absence of basic necessities.	The concept design caters to all basic infrastructure facilities.	No design modification is required.
4.	Respondent 4	Lack of street lights in the sub-project areas is a problem to commute at night, keeping in view the safety measures.	The streetlights are already proposed in the concept design.	No design modification is required.
5.	Respondent 5	Appreciated and was willing to accept temporary disruption during the construction phase to get benefit from a long-term comfort associated with the project.	No response required.	No design modification is required.

Figure 8-9 Consultation with local businesses through Intercept Surveys

Figure 8-10 Consultation with roadside shops, vendors and Solid waste management workers

Figure 8-11 Consultation with local shops and residents

8.2.6 Consultation with Business Community at Urdu Chowk

The business owners whose businesses are located around the Urdu Chowk bus stop road that will require rehabilitation were consulted.

- In the public consultation meeting it was observed that the people of the emergency sub-project areas were in favor of rehabilitating the road from Saudabad Chowrangi to Urdu Chowk.
- Unavailability of water, and sewerage problems were the main concern of the residents of the sub-project areas.
- Unavailability of arrangements for solid waste disposal is another concern of the residents.
- The residents were willing to take the ownership of the newly rehabilitated sub-project areas, after the construction. The majority of the people appreciated the idea of rehabilitating the roads.

A summary of the meeting is provided in the table below:

Table 8-7 Consultation with Business Community, Urdu Chowk

S. No	Name	Recommendations/Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	Water is the basic necessity; children of the area are deprived of it. The area is also devoid of safe drinking water for domestic use. The biggest problem to address first, is the water and sewerage situation, without these two lives comes to stand still. Any organization can be involved for improving the area, even if it is not the domain of the consultant and KNIP, the required issues will be discussed by the local community and need to be tackled and addressed.	The issue will be addressed. All the utility stakeholder has been taken on board to work in collaboration, so that the water and sewerage related issues are resolved for the betterment of the area. The responsibility of water and sewerage is of KWSB. Rehabilitation of roads is the responsibility of KNIP and the consultant. The KW & SB is already been informed about the situation so that the work begins simultaneously.	No design modification is required.
2.	Respondent 2	When all the roads starting from Saudabad will be rehabilitated, the areas will become beautiful. People will start taking the ownership of the area, when something good will be made. It will facilitate the families living in the area so automatically everyone will take care of the area. First the water and sewerage lines need to be laid.	The placement of trash cans in a secure place, and collection of solid waste on daily basis will be ensured with the concerned authorities, which includes DMC. But the responsibility to throw the solid waste inside the trash cans will be of the residents and the community doing business in the emergency sub-project areas.	No design modification is required.

3.	Respondent 3	Houses are affected due to sewerage problem in the sub-project areas.	The points were noted	No design modification is required.
4.	Respondent 4	The area does not have water supply in the past 35 years There is no solid waste dumping station	The concept design is shared. There will be no decoration done from the outside, first the underground issues will be resolved because if there is no proper drainage system available, the road will revert to its previous condition. The concerned authorities are in coordination.	No design modification is required.

8.2.7 Consultation Meeting with Liaquat Govt. Degree Girls College

The consultation meeting was held with the female teachers and assistant professors of the College, regarding KNIP's interventions in the emergency sub-project areas. The meeting was conducted at the Staff Room of the Liaquat Govt. Degree Girls College on the road from Saudabad Chowrangi to Kala Board.

It was observed in the public consultation meeting that the female teachers of the emergency sub-project areas were in favor of rehabilitating the road from Saudabad Chowrangi to Kala Board.

- They agreed on the need for good plantation in the sub-project areas and its maintenance.
- Suggested the idea of public awareness program to own plants and take responsibilities of plants.
- Emphasized on the need to build proper speed breakers and pelican crossings. The idea of developing RCD football ground and a play area for children was highly appreciated.
- Suggested the role of law enforcement in ensuring the maintenance of infrastructure. Sewerage issue needs to be addressed by placing proper pipelines connecting to the Nala, before constructing the road, to avoid further inconvenience for the users. Proper dumping station for solid waste disposals is required.
- The roads are covered with the garbage due to which only one road is used for two-way traffic.
- Appreciated the idea of proper parking area for the buses and the ambulances. Almost everyone appreciated the initiative by KNIP and idea of the proposed concept design.

A summary of the meeting is provided in the table below:

Table 8-8 Consultation with teachers/ professors and design modifications

S. No	Name	Recommendations/Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	There is a need for good plantation in the emergency sub-project areas and sustainable maintenance. The Neem tree, Gossypium, and some other flowering plants will be of great benefit and will prove best for the décor of the sub-project areas. Suggested the idea of public awareness program to own plants and to take care of the plantations.	The consultant agreed and told the proposed plantation ideas are in the concept design as well as the selection of the trees will be for the benefit. Teachers are great influencers to create awareness. Joint awareness campaigns can be arranged at the college venue.	No design modification is required.
2.	Respondent 2	Emphasized that there were no proper speed breakers and pelican crossings.	The consultant showed the proposed designs of speed breakers and pelican crossings.	No design modification is required.
3.	Respondent 3	Appreciated the idea of developing RCD football ground and a play area for children.	No response required.	No design modification is required.
4.	Respondent 4	Appreciated the idea of rehabilitating the sub-project areas and the concerns about the improvement of lifestyle of the locality. Suggested the role of law enforcement in ensuring the maintenance of infrastructure.	No response required.	No design modification is required.
5.	Respondent 5	Suggested to fix the sewerage issue by placing proper pipelines connecting to the Nala, before construction of the road begins, to avoid further inconvenience for the residents.	The consultant told the respondents that meetings with the KWSB was already done	No design modification is required.

			considering this issue.	
6.	Respondent 6	Suggested the proper dumping station for solid waste disposals. The roads are covered with the garbage and only one road is used for two-way traffic.	The concerned authorities have been approached and the work will be done with the collaboration of DMC to address the issue.	No design modification is required.
7.	Respondent 7	Appreciated the idea of proper parking area for the buses and the ambulances.	No response required.	No design modification is required.
8.	Respondents 8	Appreciated the idea of the proposed concept design. Emphasized that the on ground work should start as soon as possible. Appreciated the initiative by KNIP and the concept design of the roads and public places.	The consultant will make sure to start on ground work as soon as possible.	No design modification is required.

Figure 8-12 Consultation with Govt. Degree Girls College

8.2.8 Consultation Meeting with Smart Kids Schooling System

The public consultation meeting with female community of Malir area, represented by teachers and residents, was organized by the consultant to aware the community about the Karachi Neighborhood Improvement Project (KNIP) and its interventions. The meeting also aimed to get the feedback and suggestions of the participants for any modification in the Emergency Sub-Projects design.

The public consultation meeting it was observed that the people of the emergency sub-project areas were in favor of rehabilitating the road from Saudabad Chowrangi to Nade Ali to Jinnah Square.

- The majority of the people appreciated the idea of the proposed concept design. Everyone was concerned about unavailability of water for domestic use.
- There are no trash cans placed in the area and all the solid waste is dumped on the roads. If the roads are reconstructed, it may revert to its previous condition due to unavailability of trash cans.
- The solid waste issue is the most important step to sustain the good condition of roads.
- Parks are for leisure, residents have to be at peace from the availability of basic facilities first, then comes the need for the parks.
- Female residents complained about unavailability of walkways and the existing walkways are blocked due to hawkers, which cause difficulty for them to commute.

A summary of the meeting is provided in the table below:

Table 8-9 Consultation with teachers/ residents/ children and design modifications

S. No	Name	Recommendation/Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	The area is devoid of safe drinking water for domestic use, which unprecedentedly is affecting the health of locals. Water unavailability issues to be addressed in the proposed design.	All the utility stakeholder has been taken on board to work in collaboration, so that the water related issues are resolved for the betterment of the area. The KW & SB is already been informed about the situation.	No design modification is required.
2.	Respondent 2	Solid waste disposal situation was discussed. Respondent informed that since there are no trash cans placed in the area, the solid waste is thrown on the roads. If the road is reconstructed, it will revert to its previous condition because of unavailability of trash cans.	The placement of trash cans in a secure place, and collection of solid waste on daily basis will be ensured with the concerned authorities, which includes DMC. But the responsibility to throw the solid waste inside the trash cans will be of the residents	No design modification is required.

			and the community doing business in the emergency sub-project areas.	
3.	Respondent 3	The problem addressed was the current situation of roads, which are in bad condition according to the residents. The people who have a reasonable vehicle, are hesitant to drive on the existing roads or visit the area because of the damage done to their property. According to the residents, if the roads are made, 50% of the problems will be solved. The rest of the 50% problem will remain which is related to water and electricity. If the above-mentioned issues are not addressed, how can one go to the park and have leisure time.	The rehabilitation of the emergency sub-project areas is the main objective of KNIP which includes the development of new roads but water and electricity issues are not in the mandate of KNIP and the consultant. The only thing is that concerned authorities will be approached to corporate. KSWB has committed to put new water lines and resolve sewerage issues before the roads are made. If electricity is affected due to the project then the consultants and KNIP are answerable and there to help.	No design modification is required.
4.	Respondent 4	Water supply is the main issue of the emergency sub-project areas. If the parks and green spaces need to be maintained, water will be required and area does not have a proper water supply system.	The concerned points have been noted.	No design modification is required.
5.	Respondent 5	The female residents of the emergency sub-project areas face difficulties while walking and moving in the area due to solid waste disposed on road sideways/walking paths and	Take responsibility as residents of the area to request the hawkers/ mobile hawkers to avoid doing business in the	No design modification is required.

		hawkers doing business in the way.	walking area and to create difficulties for the pedestrians to move around. Campaigns can be done against them.	

Figure 8-13 Consultation with Smart Kids Schooling System

8.2.9 Consultation Meeting with residents and players at the RCD Ground

The public consultation meeting with male residents of Malir areas, represented by football players and residents, was organized by the consultant to aware the community about the Karachi Neighborhood Improvement Project (KNIP) and its interventions. The meeting also aimed to get the feedback and suggestions of the participants for any modification in the emergency sub-project designs. The meeting was conducted at the RCD Ground.

- It was observed in the consultation meeting that the people of the emergency sub-project areas were reluctant and were not in favor of play area in the football ground.
- The majority of the people including the residents and the football players were in favor to make RCD a proper football ground. On the other hand, the community gave suggestion to rehabilitate the existing parks in the emergency sub-project areas.

A summary of the meeting is provided in the table below:

Table 8-10 Consultation with football players/ residents and design modifications

S. No	Name	Recommendation/Suggestions	Action to be taken	Design Modifications
1.	Respondent 1	Explained the proposed concept design for the rehabilitation of RCD Ground. Explained the concept of suggested play area and futsal ground.	No response required.	No design modification is required.

2.	Respondent 2	Suggested to develop RCD ground as a green space with no play area or football ground.	The ground has to be inclusive. It should be a place for everyone including male, female, and children of all age groups.	No design modification is required.
3.	Respondent 3	Suggested that there should be the walking trails around the football ground to walk.	The consultant showed the proposed walking trails in the concept design.	No design modification is required.
4.	Respondent 4	Suggested that there should be proper benches and lightening in the ground.	The benches and lightening are already incorporated in the concept design.	No design modification is required.
5.	Respondent 5	Suggested toilets for children and females in the park area.	The consultant showed the proposed toilets in the concept design.	No design modification is required.
6.	Respondent 6	Showed concern about the football ground that it may not have enough space after 18 ft. space for the roads, boundaries, and the play area.	The 18 ft. space for road is essential for the movement of the cars.	Any design modification is subject to approval of the client.
7.	Respondent 7	Suggested that it should be just a football ground. Parks are already available, suggested to rehabilitate exiting parks of the area.	The consultant and the KNIP team will discuss this matter.	Any design modification is subject to approval of the client.
8.	Respondent 8	All the football players suggested that it should be only the football ground, with proper audience seating area and lightening. No play area should be there, it should be developed as a proper football ground for tournaments.	The consultant and the KNIP team will discuss this matter.	Any design modification will be done only after sorting rational solution in line with suggestion raised by the KNIP/DMC office which highlighted the importance of football and park merged in order to create an inclusive design for the community.

Figure 8-14 Consultation with Residents and Players at RCD Football Ground

8.3 DISCLOSURE OF EMERGENCY SUB-PROJECTS INFORMATION

The ESMP report for the Emergency Sub-projects will be uploaded on the project websites, hard copies shall be sent to all institutional stakeholders and all DMC offices. The Sub-Project ESMP will be disclosed internally within the Bank. Before the physical work begins on the Sub-Projects, the Sub-Projects ESMP Executive Summary will be translated in local languages and communicated to all primary stakeholders including residents, students, teachers, transporters, government servants, communities/ businesses in the neighborhood and will be uploaded on the PIU website - http://www.knip.gos.pk/ or P&D website.

Chapter 9. ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

9.1 INTRODUCTION

The objective of the Environmental Management & Monitoring Plan (EMMP) is to address the major environmental issues and provide framework for the implementation of the proposed mitigation measures during the preconstruction, construction and operational phases of the proposed sub-projects. The proper implementation of the EMMP will ensure that all the adverse environmental impacts identified in the ESMP are adequately mitigated, either totally prevented or minimized to an acceptable level and required actions to achieve those objectives are successfully adopted by the concerned institutions or regulatory agencies. The implementation of EMMP should be carefully coordinated with the design and construction phases of the sub-projects to ensure that relevant mitigation measures are implemented at the appropriate stage and that adequate resources are properly allocated to achieve the desired results.

The Contractor will be responsible for the implementation of the proposed sub-projects under the direction of "Project Supervision consultant (PSC)", KNIP and GoS. The Contractor should be bound to follow the provisions of the contract documents especially about environmental protection and apply good construction techniques and methodology without damaging the environment.

9.2 REPORTING AND FEEDBACK MECHANISM

The contractor's HSE Engineer will manage the daily activities to be conducted in compliance with the EMMP and will be responsible for completion of daily checklist and monthly reporting to PSC while PSC would be responsible review of both checklist and monthly report. PSC will prepare the semiannual environmental monitoring report and submitted to the PIU. PIU will review the Semi Annual Report and submit to the WB.

Table 9-1: Reporting Requirements

Reporting responsibility	Reporting Requirement	Report submitted to
Contractor	Monthly Environmental Monitoring Report Daily Environmental Compliance Checklist	PSC
Construction Supervision Consultant (PSC)	Monthly Environmental Monitoring Report Semi Annual Environmental Monitoring Report	PIU
PIU	Semi Annual Report	WB

9.3 SUMMARY OF ENVIRONMENTAL MANAGEMENT PLANS

The **Error! Reference source not found.** provide the environmental mitigation and bservational monitoring for the Project during the design, pre-construction / construction and operational phases.

Table 9-2: Environmental Management Plan of the proposed Project

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
PLANNING AND DESIGN PHASE IMPACTS						
1.	Preference for construction material that don't contain hazardous (asbestos) materials	Medium	- Include provision in the bidding document that discourage use of hazardous construction materials especially asbestos	Design Consultant (DC)	Tender Documents	PIU
2.	Loss of Trees	Medium	- Plan for compensatory planting proportion of five trees planted for each tree cut, which is more than 10 cm (2.2) "in breast height (DBH). - Disallow introduction of invasive/exotic species and native species should be recommended for plantation.	DC	Tender Documents	PIU
3.	Public Utilities	Low	- Incorporate technical design features to minimize effect on public utilities; and - All public utilities likely to be affected by the proposed sub-projects need to be relocated well	DC	Tender Documents	PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			ahead of the commencement of rehabilitation work. - While working near water mains, KWSB will be taken on-board and KWSB site engineers will be present at the site. - Communities along the subproject road will be pre-informed and consulted before the rehabilitation work. - Provision of alternative supplies where applicable, e.g. water supply by tankers to affected communities.			
CONSTRUCTION PHASE IMPACTS						
1.	Air Quality	Medium	- Position any stationary emission sources (*e.g.*, portable diesel generators, compressors, *etc*.) as far as is practical from sensitive receptors. - Construction site including soil and material piles at the site should be barricaded to avoid material escape, generation of dust. - Road construction operations should be carefully planned and	CC	Ambient Air Quality parameters (SPM, NO, NO2, SO2, PM10, CO, PM2.5) – Mobile air quality Van will be used. Vehicular Emissions for Construction	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			scheduled and when the traffic movement is minimal e.g. early morning. - Careful handling and working under moist conditions and monsoon season will be avoided as much as possible. - Road construction operations should be carefully planned and scheduled and when the traffic movement is minimal e.g. early morning. - Careful handling and working under moist conditions and monsoon season will be avoided as much as possible. - All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins. - Carry out watering for dust control at least two times a day: in the morning, at noon, and in the afternoon during dry weather with temperatures of over 25^{o}C, or in windy weather. Avoid overwatering as this may make the surrounding muddy.		Vehicles (Smoke, CO, NOx, PM, Noise) – Mobile exhaust analysers will be used. Monitoring conducted as per SEQS.	

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Ensure proper state of maintenance of machinery and vehicles to minimize exhaust emissions. Smoke emitting vehicles and equipment shall not be allowed and shall be repaired or removed from the project. - Wherever possible, use electrically-powered equipment rather than gas or diesel-powered equipment. - Open burning of solid waste from the Contractor's camps should be strictly banned; - Air quality monitoring should be carried out as mentioned in EMMP.			
2.	Noise	Medium	- Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and workdays will be limited to less noise-sensitive times. Construction and rehabilitation activities will be strictly prohibited between 10 PM till 7 AM in the residential areas. When operating	CC	Check the Adequacy and integrity of noise barriers while monitor noise levels as per SEQ	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			close to sensitive areas (within 250 meters) such as medical facilities, the Contractor's hours of working shall be limited to 8 AM to 6 PM; - Use temporary noise barriers while working in sensitive locations in case accidence of allowable limits is expected. Placing construction metal barriers / sheets will be provided to reduce noise and dust pollution. - Give notice as early as possible to sensitive receptors for periods of noisier works such as excavation. Describe the activities and how long they are expected to take. Keep affected neighbours informed of progress. - Provide periods of respite from noisier works (for example, periodic breaks from jackhammer noise). - The weekend/evening periods are important for community rest and recreation and provide respite when noisy work has been conducted throughout the week.			

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			Accordingly, work should not usually be rescheduled during these times..			
3.	Surface and Ground Water Quality	Low	- Coordination with KE should be ensured during the relocation of transformers and an HDPE lining must be put beneath the transformer mounted poles to avoid soil contamination. - It will be ensured that the wastes generated from construction activities should be stored in a proper interim location onsite which should be adequately barricaded and covered to avoid ingress of storm water. The location of onsite waste storage site will be selected by PSC as per detailed construction plan. - Excavation material /civil works related solid waste should be disposed to KMC Jam Chakro Landfill site. - There will be no labor camp for residing the workers as local labor will be hired. Only Porta cabins of Resident Engineers and PSC staff	CC	Check surface/ground water quality parameters (pH, TDS, TSS, Oil & Grease, Turbidity, Total Hardness, As, Pb, Coliform etc.) – Grab samples will be taken and samples tested as per SEQS in EPA certified Laboratory	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			will be provided that will also serve as the shelter for labor during construction and provision of water. Therefore, no generation of wastewater will be envisaged. - The rehabilitated sewerage network will be connected to existing KW & SB network outside the subproject area. The municipal wastewater normally complies with the municipal wastewater discharge limits of SEQS and therefore it can be connected to the sewerage system.			
4.	Storm Water Drain	Moderate	- Strom water channels/side drains as included in the design should be constructed earlier to reduce flooding. - It is proposed that drain of one track will be constructed earlier and the other track will be rehabilitated at the same time to accommodate storm water discharge and eliminates flooding. - The drain while construction should be barricaded to avoid	CC	Proper management of transportation of garbage	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			falling of a person inside the trench. - Awareness programs for the public will be initiated to avoid throwing of garbage in the storm water drains during construction. - Signs will be posted over the drains to disseminate the information.			
5.	Flora	- Medium	- The indigenous trees most suited to the tract like Neem, Peepal, Alstonia, Albezia, Amaltas etc. will be used during re-plantation activities; - Effort will be made to save as many trees as possible even if they are young or poll stage. Proper irrigation and maintenance of plants will be ensured; - The number of trees planted after the rehabilitation work will be five times the number of trees removed; - Laydown areas and compounds will be sited to avoid unnecessary clearance of vegetation;	CC	Inventory for the identification of road side trees, Tree monitoring	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Flowering and fruiting trees will be planted along the road to beautify the landscape - The contractor's staff and labour will be strictly directed not to damage any vegetation such as trees or bushes. - Contractor will supply gas cylinders at the camps for cooking purposes - The contractor will be required to regularly water roadway surfaces. The spraying will be done at least two times daily or at such frequency that will be is needed to minimize impacts. - The traffic controls and speed limits must be implemented to reduce dust generation from lose soil and construction activity. - The tree plantation plan should include the plantation of native trees and Conocarpus specie must be avoided.			

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
6.	Fauna	Low	- Strict compliance of Wildlife Protection, Preservation and Conservation Act, 1975; - New and good condition machinery with minimum noise will be used in construction; - Noisy work will not be carried out in night-time so that there should be no disturbance to local birds and animals; - Borrow pits will be fenced so that no large animal can fell into these.	CC	-	PSC and PIU
7.	Disruption of Existing Public Utilities/ Infrastructure	Medium	- Incorporate technical design features to minimize effect on public utilities; and - All public utilities likely to be affected by the proposed project need to be relocated well ahead of the commencement of rehabilitation work.	CC	As per shifting plan prepared by contractor and approved by PIU/PSC	PSC and PIU
8.	Construction Camps/Camp Sites	Low	- The construction contractor will be required to assess the environmental/social sensitivity of any additional or alternative sites prior to their approval for adoption;	CC	As per plan prepared by contractor and approved by PIU/PSC	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Individual trees and shrubs of high conservation value to be marked and preserved wherever possible. - Provide adequate warnings of impeding works to all potential receptors within a 1 km corridor surrounding the ROW via public notices and local news; - Implement Waste Management Plan to include procedures for the classification, storage and disposal of all construction wastes. - State land or by land where there is a lessee could be used for Worker Camp locations.			
9.	Soil Contamination	Low	- Fuel oils and lubricants for construction machinery will be stored in covered diked areas, underlain with HDPE membrane. - Washing and maintenance of vehicles will be restricted onsite and contractor is mandated to get entry of well-maintained and cleaned machinery. - Regular inspections will be carried out to detect leakages in	CC	Inspection of Fuel and lubricant storage areas, construction site and project vehicle parking areas	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			construction vehicles and equipment. - Appropriate implements such as shovels, plastic bags and absorbent materials will be made available near fuel and oil storage areas for removal of oil and contaminated soil.			
10.	Waste Disposal	Moderate	- The solid waste generated from the camp site will be disposed-off through Municipal Committee or approved landfill site. - Burning of waste will be prohibited at sub-projects site; - Planning for disposal sites with reasonable distance from the human settlements; - Disallow siting for work camps, including waste dump sites, in a distance closer than one kilometer to any nearby community; - Incorporate technical design features for refuse collection containers at sites that would minimize burning impacts;	CC	As per Waste management plan prepared by contractor and approved by PIU/PSC	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Training of work force in the storage and handling of materials and chemicals that can potentially cause soil contamination; - Used oil should be collected in separate containers stored on impervious platform with restricted access and must be sold to licensed contractor and the burning of waste oil should be strictly restricted; - Segregating and stockpiling scarified/ milled bituminous material and reusing this material in sub grade/shoulders; - The existing wearing and base course scrap can be reused in sub-base course of the new road or disposed at Jam Chakro Landfill site via tarpaulin covered dump trucks. - Empty drums of bituminous material as well as bituminous material itself will be reused as far as possible, recycled back to the asphalt mixer or ultimately			

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			disposed at Jam Chakro Landfill site. - All hazardous waste like Paint Waste (Waste Paint, Drums and Rollers/ Brushes), will be handled and disposed through incineration via EPA certified hazardous waste contractor hired by CC. - All pipes made up of asbestos cement if discovered during rehabilitation, will be handled, transported and safely disposed to the designated landfill site through EPA certified hazardous waste contractor hired by CC. - Construction Contractor's HSE Plan shall clearly include a section on Asbestos Management that will ensure disposal in a manner that keeps the material in predominantly whole pieces to be considered non-friable. Sanding, sawing, grinding, chipping, or the use of power tools shall not be allowed. The asbestos containing pipes will be kept wet during removal and wrapped in plastic to			

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			avoid escape of asbestos fibers into the air. - Recycling of solid waste will be carried out as far as possible and practical like cement bags, empty drums, discarded bricks etc. - No wastes should be dumped at any location outside the site boundary/designated disposal site. - Training should be provided to working personnel for identification, segregation, and management of waste. - The site-specific waste management plan will be developed by CC.			
11.	Occupational Health and Safety and Emergency Response	High	- Only authorized personal should be allowed at the construction site - Identify and minimize, so far as reasonably practicable, the causes of potential hazards to workers, including communicable diseases such as HIV/AIDs and vector borne diseases;	CC	Check implementation of HSE plan throughout the sub-project activity	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Avoid stagnation of water and initiate drainage/cleanup of stagnant water; - Provide for the provision of appropriately stocked first-aid equipment at work sites; - Provide for appropriate personal protective equipment (PPE) to minimize risks, such as but not limited to appropriate outerwear, boots and gloves; safety helmets; - Provide training for workers for the use of PPE; - WB Group's Environment, Health and Safety (EHS) Guidelines (attached at the end of this document) will be implemented; - No bonded and child labor will be permitted at site; - Labor laws will be followed including Minimum Wage, Protection against harassment of women, Work Hours, Overtime Payment. - Also, laborers will be trained on appropriate interaction with local people especially women;			

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Include procedures for documenting and reporting accidents, diseases, and incidents; and - All safety precautions will be taken to address safety hazards for the nearby community. These precautions may include safety/warning signage, safety barrier around the construction site. - Lighting provided for labor during night time work should be adequate but spot lights that should not create nuisance to nearby local residence. - CC will include appropriate clauses to protect environment and public health. The sub-project ESMPs will be included in the bidding document; - There will be no labor camp for residing the workers as local labor will be hired. Only Porta cabins of Resident Engineers and PSC staff will be provided that will also serve as the shelter for labor during			

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			construction and provision of water. Therefore, no generation of wastewater will be envisaged; - The location of Porta cabins will be decided by PSC based on detailed construction plan. - WB Group's Environment, Health and Safety (EHS) Guidelines (attached at Annexure-VI) will be implemented.			
12.	Traffic Management	High	- Proper traffic management plan will be needed to avoid traffic jams/public inconvenience; - Movement of vehicles carrying construction materials should be restricted during the daytime to reduce traffic load and inconvenience to the local residents; - Coordinated planning of traffic diversions by the traffic police and the Transport Department in accordance with the construction programme with advance warnings to the affected residents and road users;	CC	Flow of routine traffic	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			- Construction vehicles, machinery and equipment will move or be stationed in the designated ROW to avoid un-necessary compaction of soil; - Availability of continuous services of the police in the diversion and control of traffic; and - The executing agency is required to maintain liaison between the Highway/ Traffic Police, local residents/ travellers and the contractor to facilitate traffic movement during construction stage.			
13.	Communicable Diseases	Moderate	- Arrange to run an active campaign, in the labour camp, to make people aware of the cause, mode of transmission and consequences of COVID-19 and HIV/AIDS; - SOPs related to the disinfection and environmental decontamination advised by National Action Plan for COVID-19 Pakistan to control spreading of COVID-19, shall be implemented	CC	Weekly monitoring during the subproject activity	PSC and PIU

S. No.	Aspect	Potential Significance	Mitigation measures	Mitigation Responsibility	Monitoring Parameters/ Location	Monitoring Responsibility
			by the contractor and should be strictly monitored; - Strengthen the existing local health and medical services for the benefit of labour as well as the surrounding communities; - Ensure cleanliness and hygienic conditions at the labour camp by ensuring proper drainage and suitable disposal of solid waste. Inoculation against Cholera will be arranged at intervals recommended by the Health Department; - Locating a labour camp at least away from the local settlement - Keep all the camps, offices, material depots, machinery yards and work sites open for the inspection of health and safety measures and related documents.			

9.4 ENVIRONMENTAL TRAINING PLAN

An environmental trainings program will help to ensure that the requirements of the EMMP are clearly understood and followed by all project personnel. The primary responsibility of providing these trainings to all project personnel will be that of the contractor and PSC. The trainings will be provided to different professional groups separately such as managers, skilled personnel, unskilled labors, and camp staff.

Table 9-3: Training of Institutions involved in Environmental Compliance

Level of Training	Responsibility	Contents
Project Induction	PSC	Overview of environmental policy of Project, Environmental approval conditions, response to environment incidents, PPEs, Environmental receptors, environmental conformances. Sanitation and Healthcare
Field talks	Construction Contractor	Environmental aspect of managing waterways crossings, soil erosion and sedimentation control, dust & noise control, wild life protection, safety of workers, waste management etc.
Capacity Building of GoS, PIU, Contractor, and PSC officials	International consultant to develop the training material and conduction	ESMF. WB's policies, Environmental laws, Monitoring & Evaluation of EMMP, EHS guidelines, Standards, Institutional responsibilities, reporting & feed back

9.5 TREE PLANTATION PLAN

Recent international practices suggest that replacement at a minimum rate of 10:1 for trees would be appropriate given possible difficulties with establishing trees and low survival rate of young trees. It is important to recognize that the placement ratio should allow for a high mortality rate among the newly planted trees based on observation, international expectations, and advice from the Sindh forest department. Pakistan has two seasons to initiate plantation work:

- Spring plantation – starting from Feb15 until April15; and
- Monsoon plantation - starting fromJuly15 until September 15.

If the tree compensation works done during above mention periods have more chances of success and the operation would be more cost effective. Furthermore, post plantation carries of utmost importance, and has been considered as deriving force for success.

The sapling of trees will be planted by Forest Department through GoS. The types of trees to be planted are shown in Table 9-4.

Table 9-4: Species recommended for the Plantation

#	Recommended Plant Species	Common Name	Occurrence
1.	*Calotropis Procera*	*Aak*	Indigenous

#	Recommended Plant Species	Common Name	Occurrence
2.	*Aristida Depressa*	*Lamb*	Indigenous
3.	*Acacia nilotica*	*Kikar*	Indigenous
4.	*Zizipus Mauritiana*	*Beri*	Indigenous
5.	*Tamarlx Aphylia*	*Farash*	Indigenous
6.	*Albizzia lebbek*	*Sharin*	Indigenous
7.	*Ficus religiosa*	*Pipal*	Indigenous
8.	*Ficus bengalansis*	*Bohr*	Indigenous
9.	*Moringa oleifera*	*Drumstick (sohanjana)*	Indigenous
10.	*Azadirachta indica*	*Neem*	Indigenous

9.6 POST MONITORING MEASURES

Section 11 of Sindh Environmental Protection Act, 2014 which is the prime legislation on environmental protection and enforcement of environmental measures states that: *"no person shall discharge or emit or allow the discharge or emission of any effluent, waste, pollutant, noise or any other matter that may cause or likely to cause pollution or adverse environmental effects, in an amount, concentration or level which is in excess to that specified in Sindh Environmental Quality Standards"*.

The SEQS are applicable for Sindh Environmental Industrial Wastewater, Effluent, Domestic Sewerage, Industrial Air Emission, Ambient Air, Noise for vehicles, Air Emissions for Vehicles and Drinking Water Quality Standards 2015 vide Notification No. EPA/TECH/739/2014 and defines threshold limits that will signal the need for corrective actions. Also, the existing baseline conditions of the subproject road as defined in this ESMP will be added in the threshold limits to compare the monitoring results with actual situation.

9.6.1.1 Proposed Corrective Measures

If the monitoring parameter results crosses the prescribed threshold limits as defined in the above section, following corrective action are proposed to be taken to ensure the environmental protection and improve the effectiveness of mitigation measures:

Table 9-5: Post Monitoring Measures

S #	Trigger of Corrective Action	Proposed Corrective Action
1.	Ambient Air Quality parameters including dust (SPM) exceeds SEQS limits	- Check water sprinkling frequency and audit the construction site for any emission sources - Check the adequacy of dust containment measures and replace the mesh sheets with jute fiber - Increase the frequency of water sprinkling - Prohibit melting of bitumen near residential areas - Use of ready mix material like crush mixed with bitumen
2.	Vehicular Emissions for Construction Vehicles exceeds SEQS limits	- Check maintenance records of construction vehicles - Prohibit vehicles which do not satisfy SEQS limits for exhaust emissions and noise
3.	Surface/ground water quality	- Audit the construction site and check wastewater streams emerging the construction site.

S #	Trigger of Corrective Action	Proposed Corrective Action
	parameters exceeds SEQS limits	- Check measures for the collection and treatment measures of these streams and arrange further measures like decommissioning of soakage pit and collection of wastewater from septic tank through bowser and discharge into nearest sewerage system. Also increase the capacity of septic tank and compartments.
4.	Ambient Noise (dB(A)) exceeds SEQS limits	- Check the vehicle maintenance records and prohibit vehicles which do not satisfy SEQS limits for noise. - Apply more noise barriers while considering the access of pedestrian will not be hindered.
5.	Accidents and disease problems of labor	- Conduct accident investigation and consult for corrective actions - Apply administrative controls or if appropriate engineering controls that requires less labor.

Chapter 10. SOCIAL MANAGEMENT AND MONITORING PLAN

This Chapter presents the positive social impacts of the sub-projects along with a comprehensive Social Management and Monitoring Plan (SMMP) for the proposed sub-project.

10.1 POSITIVE SOCIAL IMPACTS OF SUB-PROJECTS

The impacts of Socio-Economic are mostly beneficial, which includes mobility, improvisation of sewerage and sanitation system, hygiene of the roads as well as reduce noise and air radiations after construction of the roads. The benefits of impacts are described hereunder:

- It is mentioned earlier in the report that the economic and productive activities generated in Karachi have been disturbed due to numerous issues, which mainly include the poor and neglected infrastructure. Therefore, maintaining and improving the infrastructure of the city will contribute towards better and improved economy in Karachi.
- The development will save time of the commuters using the sub-project roads and the surrounding area.
- The development of footpaths/ sidewalks, pelican/ zebra crossing and speed breakers for people considering handicapped at the sub-projects' roads will directly benefit to women, children, handicapped and elderly people.
- The project will generate job opportunities for the local communities and residents. The proposed sub-projects will upgrade the value of the sub-projects area.
- Due to the improvement of the local road network, and improved bus facilities, pedestrians will benefit including women and children.
- The project is likely to address following sustainable development goals (SDGs) of the United Nations (UN):
    - **SDG-3 – Good Health and Well-Being**: The project would improve public urban spaces. Consequently, the transportation will be more manageable and orderly. Hence, the resulting infrastructure would promote Good Health and Well-being by improving the ambient air quality.
    - **SDG-8 – Decent Work and Economic Growth**: Infrastructure improvement will eventually lead to economic growth and enhancement of income generation activities.
    - **SDG-9 – Industry, Innovation and Infrastructure**: The goal directly coincides with the project intervention activities for resilient infrastructure development.
    - **SDG-11 – Sustainable Cities and Communities**: The sub-projects will result in Karachi being more sustainable and the communities being more inclusive, safe and livable.

The below table presents mitigation measures of each adverse Socio-Economic effects and monitoring parameters with responsibilities defined separately for each aspect.

Table 10-1 Social Mitigation and Monitoring Plan

S#	Socio-Economic Effect A	Potential Significance B	Mitigation Measure(s) C	Mitigation Responsibility D	Monitoring Parameters E	Monitoring Frequency F	Monitoring Responsibility G	Cost and Source of Funds H
1.	Mobility of women and physically disabled persons along sub-projects roads	High	Adequate crossing facilities during construction will also be provided by taking care of them . Due to the improvement in local road network, and improved bus facilities, pedestrians including women, children and physically disabled persons have better access to crossing facilities and walkways.	& CC	Monitoring of crossing facilities and diversions	Weekly	PSC	Nil
2.	Interruption of Utilities	High	Relevant institutions such as KE and KWSB should be well-informed and taken on-board	CC and & Communication Specialist	Coordination with utility agencies and communities and incorporation of	During rehabilitation of utilities	PSC	Nil

			beforehand and during the commencement of any activities and their recommendations should be well-incorporated. Communities near sub-projects area will be pre-informed and consulted if cutting down these utilities is necessary. Communities and businesses near sub-projects area will be informed beforehand if disruption of utilities will occur. A communication plan including schedule of interruption will be made by CC in association with PIU Communication specialist.		recommendations provided by them			
3.	Restriction of access and	Medium	It will be ensured that the construction site	CC	traffic diversion sites, check	Weekly	PSC	Cost of hard

	impediment of locals to resources		is appropriately cordoned off with hard barricade and also it will be ensured that safe and continuous access to all adjacent shops and residences during construction will be provided. It is estimated that to cover all the construction sites of 6 month long emergency Subproject areas, 5.6 km long barricade will be required. However, work on all areas of sub-projects shall not be underway at once and will be planned as per detailed construction plan. Traffic management plan will be developed by CC based on the		access routes of pedestrians, check traffic management plan and construction sites, check consultation records			barricade will be included in Contractual Cost borne by Contractor and will be assessed after finalization of construction plan

			detailed construction plan. Provide alternative traffic arrangement/detours, if necessary, so that traffic can be distributed and move on different roads; and, ensure that public/residents association is informed about such traffic diversions.					
			Provide information to the public through media – daily newspapers and local cable television (TV) services about the need and schedule of work, and alternative routes. Leaflets on road diversions and traffic rerouting will be disseminated to residents, nearby	Communication specialist		Before the start of interventions and during	PSC	Nil

			shops and institutions.					
4.	Impacts on Women, Children, and Vulnerable Groups	Low	In awareness raising, women should be targeted. Ensure participation of women in sub-projects activities through consultations, to ensure planned investments take the well-being of such groups into consideration	PSC reporting to PIU	Consultation records, awareness raising records	Monthly	PSC	Nil
5.	Project development not informed by concerns/views, participation of women and other groups.	Low	Identify all direct and indirect stakeholders Hold meetings with all community groups, wherever possible, using women to encourage participation of women in all stages of the sub-projects. Identify the communication mechanisms	PSC reporting to PIU	Consultation records, awareness raising records	Monthly	PSC	Nil

			most commonly used by women and ensure these are used to impact and receive information throughout the project.					
6.	Labor Issues	Low	Preference will be given to labor from locally skilled and unskilled workers of Karachi. No bonded and child labor will be allowed at site; Major labor laws will be followed e.g. Minimum Wage, Hours of work, Overtime Payment; harassment of women in the workplace. Also, laborers will be trained on appropriate interaction with local people especially women;	CC	Occupational health and safety of labour including PPE, consultation records	Daily	PSC	Nil

			Prepare Labor Health and Safety Management plan defining the roles and responsibility of personnel who implement the plan	CC	Review and check the adequacy of the plan	Before the commencement of civil works	PSC	Nil
			Ensure that Job Hazard Analysis (JHA) is performed prior to commencing jobs and sign off by PSC	CC	Review and check JHA and sign off	Before the commencement of job	PSC	Nil
			Allocate ESS staff as per site-specific plans made by the CC	CC	Check CC staffing details	Before the commencement of civil works	PSC	Nil
			WB Group's Environment, Health and Safety (EHS) Guidelines (attached at the end of this document) will be implemented	CC	Audit WB EHS guidelines provisions	Monthly	PSC	Nil
			Only labor trained to use construction equipment and machinery at site	CC	Check Training Certificate	At the time of induction	PSC	

			should be allowed to operate					
			The PSC will include appropriate clauses to protect environment and public health. The present ESMF will be included in the bidding document.	PSC	Appropriate clauses in the bidding documents will be checked by supervision/monitoring consultant	At the finalization of Contractor(s)	PIU ESS staff	Nil
			Avoid stagnation of water and initiate drainage/cleanup of stagnant water.	CC	Supervision consultant will check signs of water accumulation at construction site	Fortnightly	PSC	Nil
			Ensure the provision of appropriately stocked first-aid equipment at work sites;	CC	Supervision/monitoring consultant will check First aid measures at construction site	After every accident, incident or a near miss	PSC	Included in Contractual Cost borne by Contractor
			Ensure the provision of appropriate personal protective equipment (PPE) to minimize risks,	CC	Supervision/monitoring Consultant will check provision of PPE for construction workers	Daily	PSC	Included in Contractual Cost borne by

			such as but not limited to appropriate apron/coverall, boots and impervious gloves; eye protection and safety helmets;					Contractor
			Provide training for workers for the use of PPE;	CC	Check training records	Monthly	PSC	Biannually, 4-day workshop @ Rs.15,000 per workshop inc. expenses
			Include procedures for documenting and reporting accidents, diseases, and incidents.	CC	Check procedures	Monthly	PSC	Nil
			Water should be sprinkled daily or whenever there is dust problem on all exposed surfaces to suppress emission of dust.	CC	Monitor Dust emissions (SPM) Monitoring conducted as per SEQS.	Daily, if required	PSC	Water sprinkling cost is included in Contractu

			Wiping and sweeping should be adopted as a continuous activity to keep the surface area of the site clean.					al Cost borne by Contractor and will be assessed after finalization sub-project plans
Note: ERU = Environment and Resettlement Unit, PIU CC = Construction Contractor(s) PSC = Project Supervision and Contractor Management Consultant MEC = Monitoring and Evaluation Consultant								

1.	Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA)	Low	The contractor shall: • Train the workers regarding Gender Based Violence and Sexual Exploitation and Abuse, Sexual Harassment (SH), Child Abuse, Human Trafficking for reducing risk of GBV and SEA. • Raise awareness among workers regarding coordination with local law enforcement and code of conduct to be signed by the workers. • Issues of Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) will also be mitigated through the GRM.	CC	Occupational health and safety of labor including PPE, consultation records	Daily	PSC	Nil

Chapter 11. IMPLEMENTATION BUDGET

All of the environmental and social management activities will be undertaken by the Contractor. Which is why, the cost of the ESMP Implementation Budget activities will be included in the Contractor Budget and Bill of Quantities (BoQs) in accordance to the procurement rules and regulations. The cost of details for the Implementation Budget is shown below in Table 10-1.

Table 11-1: ESMP Implementation Budget for Sub-Project

Activity	*Unit Cost (PKR)*	*Quantity*	*Total Cost (PKR)*	*Notes*
Trainings & Reporting				
Training workshops for PMO, CSC, Contractors & Others	250,000	2	500,000	For the period of 6 months, once every 3 months
Consultations, Reporting & Communication	500,000	2	1,000,000	For the period of 6 months, once every 3 months
Community Awareness Material in Urdu and other language Pamphlets	50	1,000	50,000	One Time
Environmental Monitoring				
Environmental Monitoring: Diesel Generators & Construction Machinery and Vehicular Exhaust Emission Monitoring	50,000	6	300,000	Monthly during Construction Period
Ambient Air Quality Monitoring (24 hrs.)	50,000	10	500,000	Once in pre-construction period, twice during construction period & twice for 1 year operation period at two (2) Sites
Noise Monitoring Meter (for PMO/CSC)	100,000	3	300,000	Procured to conduct noise monitoring on-site at intervals
Noise Monitoring (24 hrs.)	10,000	10	100,000	Once in pre-construction period, twice during construction period & twice for 1 year operation period at two (2) Sites
Drinking Water Quality Monitoring	20,000	5	100,000	Once in pre-construction period, twice during construction period & twice for 1 year operation period at one (1) Site
Ground Water Quality Monitoring	20,000	5	100,000	Once in pre-construction period, twice during construction period & twice for 1 year operation period at one (1) Sites

Waste Water Quality Testing	20,000	5	100,000	Once in pre-construction period, twice during construction period & twice for 1 year operation period at one (1) Site
Mobilization Charges for Environmental Quality Monitoring	5,000	10	50,000	Each time the movement required hence calculated on the air & noise quality monitoring frequency for the entire period
Roadside Plantation of Native Species @ 10 Saplings / in replaceable of Each Tree Affected	500	2,050	1,025,000	Cost for Tree Plantation include (Layout/Site Clearance, pit, alignment and digging of earth, pit enrichment, plant fencing, planting a tree, watering for one month)
Operational Expenses				
Traffic Management Cost through hiring of 03 traffic management personnel	40,000	18	720,000	Monthly
Environmental Health & Safety Officer, Community Liaison Officer and Grievance Redressal Officer	Lump Sum		1,000,000	One Time
PPE including: ear muffs, safety shoes, masks, gloves, safety helmets, safety vests, warning tapes and safety signage	Lump Sum		500,000	One Time
Divergence Equipment's including; Jarsy Barriers, Safety Cones, Hard barricades	Lump Sum		100,000	One Time
First Aid box (2), quality first aid medicines containing antibiotics and other seasonal medicine for seasonal diseases, flue, fever and scabies etc. (09 months) and temperature gun/infrared thermometers	Lump Sum		500,000	One Time
Fire Fighting Equipment purchase and six-monthly refilling	Lump Sum		500,000	One Time
Health & Hygiene including; provision of waste collection bins, cleaning of site and dormitory areas, use of disinfectants and solid waste management	Lump Sum		300,000	One Time
Medical masks, sanitizers and soaps (kit per head)	Lump Sum		200,000	One Time

Grand Total		**7,945,000**	

Note: Indicative figures. Subject to change

The total cost is **PKR 7.945 million**.

Chapter 12. CONCLUSION AND RECOMMENDATION

12.1 CONCLUSIONS

This ESMP study reveals that the proposed sub-projects will not lead to significant adverse environmental and social impacts of such nature or magnitude that would require a more detailed report in the form of an EIA. Furthermore, careful implementation of the ESMP will ensure that environmental impacts are managed, mitigated and minimized and the sub-projects proponent meets all statutory requirements.

Based on the preliminary design, environmental and social field surveys, and impacts assessment of the proposed sub-projects, it may be concluded that although there are some significant negative impacts but would be of short term during the construction stage. The major environmental issues related with the sub-projects Activities are summarized as under:

- Impacts like loss of trees, dust and noise etc. are of temporary nature during the site development stage. However, during construction stage transportation of material, storage, waste management and drainage congestion could become a problem which can be reduced by appropriate
- Design and mitigation measures.
- No forest area or wildlife sanctuary exists within the vicinity of the sub-projects Area, which may be affected by the sub-projects.
- The other social issues like health and safety of general public and workers, security problems, community accessibility issue, etc. will be of temporary nature and proper mitigations have been provided in EMP.
- A comprehensive EMP has been developed identifying the impacts, mitigation measures, agencies responsible for implementation, monitoring and auditing of the proposed measures.
- It may be concluded that if proper mitigation measures as given in this report be implemented, the proposed sub-projects will cause the least effect on the area's existing environmental and social setting. On the other hand, it is expected that Project will generate employment opportunities to the residents of the area.

12.2 RECOMMENDATIONS

Although comprehensive mitigation measures have been proposed in the report to minimize the negative impacts and to enhance the positive impacts of the Project, however, major recommended mitigation measures are summarized as under:

- Soil erosion, water contamination, air pollution and high noise levels should be controlled with the use of good engineering practices including land management, selection of abatement devices, and use of proactive measures, selection of proper sites, etc.
- Contractor should take due care of the local community and its sensitivity towards local customs and traditions.
- EMP proposed in ESMP should be implemented in the true spirit.
- Appropriately stocked first-aid equipment at work site, including appropriately trained first aid staff on site and adequate transport facilities for moving injured persons to nearby

Hospital will be available. Proper training of maintaining environment, health and safety should be given to Project management unit in both constructions an operation phase.

- Contractor shall be made responsible through contract documents to follow Sindh Environmental Quality Standards (SEQS) for air quality monitoring, noise level monitoring and water quality analysis, international EHS guidelines to assess and manage EHS impacts and risks eliminate the cause of the hazard at its source through the implementation of regular EHS training programs, WB guidelines and other applicable standards throughout construction and maintenance work to ensure compliance of proposed sub-projects' activities.
- Contractor shall be made responsible through contract documents for proper disposal of the waste generated during the activities. Waste will not be left unattended along the construction site.
- The Project proponent and construction contractors required to develop a strategy for local community engagement for complaints and suggestions through proper implementation of GRM.

It is therefore submitted that by keeping in view the importance of the project for the general public this ESMP study may be approved to provide faster, safer and environmental-friendly facility to the commuters and a new avenue of development in this deprived area.

ANNEXURE I – NOC

OFFICE OF THE
MUNICIPAL COMMISSIONER
DISTRICT MUNICIPAL CORPORATION KORANGI
D.C Korangi Office Near Total Petrol Pump Korangi # 2½
Karachi Ph#99264402

No. M.C/DMC/K/958/2021 Dated: 11/11/2021

To,

The Social Development Specialist,
Karachi Neighborhood Improvement
Project Planning & Development Department
Government Of Sindh.

SUBJECT: **NO OBJECTION CERTIFICATE (N.O.C) FOR EMERGENCY SUB-PROJECTS WORKS IN KORANGI UNDER KARACHI NEIGHBORHOOD IMPROVEMENT PROJECT PLANNING & DEVELOPMENT DEPARTMENT GOVERNMENT OF SINDH.**

Reference: P&D/PIU-KNIP/SDS/627-21/1152 Dated 15-10-2021

This DMC Korangi has no Objection to carry out developing schemes and for the execution of the schemes in the interest of the peoples of the area. It is also certified that schemes of similar nature have not been / will not be under taken by any other federal / provincial development Programme in the same location / site.

Moreover, the execution agency makes sure on affidavit to rebuild those areas which are effected during the process of execution of the development schemes. The details of schemes is as following.

Therefore this DMC Korangi has No Objection and authorizes KNIP to execute this scheme.

S#	Name of Schemes	Remarks
1	Road Nad e Ali graveyard chowk	No Objection to carry out the work
2	Malir RCD Ground	No Objection to carry out the work
3	Road from Saudabad chowrangi to Urdu chowk Bus stop on Liaquat Market Road	No Objection to carry out the work

This issued with the approval of Competent Authority.

MUNICIPAL COMMISSIONER
DISTRICT MUNICIPAL CORPORATION
KORANGI

Copy Submitted
1. The Deputy Commissioner, District Korangi.
2. The Administrator, DMC Korangi.
3. The Executive Engineer (Concerned Zone)
4. Office Copy

ANNEXURE II - ENVIRONMENTAL COMPANY PROFILE AND QUALITY REPORT DATA

Sustainable Environmental Service SES

SUSTAINABLE ENVIRONMENTAL SERVICES (SES)

ENVIRONMENTAL MONITORING, INSPECTION, TRAINING AND LABORATORY DIVISION

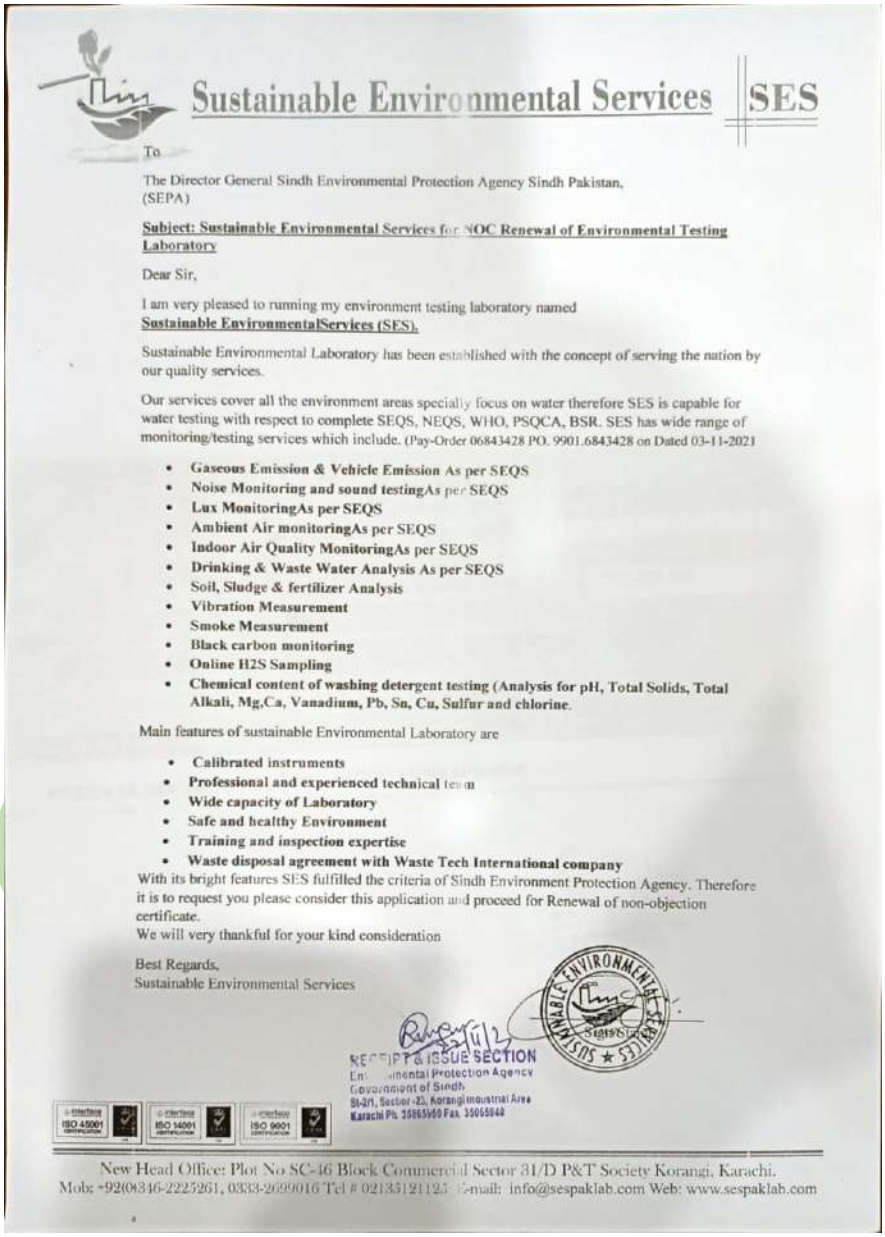
ISO, 9001:2015, 14001:45001 & 45001:2018 certified.

HEAD OFFICE: PLOT # 46, SECTOR 31/D P & T SOCITY, NEAR SHAN CHORANGI KORANGI INDUSTRIAL AREA KARACHI PAKISTAN

MOB: +92(0)346-2225261, 0333-2699016 TEL # 02135121125

LAHORE OFFICE- 94-M-2, EDEN TOWER MAIN BLUE WARD ROAD GULBARG-3 LAHORE. 0334-2222-5261

E-MAIL: INFO@SESPAKLAB.COM, HTTP://WWW.SESPAKLAB.COM



Sustainable Environmental Services SES

To

The Director General Sindh Environmental Protection Agency Sindh Pakistan,
(SEPA)

Subject: Sustainable Environmental Services for NOC Renewal of Environmental Testing Laboratory

Dear Sir,

I am very pleased to running my environment testing laboratory named
Sustainable EnvironmentalServices (SES).

Sustainable Environmental Laboratory has been established with the concept of serving the nation by our quality services.

Our services cover all the environment areas specially focus on water therefore SES is capable for water testing with respect to complete SEQS, NEQS, WHO, PSQCA, BSR. SES has wide range of monitoring/testing services which include. (Pay-Order 06843428 PO. 9901.6843428 on Dated 03-11-2021

- **Gaseous Emission & Vehicle Emission** As per SEQS
- **Noise Monitoring and sound testing**As per SEQS
- **Lux Monitoring**As per SEQS
- **Ambient Air monitoring**As per SEQS
- **Indoor Air Quality Monitoring**As per SEQS
- **Drinking & Waste Water Analysis** As per SEQS
- **Soil, Sludge & fertilizer Analysis**
- **Vibration Measurement**
- **Smoke Measurement**
- **Black carbon monitoring**
- **Online H2S Sampling**
- **Chemical content of washing detergent testing (Analysis for pH, Total Solids, Total Alkali, Mg,Ca, Vanadium, Pb, Sn, Cu, Sulfur and chlorine.**

Main features of sustainable Environmental Laboratory are

- **Calibrated instruments**
- **Professional and experienced technical team**
- **Wide capacity of Laboratory**
- **Safe and healthy Environment**
- **Training and inspection expertise**
- **Waste disposal agreement with Waste Tech International company**

With its bright features SES fulfilled the criteria of Sindh Environment Protection Agency. Therefore it is to request you please consider this application and proceed for Renewal of non-objection certificate.
We will very thankful for your kind consideration

Best Regards,
Sustainable Environmental Services

RECEIPT & ISSUE SECTION
Environmental Protection Agency
Government of Sindh
St-2/1, Sector-23, Korangi Industrial Area
Karachi Ph. 35065950 Fax. 35065948

New Head Office: Plot No SC-16 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mobi: +92(0)346-2225261, 0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report Report # SES/ENV/OCT/21/01031/0831-A Date: 01- Nov- 2021

Description

Site Coordinates	24.88523917 & 67.18490677	**Testing Instrument**	Air Monitoring Device
Job Date	27-Oct-2021	**Job Duration**	08:00 AM to 08:00 PM (12 Hours)
Site Location	Govt. Girls Secondary School , Baraf Khana , Saudabad , Malir , Karachi.		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Air Quality Test Report

Parameters	NO	NO_2	SO_2	CO	PM 2.5	PM 10	SPM	O_3
TIME	(40 µg/m³)	(80 µg/m³)	(120 µg/m³)	(5 mg/m³)	(75 µg/m³)	(150 µg/m³)	(500 µg/m³)	(130 µg/m³)
09:00AM	0.54	7.97	4.65	0.011	41.9	76.4	141.2	ND
10:00AM	0.99	7.64	3.97	0.029	46.8	88.4	164.6	ND
11:00AM	0.92	6.59	4.29	0.038	52.9	96.4	175.1	ND
12:00AM	0.98	8.46	6.94	0.054	72.1	106.7	201.9	ND
01:00PM	0.84	7.19	5.79	0.029	65.4	99.7	187.3	ND
02:00PM	0.79	8.23	4.99	0.031	62.5	89.9	199.5	ND
03:00PM	0.66	5.99	4.78	0.027	72.6	101.2	205.9	ND
04:00PM	0.75	8.87	4.13	0.038	63.1	121.9	218.1	ND
05:00PM	0.71	6.29	3.49	0.029	58.2	99.7	189.5	ND
06:00PM	0.63	5.49	3.16	0.027	50.0	78.9	196.4	ND
07:00PM	0.58	6.11	3.12	0.021	54.2	88.4	162.9	ND
08:00PM	0.51	5.16	2.81	0.011	49.5	80.2	142.9	ND
AVERAGE	0.74	6.99	4.34	0.028	57.4	93.98	182.1	ND

Note:

SEQS=Sindh Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Issued By : _____

ISO 45001 ISO 14001 ISO 9001

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261, 0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

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Sustainable Environmental Services SES

Analysis Report Report # SES/ENV/OCT/21/01031/0831-B Date: 01- Nov- 2021

Description

Site Coordinates	24.88523917 & 67.18490677	**Testing Instrument**	Noise Meter
Job Date	27-Oct-2021	**Job Duration**	08:00 AM to 08:00 PM (12 Hours)
Site Location	Govt. Girls Secondary School , Baraf Khana , Saudabad , Malir , Karachi.		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Noise Test Report

S. No	Measuring Parameter	SEQS Limits	Testing Method	TIME	Result	Remarks
01	Noise Back Ground (Day Time)	80 dB(A)	ASTM E-1124	**09:00AM**	65.9	WL
02				**10:00AM**	71.5	WL
03				**11:00AM**	70.5	WL
04				**12:00AM**	76.1	WL
05				**01:00PM**	73.6	WL
06				**02:00PM**	70.3	WL
07				**03:00PM**	65.9	WL
08				**04:00PM**	68.2	WL
09				**05:00PM**	73.5	WL
10				**06:00PM**	64.0	WL
11				**07:00PM**	78.9	WL
12				**08:00PM**	63.1	WL
				Average Result	70.1	WL

Note:

SEQS=Sindh Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit
OL= Out of Limit

Issued By :

AIR QUALITY SAMPLE COLLECTION DATE AND LOCATION DETAILS (M-AN-1)

Latitude	Longitude	Description
24.88523917	67.18490677	GOVERNMENT GIRLS SECONDARY SCHOOL, BARAF KHANA DR. FASIH'S ENT & GENERAL HOSPITAL SAUDABAD POLICE STATION

Sustainable Environmental Services SES

Analysis Report **Report # SES/ENV/OCT/21/01031/0831-C** Date: 01- Nov- 2021

Description

Quantity of sample	1.0 Liter	**Sampling Methodology**	Grab
Analysis Type	Chemical Analysis	**Job Date**	27-Oct-2021
Site Coordinates	24.89462709 & 67.20067053		
Sampling Location	Govt. Polytechnic Institute (Girls), Saudabad , Malir , Karachi.		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Ground Water Test Report

S #	Parameters	Units	Testing Method	Result
01	Total Bacteria Count	TBC (count/ml)	Total Viable Count	TNTC
02	Total Coliform	TC (count/ml)	APHA 922 B	TNTC
03	E-Coli	EC(count/ml)	Total Viable Count	TNTC
04	Facial Coli	FC (count/ml)	APHA 922 B	TNTC
05	Turbidity	NTU	HACH Turbidity meter	< 0.02
06	Taste	Taste	Sensory Evolution	Non-obj
07	Odour	Odor	Sensory Evolution	Non-obj
08	Colour	TCU	Pt-Co method	< 1
09	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	ND
10	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.3
11	pH @ 25 °C	PH	ASTM D-1293	7.6
12	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	1368
13	Total Hardness	As COCO3(mg/L)	APHA 2340-C	651
14	Fluoride	F^{-1} (mg/L)	APHA 4500-F^{-1}	0.89
15	Chloride	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	382.5
16	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	ND
17	Nitrate	NO_3^{-1} (mg/L)	HACH Method 8192	0.71
18	Nitrite	NO_2^{-1} (mg/L)	APHA 4500-NO_2^{-1}-B	0.04
19	Antimony	Sb (mg/L)	ASTM D-3697	ND
20	Aluminum	Al (mg/L)	ASTM D-857	0.016
21	Arsenic	As (mg/L)	ASTM D-2972	ND
22	Boron	B (mg/L)	ASTM D-3082	ND
23	Barium	Ba (mg/L)	ASTM D-4382	0.011
24	Chromium Total	Cr (mg/L)	ASTM D-1687	ND
25	Copper	Cu (mg/L)	ASTM D-1688	<0.02
26	Cadmium	Cd (mg/L)	ASTM D-3557	ND
27	Lead	Pb (mg/L)	ASTM D-3559	ND
28	Manganese	Mn (mg/L)	ASTM D-858	ND
29	Mercury	Hg (mg/L)	ASTM D-3223	ND
30	Nickel	Ni (mg/L)	ASTM D-3866	ND
31	Selenium	Se (mg/L)	ASTM D-3858	ND
32	Zinc	Zn (mg/L)	ASTM D-1691	0.11

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
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Note:

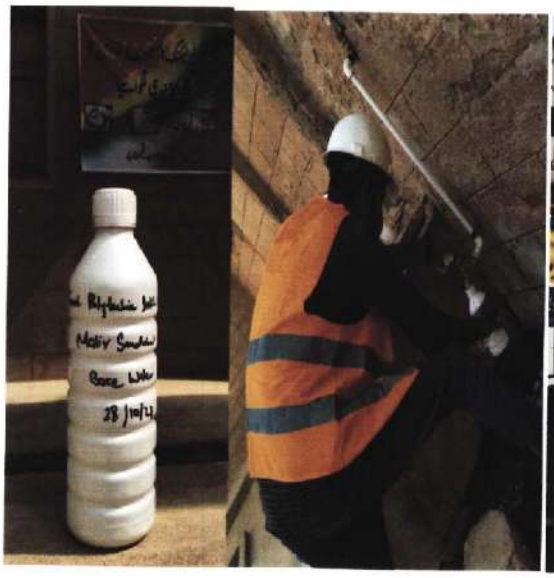
SEQS Limits= Sindh Environmental Quality Standard limits
ND= Not Detected
BDL= Below Detected Limit
TNTC=Too Numerous To Count
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported da[illegible]n future.
This report is not valid for Court evidence/ Judicial kno[illegible]dge
The measurement results based on the time of monitorin[illegible]

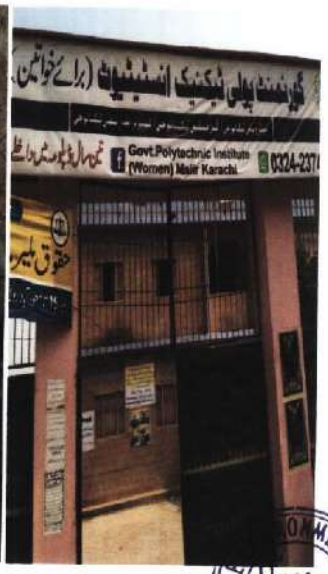
Field Analyst: Mirz[illegible]ar Baig

Cheif Chemist: Kashif Ahmed

GROUND WATER SAMPLE COLLECTION DATE AND LOCATION DETAILS (M-GW-1)

Latitude	Longitude	Description
24.89462709	67.20067053	GOVERNMENT POLYTECHNIC INSTITUTE (GIRLS), SAUDABAD, MALIR, KARACHI





Sustainable Environmental Services SES

Analysis Report Report # **SES/ENV/OCT/21/01031/0831-E** Date: **01- Nov- 2021**

Description

Site Coordinates	24.91588187 & 67.24991933	**Testing Instrument**	Noise Meter
Job Date	28-Oct-2021	**Job Duration**	09:00 AM to 09:00 PM (12 Hours)
Site Location	Crescent Grammar School ,Memon Goth Near NADRA Office , Memon Goth		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Noise Test Report

S. No	Measuring Parameter	SEQS Limits	Testing Method	TIME	Result	Remarks
01	Noise Back Ground (Day Time)	80 dB(A)	ASTM E-1124	**10:00AM**	62.5	WL
02				**11:00AM**	75.6	WL
03				**12:00AM**	74.9	WL
04				**01:00AM**	63.2	WL
05				**02:00PM**	78.6	WL
06				**03:00PM**	64.6	WL
07				**04:00PM**	63.2	WL
08				**05:00PM**	45.6	WL
09				**06:00PM**	78.0	WL
10				**07:00PM**	63.4	WL
11				**08:00PM**	55.6	WL
12				**09:00PM**	59.4	WL
				Average Result	65.3	WL

Note:

SEQS=Sindh Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit
OL= Out of Limit

Issued By : _____

SUSTAINABLE ENVIRONMENTAL SERVICES (SES)

ISO 45001 CERTIFICATION | ISO 14001 CERTIFICATION | ISO 9001 CERTIFICATION

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi
Mob: +92(0)346-2225261, 0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report **Report # SES/ENV/OCT/21/01031/0831-H** **Date: 01- Nov- 2021**

Description

Quantity of sample	1.0 Liter	**Sampling Methodology**	Grab
Analysis Type	Chemical Analysis	**Job Date**	29-Oct-2021
Site Coordinates	24.81726790 & 67.13689652		
Sampling Location	Jamia Masjid Bahar -e- Madina		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Ground Water Test Report

S #	Parameters	Units	Testing Method	Result
01	Total Bacteria Count	TBC (count/ml)	Total Viable Count	TNTC
02	Total Coliform	TC (count/ml)	APHA 922 B	TNTC
03	E-Coli	EC(count/ml)	Total Viable Count	TNTC
04	Facial Coli	FC (count/ml)	APHA 922 B	TNTC
05	Turbidity	NTU	HACH Turbidity meter	< 0.02
06	Taste	Taste	Sensory Evolution	Non-obj
07	Odour	Odor	Sensory Evolution	Non-obj
08	Colour	TCU	Pt-Co method	< 1
09	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	ND
10	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.3
11	pH @ 25 °C	PH	ASTM D-1293	7.9
12	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	741
13	Total Hardness	As COCO3(mg/L)	APHA 2340-C	274
14	Fluoride	F^{-1} (mg/L)	APHA 4500-F^{-1}	0.79
15	Chloride	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	146.9
16	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	ND
17	Nitrate	NO_3^{-1} (mg/L)	HACH Method 8192	0.47
18	Nitrite	NO_2^{-1} (mg/L)	APHA 4500-NO_2^{-1}-B	0.09
19	Antimony	Sb (mg/L)	ASTM D-3697	ND
20	Aluminum	Al (mg/L)	ASTM D-857	0.008
21	Arsenic	As (mg/L)	ASTM D-2972	ND
22	Boron	B (mg/L)	ASTM D-3082	ND
23	Barium	Ba (mg/L)	ASTM D-4382	0.008
24	Chromium Total	Cr (mg/L)	ASTM D-1687	ND
25	Copper	Cu (mg/L)	ASTM D-1688	<0.02
26	Cadmium	Cd (mg/L)	ASTM D-3557	ND
27	Lead	Pb (mg/L)	ASTM D-3559	ND
28	Manganese	Mn (mg/L)	ASTM D-858	ND
29	Mercury	Hg (mg/L)	ASTM D-3223	ND
30	Nickel	Ni (mg/L)	ASTM D-3866	ND
31	Selenium	Se (mg/L)	ASTM D-3858	ND
32	Zinc	Zn (mg/L)	ASTM D-1691	0.07

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261, 0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

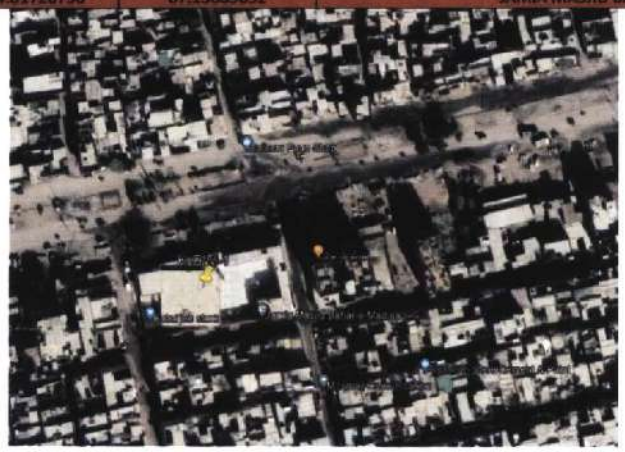
Note:
TNTC= Too numerous to count
BDL= Below Detection Limit
ND= Not Detected
SEQS=Sindh Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit
OL=Out of Limit

Field Analyst: _____
Mir M Asbar Rind

Cheif Chemist: _____
Kashif Ahmed

Ground WATER SAMPLE COLLECTION DATE AND LOCATION DETAILS (K-GW-1)

Latitude	Longitude	Description
24.81726790	67.13689652	JAMIA MASJID BAHAR-E-MADINA



Sustainable Environmental Services SES

Analysis Report Report # SES/ENV/OCT/21/01031/0831-I Date: 05 Nov 2021

Description

Quantity of sample	1.0 Liter	**Sampling Methodology**	Grab
Analysis Type	Chemical Analysis	**Job Date**	27-Oct-2021
Site Coordinates	24.911288666 &67.226817091		
Sampling Location	Waste water drain near Memon Goth		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Waste Water Test Report

S #	Parameters	Units	Testing Method	SEQS Limits	Result	Remarks
01	Temperature @ 40 °C	°C		40+≤03 °C		
02	pH @ 25 °C	pH	ASTM D-1293	6.5 to 8.5	12.0	OL
03	Color	TCU	Pt-Co method	≤ 15 TCU	4933	-
04	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	7670	OL
05	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	150	WL
06	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	3080	OL
07	Biological Oxygen Demand	BOD_5 (mg/L)	APHA 5210	80	1100	OL
08	Oil & grease	(mg/L)		10	5.8	WL
09	Phenolic compound	As Phenol (mg/L)	ASTM D-1783	≤ 0.002	35.8	OL
10	Anionic detergent	MBAS (mg/L)	ASTM D-2330	1	1.5	OL
11	Total kjeldahl nitrogen	TKN (mg/L)	ASTM D-3590	1	3.5	OL
12	Total phosphorus	TP (mg/L)	By AA	2	1	WL
13	Total coliform	TBC (count/ml)	APHA 922 B	0/100 ml	TNTC	OL
14	Molybdate reactive silica	($mgSio_2$/L)	ASTM-D-0859	50	51	OL
15	Chlorides	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	< 250	720	OL
16	Cyanide total	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.05	WL
17	Aluminum	Al (mg/L)	ASTM D-857	≤ 0.2	0.25	OL
18	Copper	Cu (mg/L)	ASTM D-1688	2	0.30	WL
19	Iron	Fe (mg/L)	APHA 3500-Fe	2	0.07	WL
20	Lead	Pb (mg/L)	ASTM D-3559	≤ 0.05	0.12	OL
21	Silver	Ag (mg/L)	By AA	5	0.05	WL
22	Nickel	Ni (mg/L)	ASTM D-3866	≤ 0.02	0.06	OL
23	Zinc	Zn (mg/L)	ASTM D-1691	5	0.2	WL
24	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	ND	WL
25	Chromium	Cr (mg/L)	ASTM D-1687	≤ 0.05	0.32	OL
26	Magnesium	Mg (mg/L)	By AA	2	18.24	OL
27	Manganese	Mn (mg/L)	ASTM D-858	≤ 0.5	0.45	WL
28	Cadmium	Cd (mg/L)	ASTM D-3557	0.01	0.02	OL
29	Barium	Ba (mg/L)	By AA	2	0.05	WL
30	Cobalt	Co (mg/L)	By AA	2	ND	WL
31	Arsenic	Ar (mg/L)	By AA	2	ND	WL
32	Selenium	Se (mg/L)	ASTM D-3858	0.01	ND	WL

Note:

SEQS=Sindh Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Field Analyst: _____
Mirza Nishat Baig

Chief Chemist: _____
Kashif Ahmed

Waste WATER SAMPLE COLLECTION DATE AND LOCATION DETAILS (M-WW-1)

Latitude	Longitude	Description
24.91128867	67.22681709	WASTE WATER DRAIN NEAR MEMON GOTH

Sustainable Environmental Services SES

Analysis Report Report # SES/ENV/OCT/21/01031/0831-J Date: 05 Nov 2021

Description

Quantity of sample	1.0 Liter	**Sampling Methodology**	Grab
Analysis Type	Chemical Analysis	**Job Date**	29-Oct-2021
Site Coordinates	24.81527781 & 67.1264595229999		
Sampling Location	Open channel drain near DHA Flats Parking		
Client Name	M/S Osmani & Co Ltd		
Client Address			

Waste Water Test Report

S #	Parameters	Units	Testing Method	SEQS Limits	Result	Remarks
01	Temperature @ 40 ℃	℃		40+≤03 ℃		
02	pH @ 25 °C	pH	ASTM D-1293	6.5 to 8.5	12.0	OL
03	Color	TCU	Pt-Co method	< 15 TCU	1811	-
04	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	4712	OL
05	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	322	OL
06	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	2470	OL
07	Biological Oxygen Demand	BOD_5 (mg/L)	APHA 5210	80	1212	OL
08	Oil & grease	(mg/L)		10	4.1	WL
09	Phenolic compound	As Phenol (mg/L)	ASTM D-1783	≤ 0.002	18.6	OL
10	Anionic detergent	MBAS (mg/L)	ASTM D-2330	1	1	WL
11	Total kjeldahl nitrogen	TKN (mg/L)	ASTM D-3590	1	2.8	OL
12	Total phosphorus	TP (mg/L)	By AA	2	1	WL
13	Total coliform	TBC (count/ml)	APHA 922 B	0/100 ml	TNTC	OL
14	Molybdate reactive silica	($mgSio_2$/L)	ASTM-D-0859	50	62.1	OL
15	Chlorides	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	< 250	510	OL
16	Cyanide total	CN^{-1}(mg/L)	HACH Method 8027	< 0.05	0.02	WL
17	Aluminum	Al (mg/L)	ASTM D-857	≤ 0.2	0.2	WL
18	Copper	Cu (mg/L)	ASTM D-1688	2	0.1	WL
19	Iron	Fe (mg/L)	APHA 3500-Fe	2	0.01	WL
20	Lead	Pb (mg/L)	ASTM D-3559	≤ 0.05	0.1	WL
21	Silver	Ag (mg/L)	By AA	5	0.01	WL
22	Nickel	Ni (mg/L)	ASTM D-3866	≤ 0.02	0.02	OL
23	Zinc	Zn (mg/L)	ASTM D-1691	5	0.2	WL
24	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	ND	WL
25	Chromium	Cr (mg/L)	ASTM D-1687	< 0.05	0.28	OL
26	Magnesium	Mg (mg/L)	By AA	2	10.6	OL
27	Manganese	Mn (mg/L)	ASTM D-858	≤ 0.5	0.20	WL
28	Cadmium	Cd (mg/L)	ASTM D-3557	0.01	0.01	WL
29	Barium	Ba (mg/L)	By AA	2	0.02	WL
30	Cobalt	Co (mg/L)	By AA	2	ND	WL
31	Arsenic	Ar (mg/L)	By AA	2	ND	WL
32	Selenium	Se (mg/L)	ASTM D-3858	0.01	ND	WL

Note:

SEQS=Sindh Environmental Quality Standards
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This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit
BDL=Below Detectable Limit
OL= Out of Limit
ND=Not Detected

Field Analyst: _____
Murad Ashar Baig

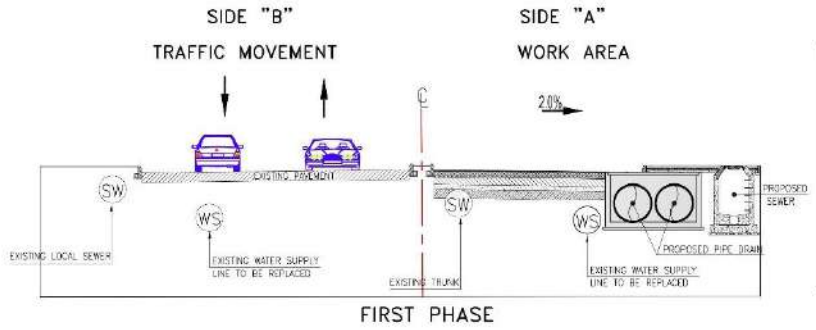
Chief Chemist: _____
Kashif Ahmed

Waste WATER SAMPLE COLLECTION DATE AND LOCATION DETAILS (M-WW-1)

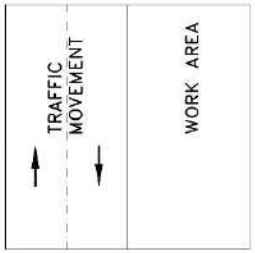
Latitude	Longitude	Description
24.81527781	67.12645952	Open channel drain near DHA Flats Parking

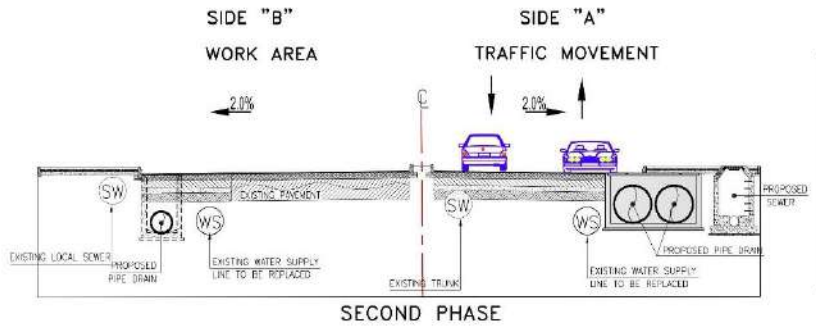
TRAFFIC MANAGEMENT PLAN

REHABILITATION OF KNIP ROADS
KALABOARD TO SAUDABAD
CHOWRANGI

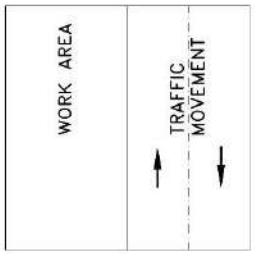


FIRST PHASE





SECOND PHASE



FIRST PHASE (Side "A"):

1. Laying of New Sewer Line with Main Holes.
2. Laying of Pipe Drain and Water Supply Line with Chambers.
3. Rehabilitation and/or Reconstruction of Existing Pavement Structure.
4. Reconstruction of Footpath.
5. Rehabilitation of Existing Street Lights

SECOND PHASE (Side "B"):

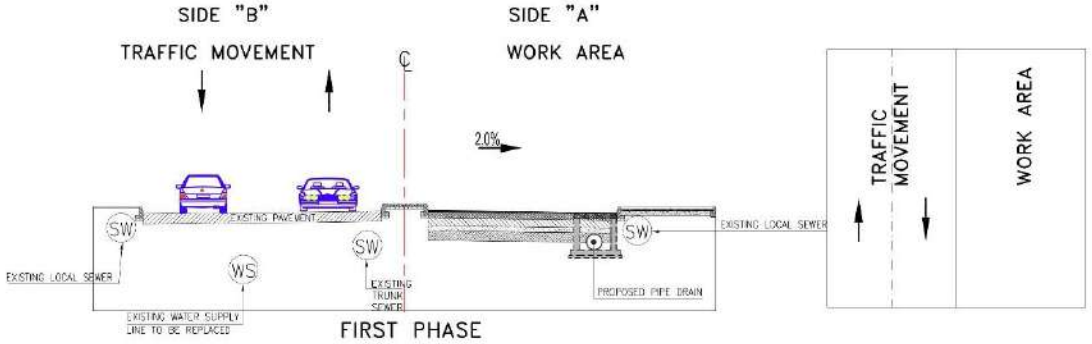
1. Laying of Pipe Drain and Water Supply Line with Chambers.
2. Rehabilitation and/or Reconstruction of Existing Pavement Structure.
3. Reconstruction of Footpath.

GENERAL NOTES:

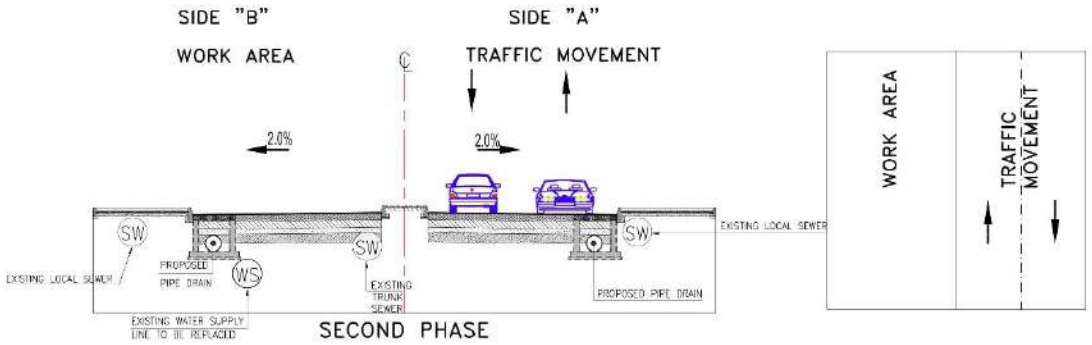
1. The traffic management scheme illustrated is representative only and the contractor may use it or propose an alternative solution.
2. The contractor is required to produce working drawings showing his proposed traffic management scheme.
3. A minimum of two traffic lanes must be maintained at all times.

TRAFFIC MANAGEMENT PLAN

REHABILITATION OF KNIP ROADS SAUDABAD CHOWRANGI TO JINNAH SQUARE



FIRST PHASE



SECOND PHASE

FIRST PHASE (Side "A"):

1. Laying of Pipe Drain with Chambers.
2. Rehabilitation and/or Reconstruction of Existing Pavement Structure.
3. Reconstruction of Footpath.
4. Rehabilitation of Existing Street Lights

SECOND PHASE (Side "B"):

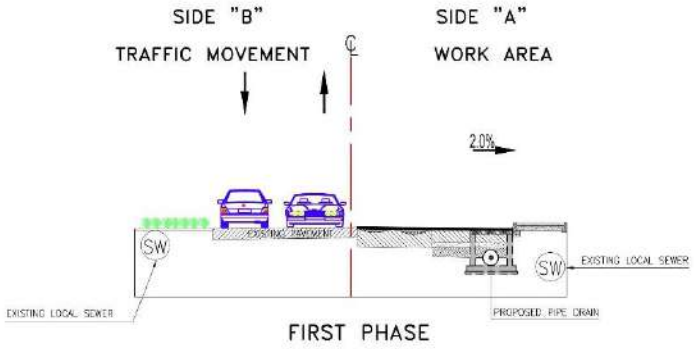
1. Laying of Pipe Drain and Water Supply Line with Chambers.
2. Rehabilitation and/or Reconstruction of Existing Pavement Structure.
3. Reconstruction of Footpath.

GENERAL NOTES:

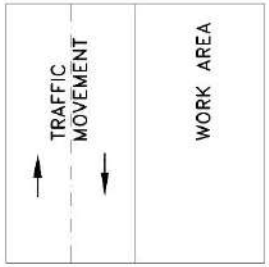
1. The traffic management scheme illustrated is representative only and the contractor may use it or propose an alternative solution.
2. The contractor is required to produce working drawings showing his proposed traffic management scheme.
3. A minimum of two traffic lanes must be maintained at all times.

TRAFFIC MANAGEMENT PLAN

REHABILITATION OF KNIP ROADS
SOOMAR KANDYANI TO MURAD MEMON CHOWK



FIRST PHASE



FIRST PHASE (Side "A"):

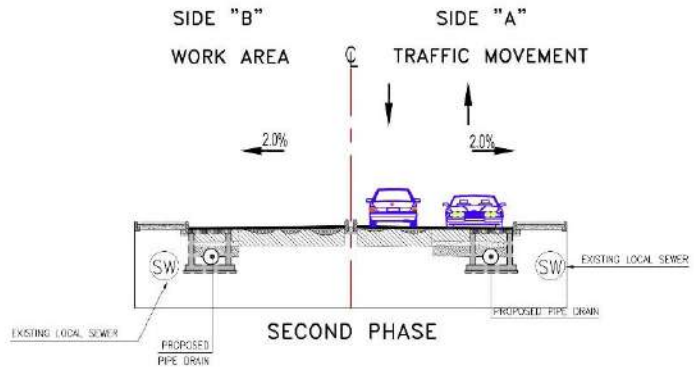
1. Laying of Pipe Drain with Chambers.
2. Rehabilitation and/or Reconstruction of Existing Pavement Structure.
3. Reconstruction of Footpath.

SECOND PHASE (Side "B"):

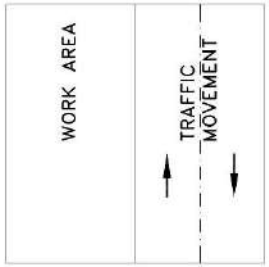
1. Laying of Pipe Drain with Chambers.
2. Rehabilitation and/or Reconstruction of Existing Pavement Structure.
3. Reconstruction of Footpath.
4. Rehabilitation of Existing Street Lights

GENERAL NOTES:

1. The traffic management scheme illustrated is representative only and the contractor may use it or propose an alternative solution.
2. The contractor is required to produce working drawings showing his proposed traffic management scheme.
3. A minimum of two traffic lanes must be maintained at all times.



SECOND PHASE



OSMANI AND COMPANY PVT LTD.

Environmental, Social & Gender Public Consultation

KNIP Neighborhoods Interventions Project

Questionnaire (Public Consultation)

Name of Interviewer:	Mavish Mazhar	Date:	18-10-21
Location:	Jinmah Square	Coordinates	--
Sub Project	Malir Area	DMC:	Korangi

1. Identification

Name:	Umair	Father's Name:	Durray Khan
CNIC:	--	Mobile No.:	03151273798
Address:	Jinnah Square		
Caste:	Yousuf Zai	Village/UC:	05
District:	Korangi	Province:	Sindh

Gender:	a) √ Male	b) Female	c) Transgender
Age:	a) 15-23	b) 36-45	c) √ 26-35 d) Above 45
Marital Status	a) √ Married	b) Unmarried	c) Divorced/Widow
Occupation	a) Main: **Gov. Job**	b) Secondary: **Private Business**	c) _____

Ownership Status:	a) √ Self	b) Rented	c) _____
Type of Property:	a) Commercial	b) Residential	c) Other **BOTH**
Type of Structure:	a) √ Pucca	b) Semi Pucca	c) Khokha
Income:	a) < 10,000	b) √ 10,000-30,000	c) >30,000
Education:	a) Illiterate	b) Primary	c) Middle
	d) √ Matric	e) Intermediate	f) Graduate

2. Descriptive Questions							
2.1 Access to Social Amenities (tick)							
Social Amenities	**Available**	**Not Available**	**Monthly Bills**	**Social Amenities**	**Available**	**Not Available**	**Monthly Bills**

Electricity	√		√	Sewerage/Drainage	√		--
Gas	√		√	BHU/ Health Care		√	--
Water Supply		√		School	√		--
Telephone		√		Drinking Water	√		--

2.2 Housing Conditions

Total area of the House	Covered area of the house	Any trees	Year of Construction	Present Value of the House
N/A	N/A	N/A	N/A	N/A

2.3 Women's Participation and Role in decision making in different Household Activities

Activities	**Participation Extent (%)**	**Decision Making Extent (%)**
Household activities	--	--
Child caring	--	--
Farm/Crop activities	--	--
Livestock rearing	--	--
Sale & Purchase of properties	--	--

Social obligations (marriage, birthday & other functions)	--	--
Local representation (councilor/political gathering)	--	--
2.4 Perceptions of Respondent for Action Associated with the Project		
Possible impacts/effects of the Project	**Increase**	**Decrease**
Employment opportunities	√	
Marketing facilities	√	
Living standard	√	
Unemployment		√
Income generating activities	√	
Electricity Availability	√	
Mobility (Access to Resources)	√	
Other	--	--
2.5 Are there any Solid waste disposals in your area?	Yes	√ No
2.6 Are there agencies available to collect the Solid waste disposals in your area?	Yes	√ No
2.7 Are there agencies available to clean the roadside in your area?	Yes	√ No

2.8 What are the sources of water for your domestic use?	a) Public Water Supply	b) Bore Hole	c) Hand Pumps/Motor	d) √ Any Other **(Buy)**

2.9 Are you satisfied with the water quality?	Yes	√ No

If No, Specify	No Response

2.10 Facilities in this neighborhood?

Facilities	Yes	No	Name	Distance from Proposed Project
Education Institutions	√		Mono Technical Institute	10 minutes
Health Institutions		√		
Religious Place (Mosque / Shrine / Graveyard)	√		Jamia Masjid Qadria Malir	5 minutes
Recreational Place		√		
Historical / Archaeological Monument		√		

2.11 Do you know about the KNIP Interventions to improve this neighborhood?	√ Yes	No

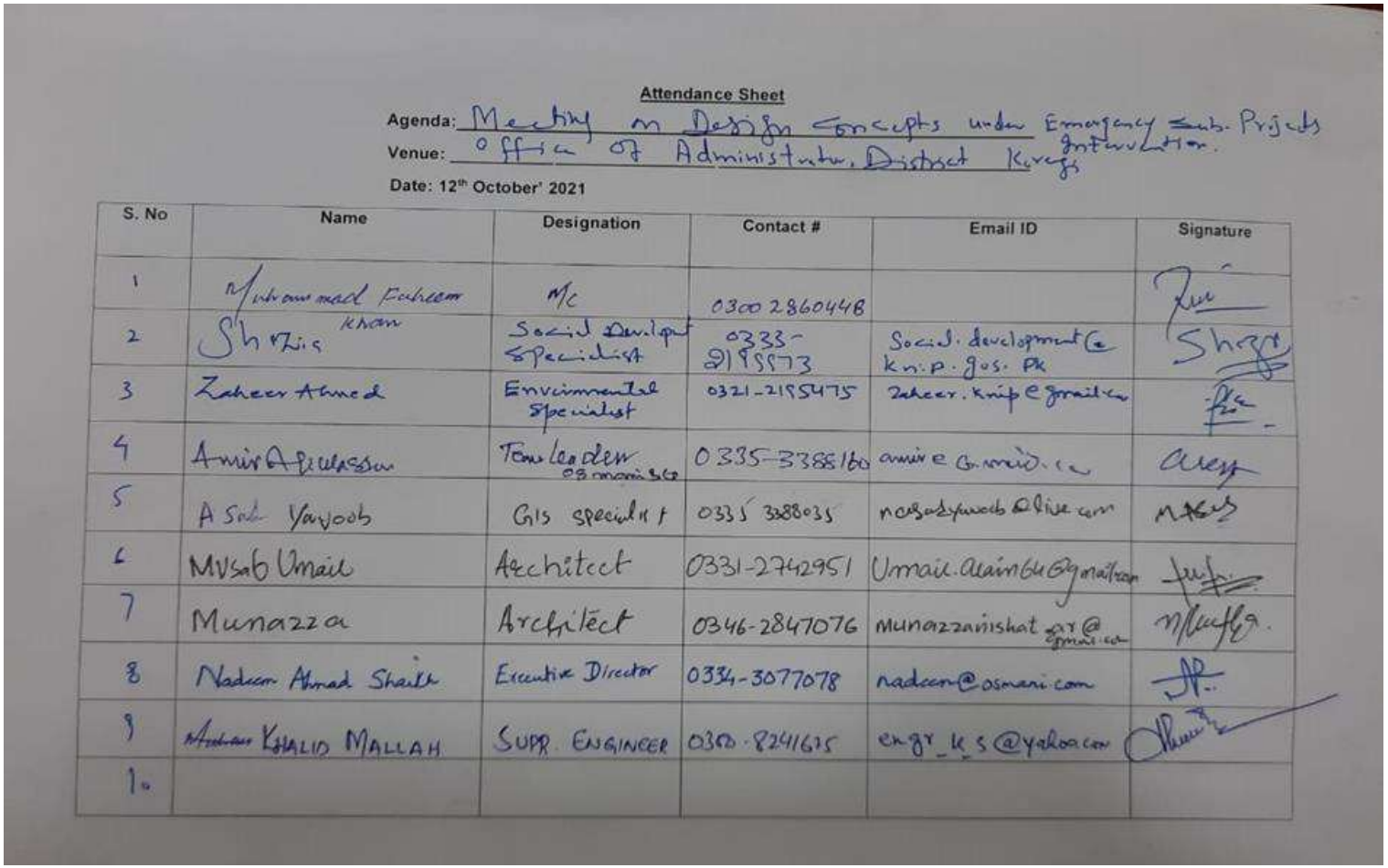
2.12 How often the flood situation faced by your neighborhood?	a) √ Every Year	b) 5 Years	c) > 5 years

2.13 Is the street in or around your property especially or unusually dangerous to travel on during rains?		Yes	√ No	
2.14 Is there some other drainage issue of which you would like the town to beware that may or may not be on your own property?		Yes	√ No	
2.15 Incidence of notable diseases in your area				
NO				
2.16 What is the Covid-19 situation in your area?	a) Very High	b) High	c) Medium	d) √ Low
2.17 Is the SOPs of Covid-19 are being followed by the public/shopkeepers?	a) Yes	b) √ No	c) Only, when strictly forced by the Government	
2.18 Are there industries in your area		Yes	√ No	
2.19 How safe do you feel in your neighborhood?	a) √ Always	b) Often	c) Usually	d) Never
2.20 Do you have adequate lightning in public places and streets?		Yes	√ No	
2.21 Are there footpaths and walking trails in your area?		Yes	√ No	
2.22 Are there pelican crossings available to cross the road?		Yes	√ No	
Pressing Needs and General Remarks of the Respondent:				
Water & Solid Waste issues				

Name & Signature of Interviewer: Mavish Mazhar **Dated: 18-110-21**

ANNEXURE V- ATTENDANCE SHEETS OF CONSULTATIONS

CONSULTATION MEETING WITH MUNICIPAL COMMISSIONER KORANGI DISTRICT, OCTOBER 12TH, 2021



Attendance Sheet

Agenda: Meeting on Design Concepts under Emergency Sub-Projects Intervention.

Venue: Office of Administrator, District Korangi

Date: 12th October' 2021

S. No	Name	Designation	Contact #	Email ID	Signature
1	Muhammad Faheem	MC	0300 2860448		
2	Shaziq Khan	Social Dev. Spec.	0333-2195573	Social.development@knp.gos.pk	
3	Zaheer Ahmed	Environmental Specialist	0321-2195475	zaheer.knp@gmail.com	
4	Amir Aftab Abbasi	Team Leader	0335-3388160	amir@gmail.com	
5	Asif Yaqoob	GIS Specialist	0335 3388035		
6	MUSAB Umair	Architect	0331-2742951	Umair.alain64@gmail.com	
7	Munazza	Architect	0346-2847076	Munazzanishat@gmail.com	
8	Nadeem Ahmad Shaikh	Executive Director	0334-3077078	nadeem@osmani.com	
9	Khalid Mallah	Supr. Engineer	0300-8241615	engr_k_s@yahoo.com	
10					

CONSULTATION MEETING WITH KW & SB KORANGI DISTRICT, OCTOBER 14TH, 2021

Attendance Sheet

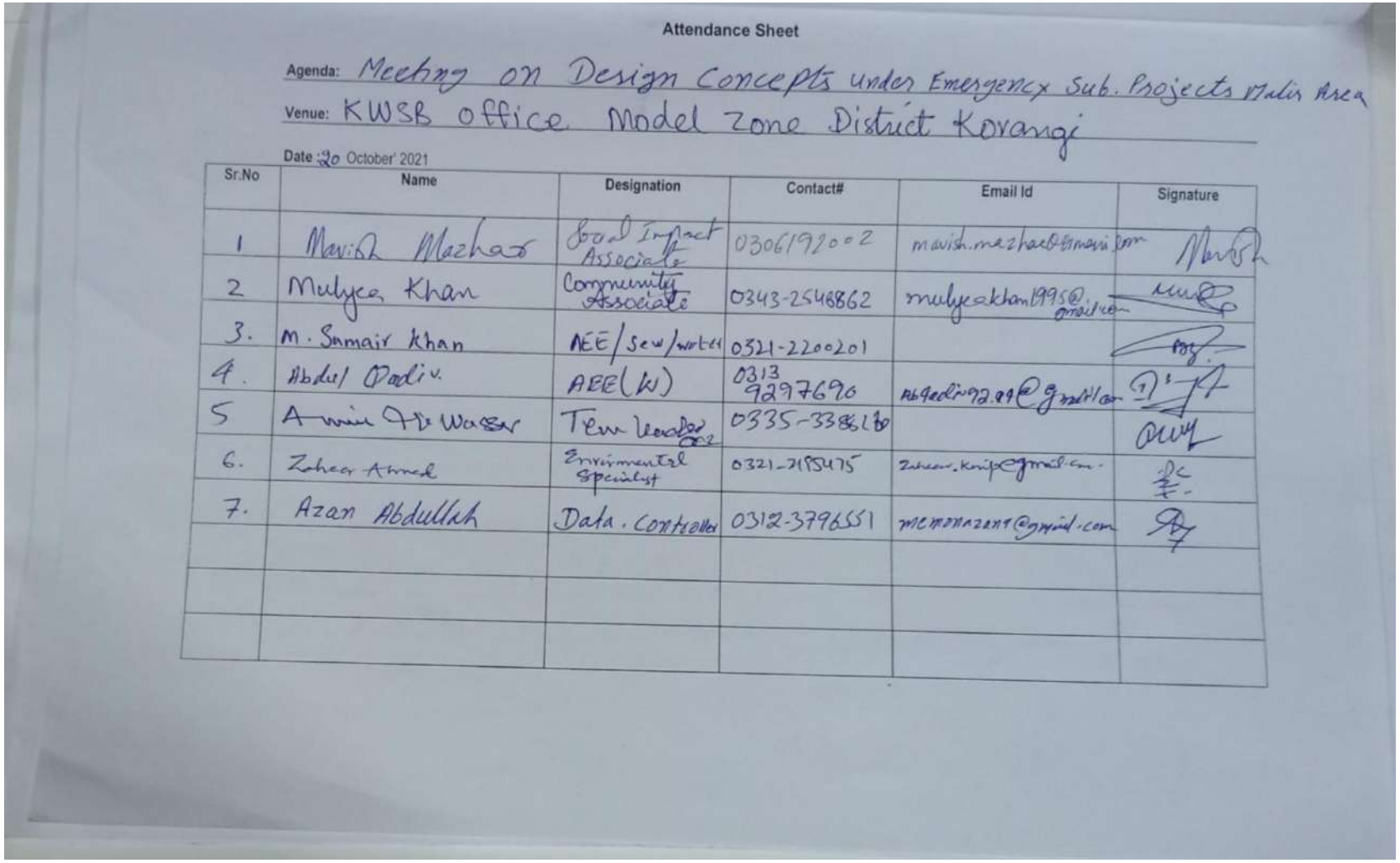
Agenda: K-IUIP Road/Park.

Venue: Executive Engineer office Korangi Division KWSB

Date: 14th October' 2021

S. No	Name	Designation	Contact #	Email ID	Signature
1	Mr. Khalid Farooqi S	Executive Engineer	0300-9272163	muhammad_faruqi@yahoo.com	
2	Amir Ali Wassan	Team Leader Osmani & Co.	03353388160	[illegible]	
3	Mulyca Khan	Community Coordinator	0343-2546862	mulycakhan1995@gmail.com	
4.	Mavish Mazhar	Social Impact Coordinator	03061692002	mavish.mazhar@hotmail.com	
5.	Azan Abdullah	Data Controller	0312-3796551	memonazan9@gmail.com	
6.	Zaheer Ahmed.	Environmental Specialist	0321-2195475	Zaheer.kmip@gmail.com	

STAKEHOLDER CONSULTATION MEETING WITH KW & SB MODEL ZONE OFFICE, OCTOBER 20TH, 2021



Attendance Sheet

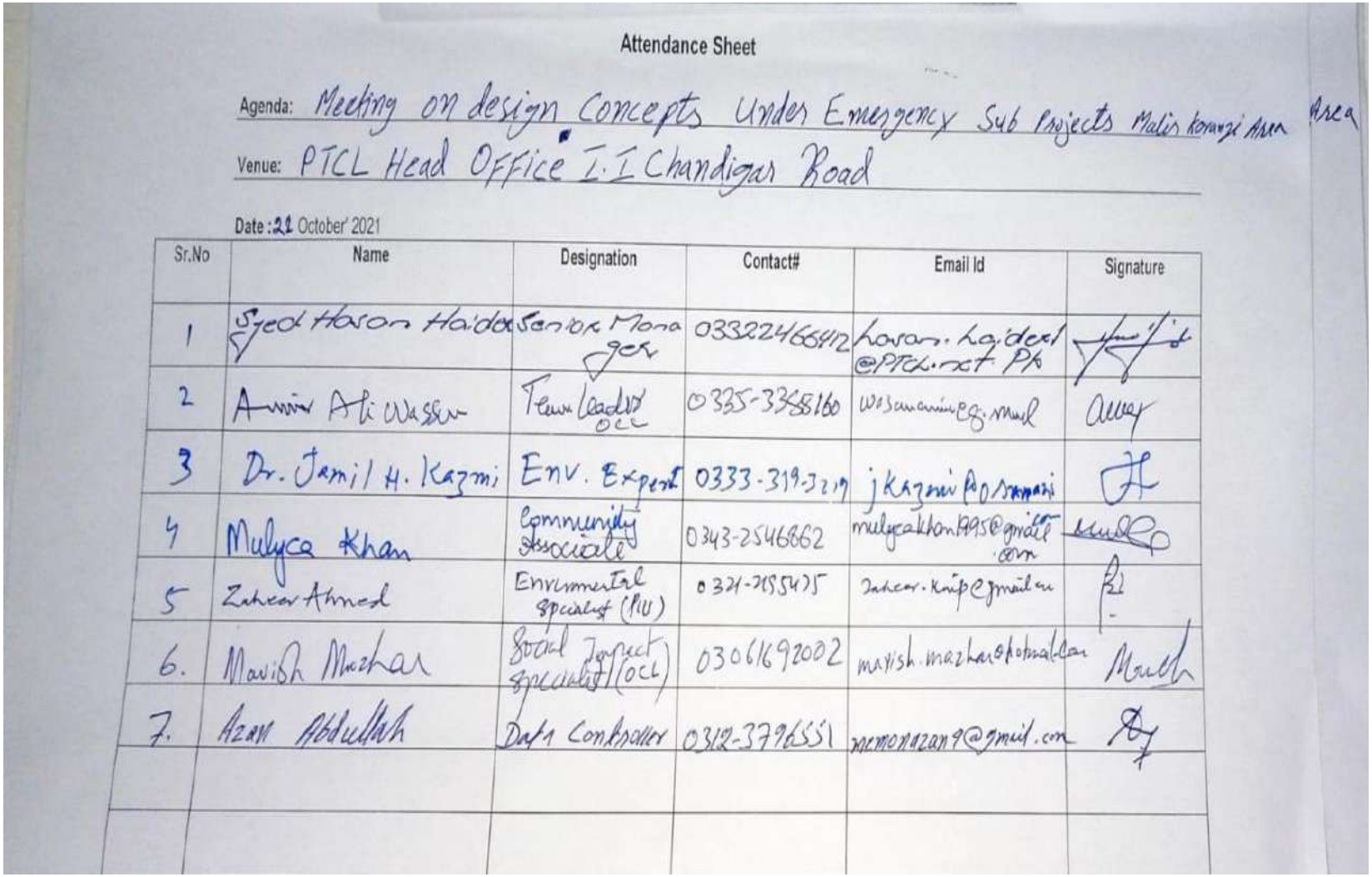
Agenda: Meeting on Design Concepts under Emergency Sub. Projects Malir Area

Venue: KWSB office Model Zone District Korangi

Date: 20 October' 2021

Sr.No	Name	Designation	Contact#	Email Id	Signature
1	Mavish Mazhar	Social Impact Associate	03061920002	mavish.mazhar@gmail.com	
2	Mulyca Khan	Community Associate	0343-2546862	mulycakhan1995@gmail.com	
3.	M. Samair Khan	AEE/Sew/water	0321-2200201		
4.	Abdul Qadir.	AEE(W)	0313 9297696		
5	Amin Ul Wasay	Team Leader	0335-3386160		
6.	Zaheer Ahmed	Environmental Specialist	0321-7185475	zaheer.knp@gmail.com	
7.	Azan Abdullah	Data. Controller	0312-3796551		

STAKEHOLDER CONSULTATION MEETING WITH PTCL HEAD OFFICE SOUTH DISTRICT, OCTOBER 21ST, 2021



Attendance Sheet

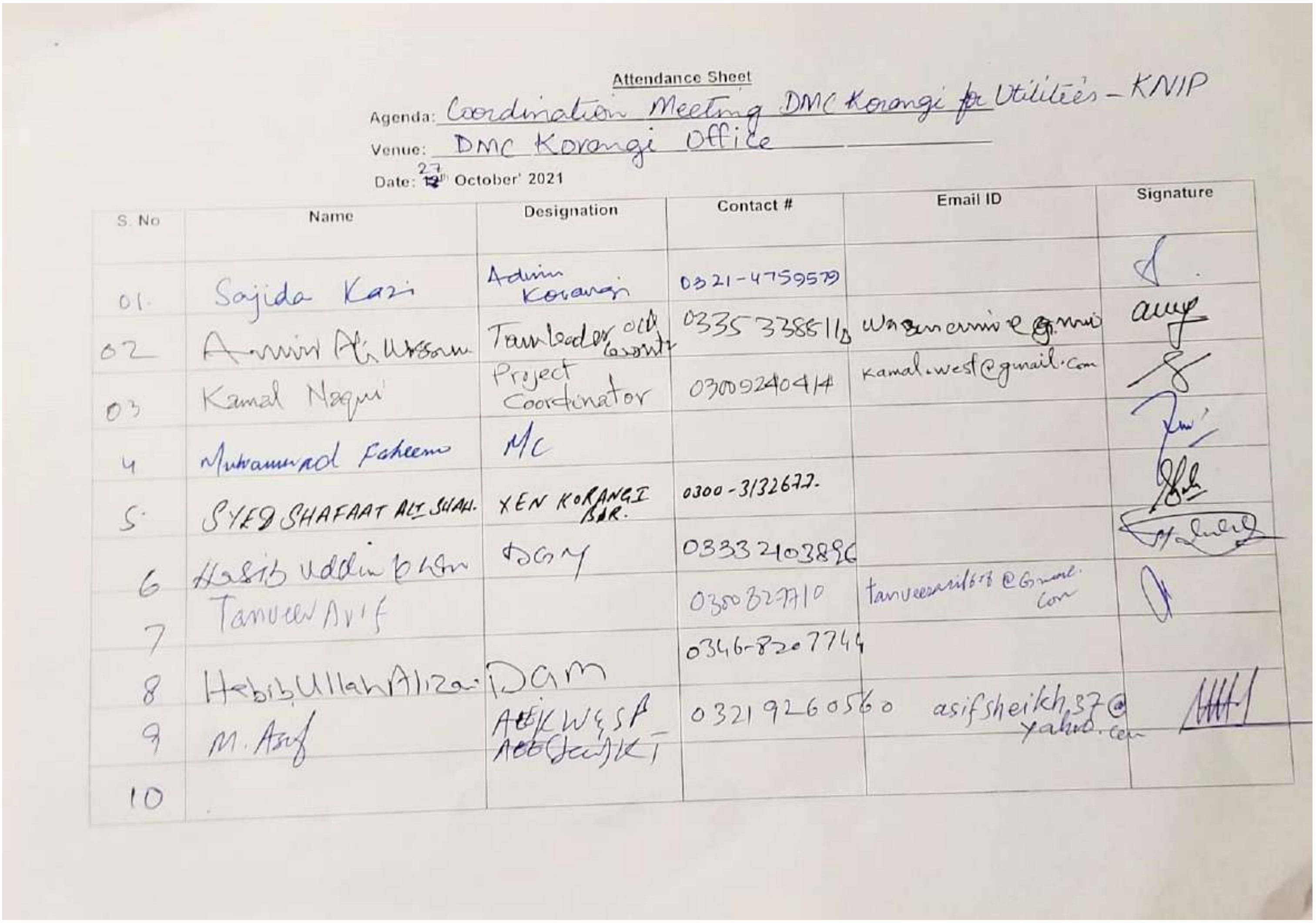
Agenda: Meeting on design Concepts Under Emergency Sub Projects Malir Korangi Area

Venue: PTCL Head Office I.I Chandigar Road

Date: 21 October 2021

Sr.No	Name	Designation	Contact#	Email Id	Signature
1	Syed Haroon Haider	Senior Manager	03322466412	haroon.haider@ptcl.net.pk	
2	Amir Ali Wassan	Team Leader OCL	0335-3458160	Wasanamir@gmail	
3	Dr. Jamil H. Kazmi	Env. Expert	0333-319-3219	jkazmi@	
4	Mulyca Khan	Community Associate	0343-2546862	mulycakhan995@gmail.com	
5	Zaheer Ahmed	Environmental Specialist (PIU)	0321-2155425	zaheer.knp@gmail.com	
6.	Mavish Mazhar	Social Impact Specialist (OCL)	03061692002	mavish.mazhar@hotmail.com	
7.	Azam Abdullah	Data Controller	0342-3796551	memonazam9@gmail.com	

STAKEHOLDER CONSULTATION MEETING WITH DMC KORANGI DISTRICT, OCTOBER 27TH, 2021



Attendance Sheet

Agenda: Coordination Meeting DMC Korangi for Utilities – KNIP

Venue: DMC Korangi Office

Date: 27th October' 2021

S. No	Name	Designation	Contact #	Email ID	Signature
01.	Sajida Kazi	Admin Korangi	0321-4759579		[signature]
02	Amir Ali Wasim	Team leader old consult	03353388116	Wasimamir@gmail	[signature]
03	Kamal Naqvi	Project Coordinator	03009240414	kamal.west@gmail.com	[signature]
4	Muhammad Faheem	MC			[signature]
5.	SYED SHAFAAT ALI SHAH.	XEN KORANGI B&R.	0300-3132677.		[signature]
6	Habib uddin khan	DGM	03332403896		[signature]
7	Tanveer Arif		03008327710	tanveerarif[illegible]@Gmail.com	[signature]
8	HabibUllahAlizai	DGM	0346-8207744		
9	M. Asif	AEE KW&SB AEE (Jail) KT	03219260560	asifsheikh37@yahoo.com	[signature]
10					

Attendance Sheet

Agenda: Coordination Meeting DMC Korangi for Utilities-KNIP

Venue: DMC Korangi Office.

Date : 27 October' 2021

Sr.No	Name	Designation	Contact#	Email Id	Signature
11	Shaukat Alvi	Sr. CTE	03215261666	alvishau@gmail.com	
12.	Zaheer Ahmed	Environmental Specialist	0321-2195475	zaheer.knip@gmail.	
13	Uzma Bano	Gender Specialist	0333 2334413	genderQ knip.gos.pk	Uzma Bano
14	Raza Meraj	ABM/PTCL	0335-3067395	raza.meraj@ptcl.net.pk	
15	Zeeshan Siddiqui	ABM/PTCL	0337-2606058	Zeeshan.Siddiqui@ptcl.net.pk	
16	Mavish Mazhar	Social Impact Specialist	03061692002	mavish.mazhar@hotmail.com	
17.	Mulyca Khan	Community Coordinator	0343-2546862	mulycakhan999@gmail.com	
18	DOSTAIN KHAN	ARCHITECT	0310-8897779	Dostainhassn.88@gmail.com	
19	Nadeem A. Shaikh	Executive Director Osmani & Co.(Pvt) Ltd.	0334-3077078	nadeem@osmani.com	

Attendance Sheet

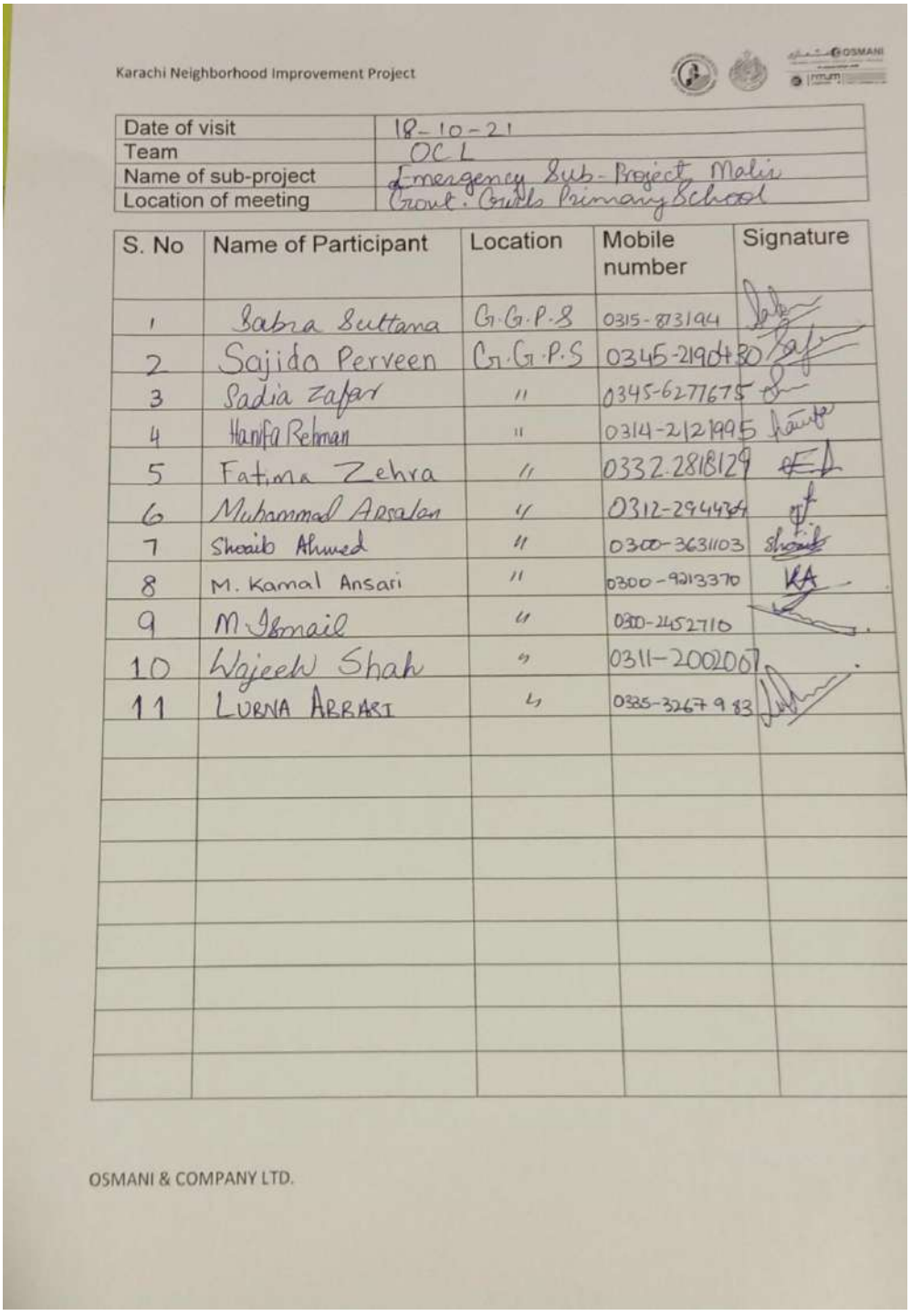
Agenda: Coordination Meeting DMC Korangi for Utilities - KNIP

Venue: DMC Korangi Office

Date: 21th October' 2021

S. No	Name	Designation	Contact #	Email ID	Signature
20	Nadeem A. Shaikh				
21	Samiullah	XEN	0300-3233735		
22	Gul Hassan	Manager (PM) (K Electric)	0346-8217822		
23	Azan Abdullah	Data Controller	0312-3796551		

PUBLIC CONSULTATION MEETING AT GOVT. GIRLS PRIMARY SCHOOL, OCTOBER 18TH, 2021



Karachi Neighborhood Improvement Project

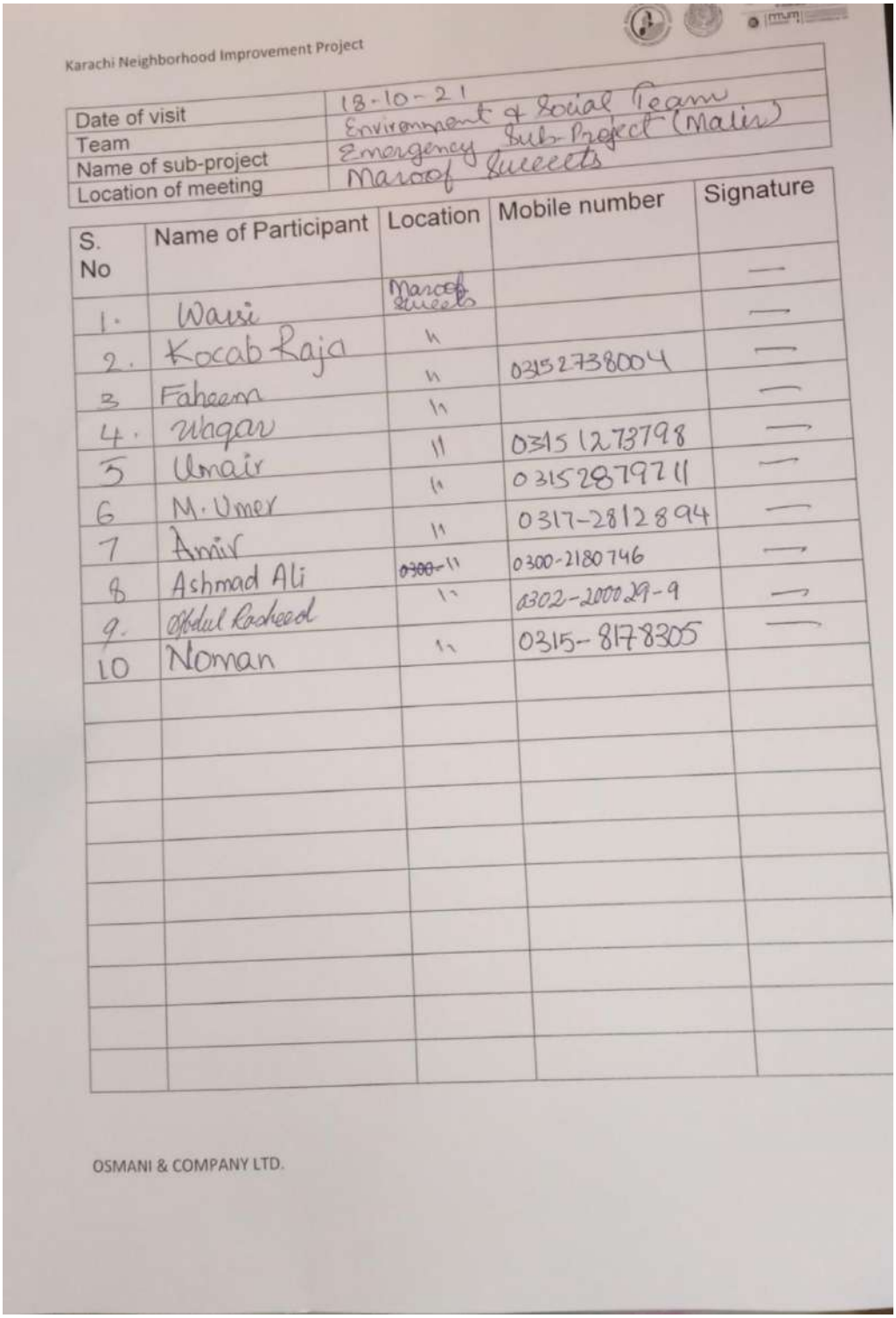
OSMANI

Date of visit	18-10-21
Team	OCL
Name of sub-project	Emergency Sub-Project Malir
Location of meeting	Govt. Girls Primary School

S. No	Name of Participant	Location	Mobile number	Signature
1	Sabra Sultana	G.G.P.S	0315-8731941	
2	Sajida Perveen	Gr.G.P.S	0345-2190480	
3	Sadia Zafar	"	0345-6277675	
4	Hanifa Rehman	"	0314-2121995	
5	Fatima Zehra	"	0332.2818129	
6	Muhammad Arsalan	"	0312-2944841	
7	Shoaib Ahmed	"	0300-3631103	
8	M. Kamal Ansari	"	0300-9213370	
9	M. Ismail	"	030-2452710	
10	Wajeeh Shah	"	0311-2002007	
11	LUBNA ABBASI	"	0335-3267983	

OSMANI & COMPANY LTD.

PUBLIC CONSULTATION MEETING AT MAROOF SWEETS, OCTOBER 18TH, 2021



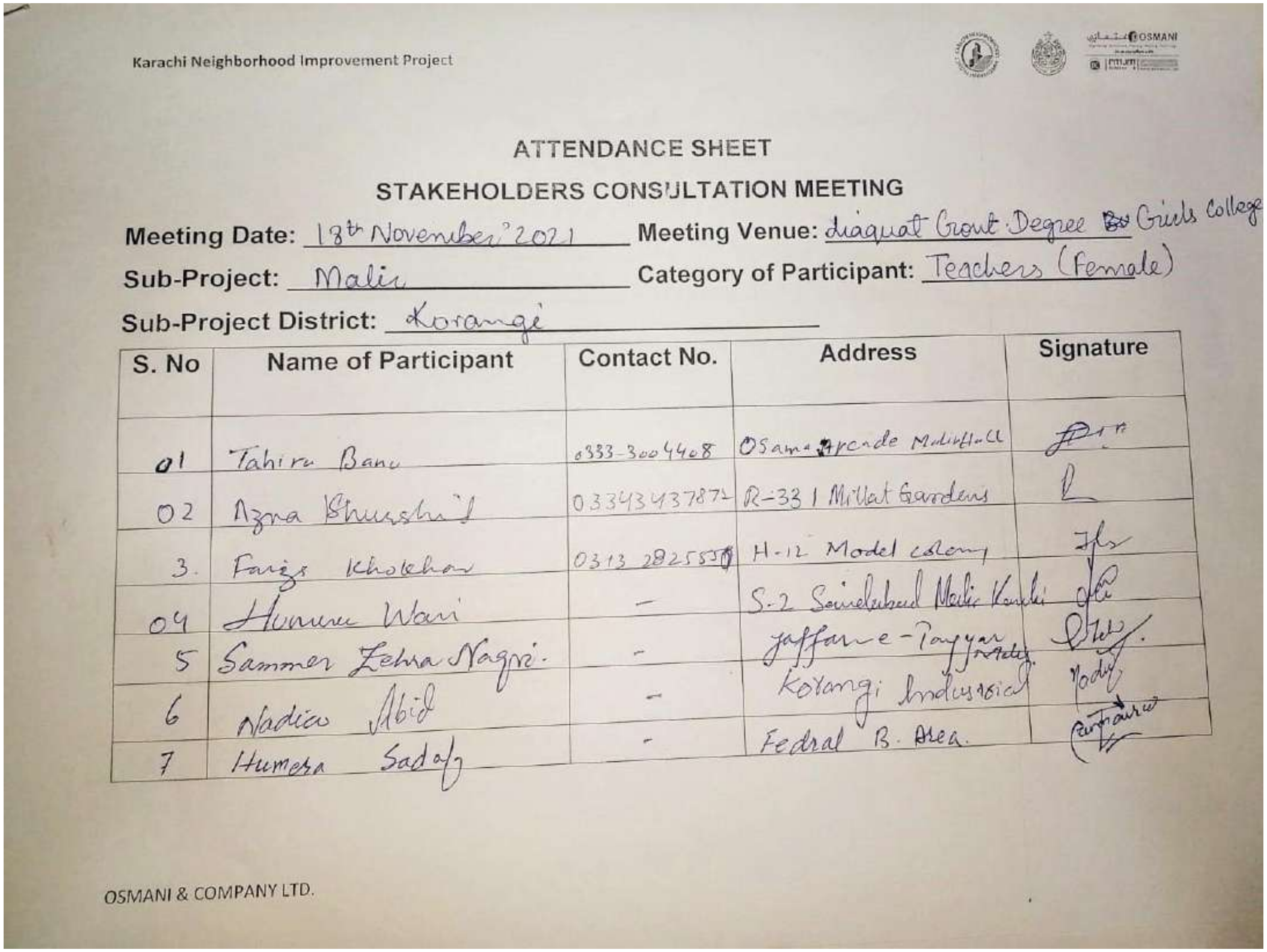
Karachi Neighborhood Improvement Project

Date of visit	18-10-21
Team	Environment & Social Team
Name of sub-project	Emergency Sub-Project (Malir)
Location of meeting	Maroof Sweets

S. No	Name of Participant	Location	Mobile number	Signature
1.	Wasi	Maroof Sweets		—
2.	Kocab Raja	"		—
3	Faheem	"	03152738004	—
4.	Uhqar	"		—
5	Umair	"	0315 1273798	—
6	M. Umer	"	03152879711	—
7	Amir	"	0317-2812894	—
8	Ashmad Ali	0300-"	0300-2180746	—
9.	Abdul Rasheed	"	0302-2000249-9	—
10	Noman	"	0315-8178305	—

OSMANI & COMPANY LTD.

PUBLIC CONSULTATION MEETING AT LIAQUAT GOVT. DEGREE GIRLS COLLEGE, NOVEMBER 18TH, 2021



Karachi Neighborhood Improvement Project

OSMANI

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 18th November 2021 **Meeting Venue:** Liaquat Govt. Degree Girls College

Sub-Project: Malir **Category of Participant:** Teachers (Female)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
01	Tahira Banu	0333-3004408	Osama Arcade Malir Halt	[signature]
02	Azra Khursheed	03343437872	R-331 Millat Gardens	[signature]
3.	Fariz Khokhar	0313 2825550	H-12 Model colony	[signature]
04	Humera Wani	-	S-2 Saudabad Malir Karachi	[signature]
5	Sammer Zehra Naqvi.	-	Jaffar-e-Tayyar	[signature]
6	Nadia Abid	-	Korangi Industrial	[signature]
7	Humera Sadaf	-	Fedral B. Area.	[signature]

OSMANI & COMPANY LTD.

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 18th November'2021 **Meeting Venue:** Liaquat Govt. Girls Degree College

Sub-Project: Malir **Category of Participant:** Teachers (Female)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
8.	Fauzia Abid	03343354385	Gulfishan Housing Society Malir Karachi	
9.	Sahar Anjum	03433495897	Rafa-e Aam Society Malir Karachi	
10.	Farah Batool	03350213879	B-26/640 Jaffar Tayyar Malir	
11.	Yasmeen Nadeem	0321.2557098	Askari D 56. 8-B Malir Cantt	
12.	Munira Humai	0345-2124080	2/1233 Sitch Faisal colony	
13	Zaheer Ahmed	0321-2195175	PIU-KNIP	
14	Uzma Bano	0333 2334413	PIU-KNIP	Uzma Bano

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 18th November' 2021 **Meeting Venue:** Liaquat Grant Degree Girls College

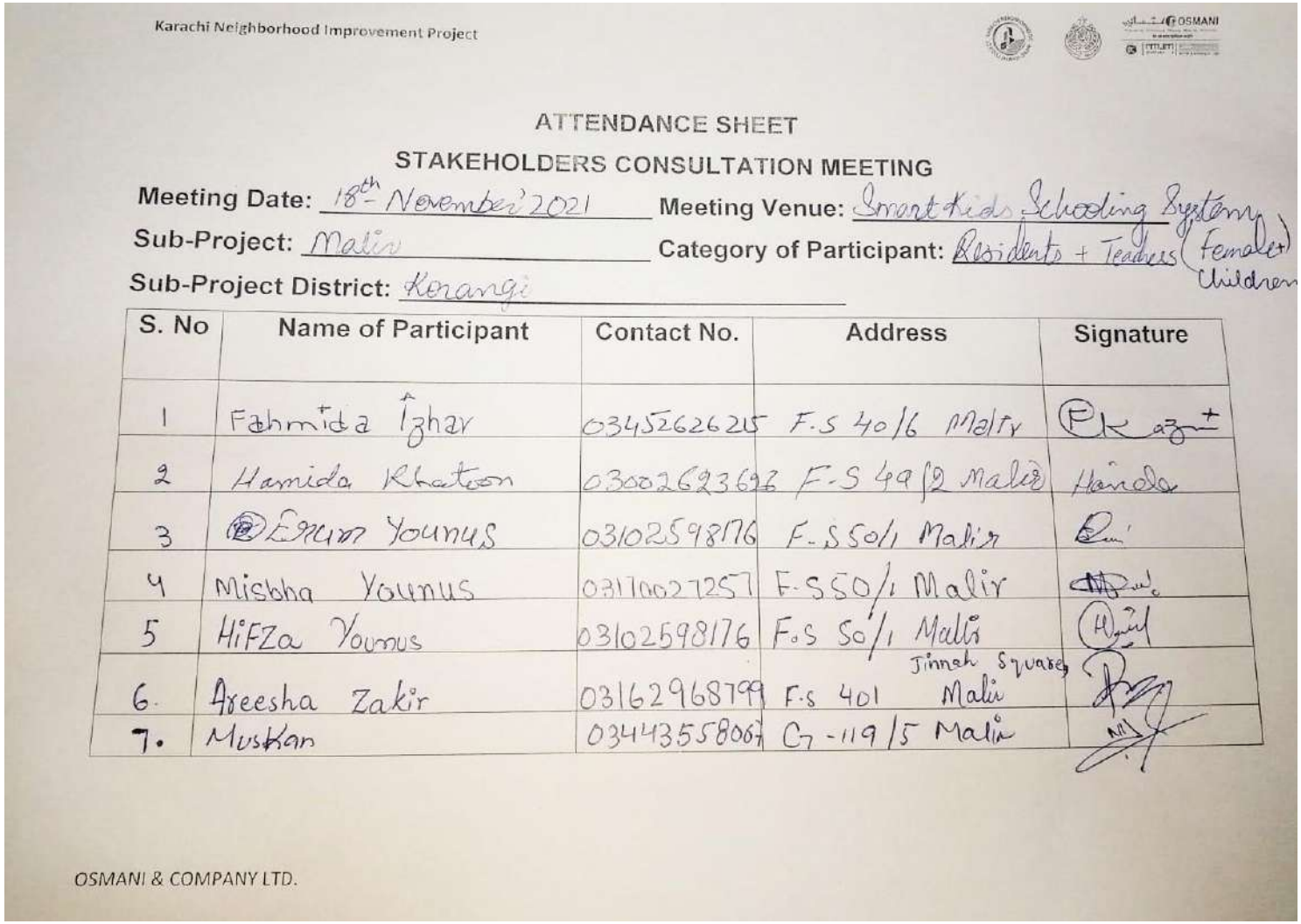
Sub-Project: Malir **Category of Participant:** Teachers (Female)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
15	Shiraz	0333-2188973	PIU- KNIP	
16	Maryam Khan	0307-2839085	OCL	
17	Jamil H. Kazmi	0333-319-3219	OCL	
18	Farheen Adil	03328289504	Model Colony	
19	Mulyca Khan	0343-2546862	OCL	
20	Manish Mazhar	03061692002	OCL	
21	Munazza Nishat	0346-2847076	Architect OCL	
22	Azan Abdullah	0312-3796551	OCL	

OSMANI & COMPANY LTD.

PUBLIC CONSULTATION MEETING AT SMART KIDS SCHOOLING SYSTEM, NOVEMBER 18TH, 2021



Karachi Neighborhood Improvement Project

OSMANI

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 18th November 2021 Meeting Venue: Smart Kids Schooling System

Sub-Project: Malir Category of Participant: Residents + Teachers (Female) Children

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
1	Fahmida Izhar	03452626215	F.S 40/6 Malir	
2	Hamida Khatoon	03002623696	F-S 49/2 Malir	
3	Erum Younus	03102598176	F-S 50/1 Malir	
4	Misbha Younus	03170027257	F-S 50/1 Malir	
5	HiFZa Younus	03102598176	F.S 50/1 Malir	
6.	Areesha Zakir	03162968799	F.S 401 Jinnah Square Malir	
7.	Mushkan	03443558067	C7 -119/5 Malir	

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ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 18th November 2021 **Meeting Venue:** Smart Kids Schooling System

Sub-Project: Malir **Category of Participant:** Residents + Teachers (Female + Children)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
15	Naseem fatima	0345-2853879	F/S/69/3 Malir Karachi	
16	Muntaha Nadeem	03102145262	C23/A Aleemabad malir	
17	Ghazal Khan	03162965554	G 55/4 Jinnah Square	
18	Wida Khalid	03162372469	C-51 Jinnah Square	
19	Nija Yaseen	0310-2345377	F.S 95 jinnah Square	
20	Muniba Yaseen	0310-2345377	F.S 95 Jinnah square	
21	Alishba Shahzad	0315-1293137	G-80/3	

OSMANI

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 18th November 2021 **Meeting Venue:** Smart Kids Shooting System

Sub-Project: Malir **Category of Participant:** Residents / Teachers (Female & Children)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
22	Uzma Bano	0333 2334413	KNIP	Uzma
23	Zaheer Ahmed	0321 7195475	KNIP	
24	Shazia	0333 2199173	KNIP	Shazia
25	Jamil M. Kazmi	0333-319-3219	OCL	
26	Tanveer Arif	0300-3277101	OCL	
27	Mallyca Khan	03432546362	OCL	
28.	Mavish Mazhar	03061692002	OCL	
29.	Azan Abdullah	0312-3796551	=	

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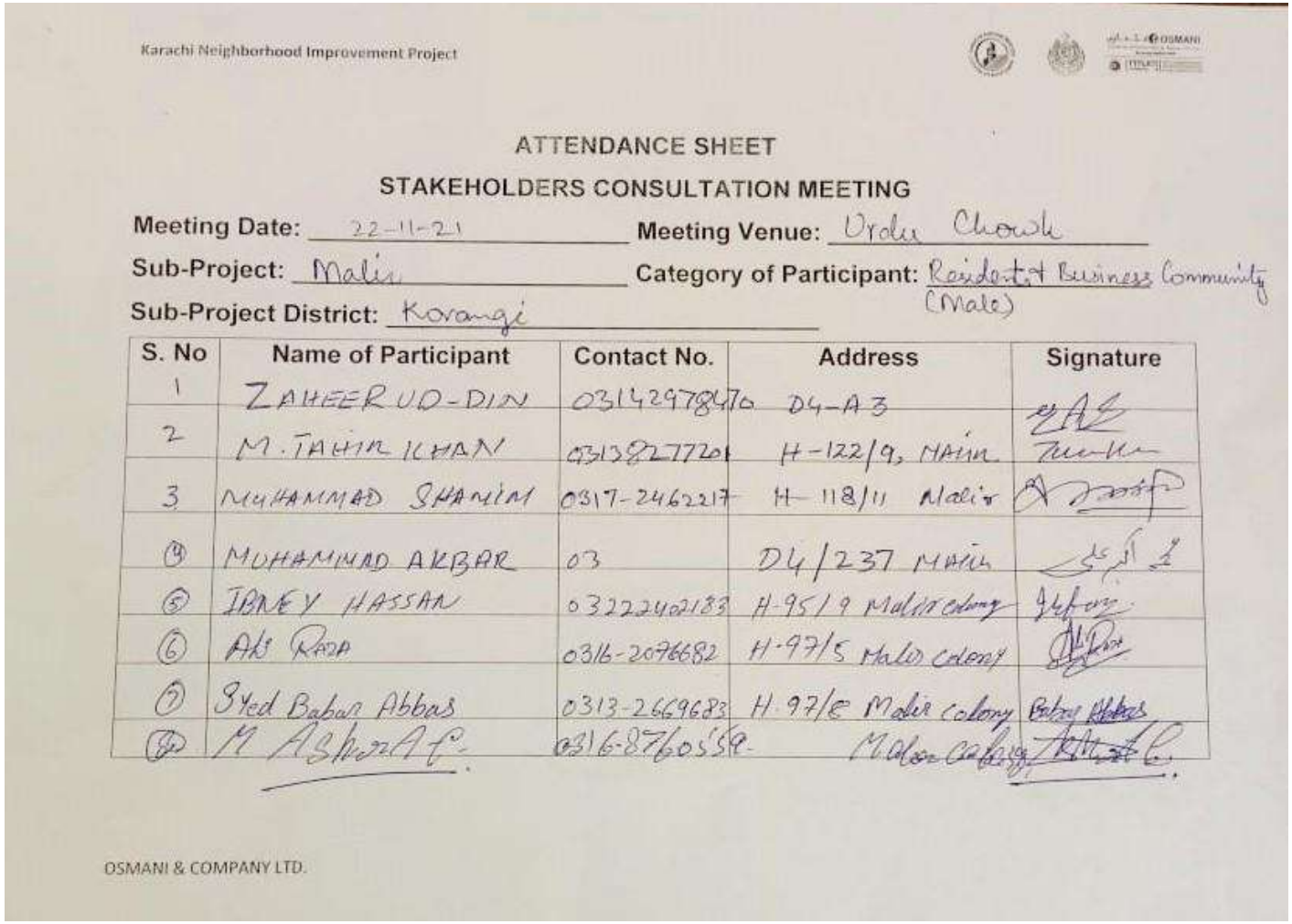
PUBLIC CONSULTATION MEETING AT URDU CHOWK, NOVEMBER 22ND, 2021



Karachi Neighborhood Improvement Project

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22-11-21 Meeting Venue: Urdu Chowk

Sub-Project: Malir Category of Participant: Resident, Business Community (Male)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
1	ZAHEER UD-DIN	03142978470	D4-A3	
2	M. TAHIR KHAN	03138277201	H-122/9, Main	
3	MUHAMMAD SHAMIM	0317-2462217	H-118/11 Malir	
4	MUHAMMAD AKBAR	03	D4/237 Main	
5	IBNEY HASSAN	03222402183	H-95/9 Malir colony	
6	Ali Raza	0316-2076682	H-97/5 Malir colony	
7	Syed Babar Abbas	0313-2669683	H-97/E Malir colony	
8	M Ashraf	0316-8760559	Malir Colony	

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ATTENDANCE SHEET

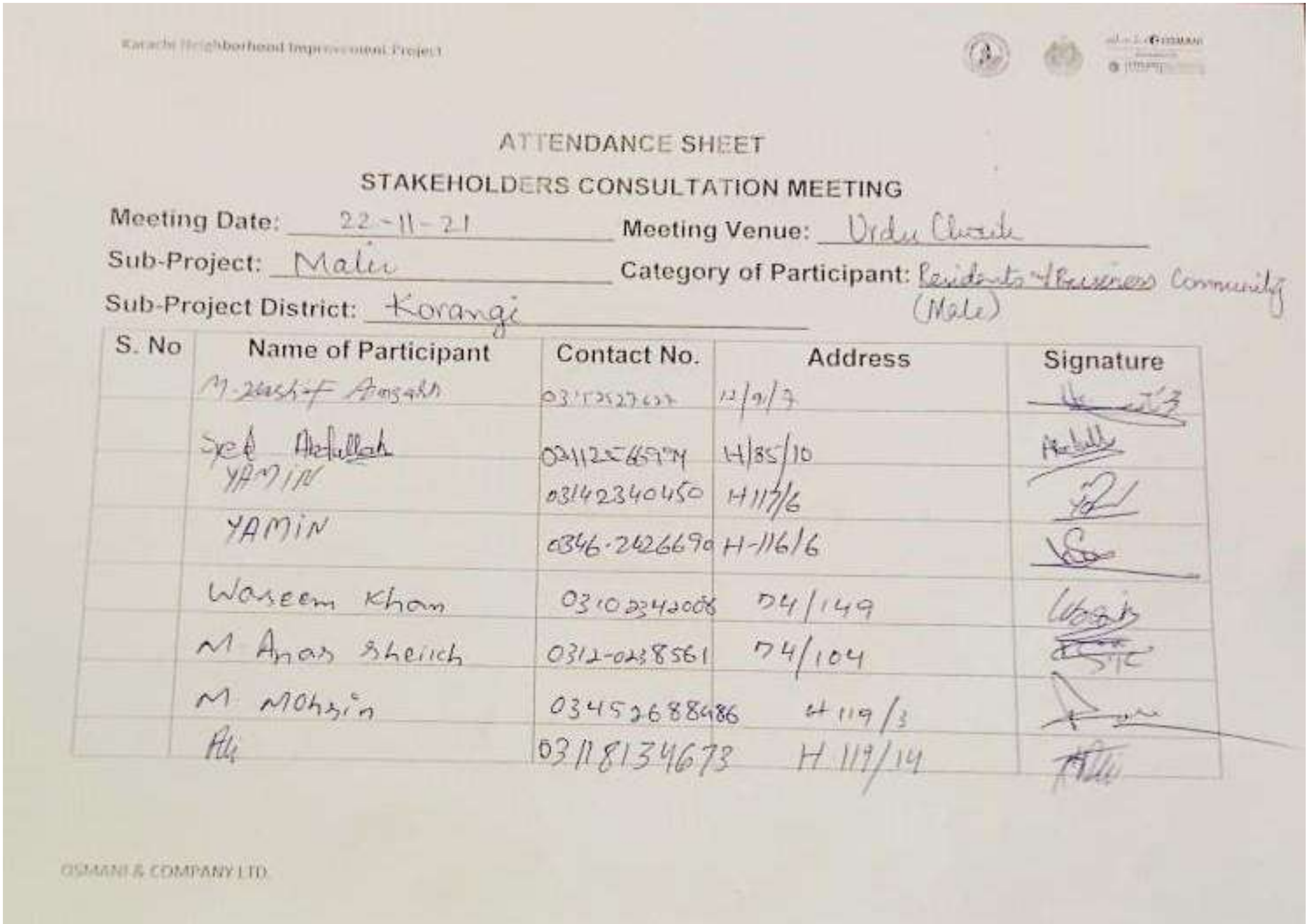
STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22-11-21 **Meeting Venue:** Urdu Chowk

Sub-Project: Malir **Category of Participant:** Residents of Business Community (Male)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
	M. HASSAN	0314-2840412	H/18/2	HASSAN
	Hamza Ali	0312-2093845	H/119/1	[illegible]
	M Fathan Khan	03132367225	D4/48	[illegible]
	Abdul Waheed	0317-0115682	Urdu Nagar	
	Shamshair	0311-9226955	Urdu Nagar	
	Shiza	0333-9199973	KMIP	Shiza
	Zaheer Ahmed		KNIP	[illegible]



Karachi Neighborhood Improvement Project

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22-11-21 Meeting Venue: Urdu Chowk

Sub-Project: Malir Category of Participant: Residents / Business Community (Male)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
	M. Zeeshan Amjad	03152527637	12/9/7	
	Syed Abdullah	03112566974	H/85/10	
	YAMIN	03142340450	H117/6	
	YAMIN	0346-2426690	H-116/6	
	Waseem Khan	03102342008	74/149	
	M Anas Sheikh	0312-0238561	74/104	
	M Mohsin	03452688486	H 119/3	
	Ali	03118134673	H 119/14	

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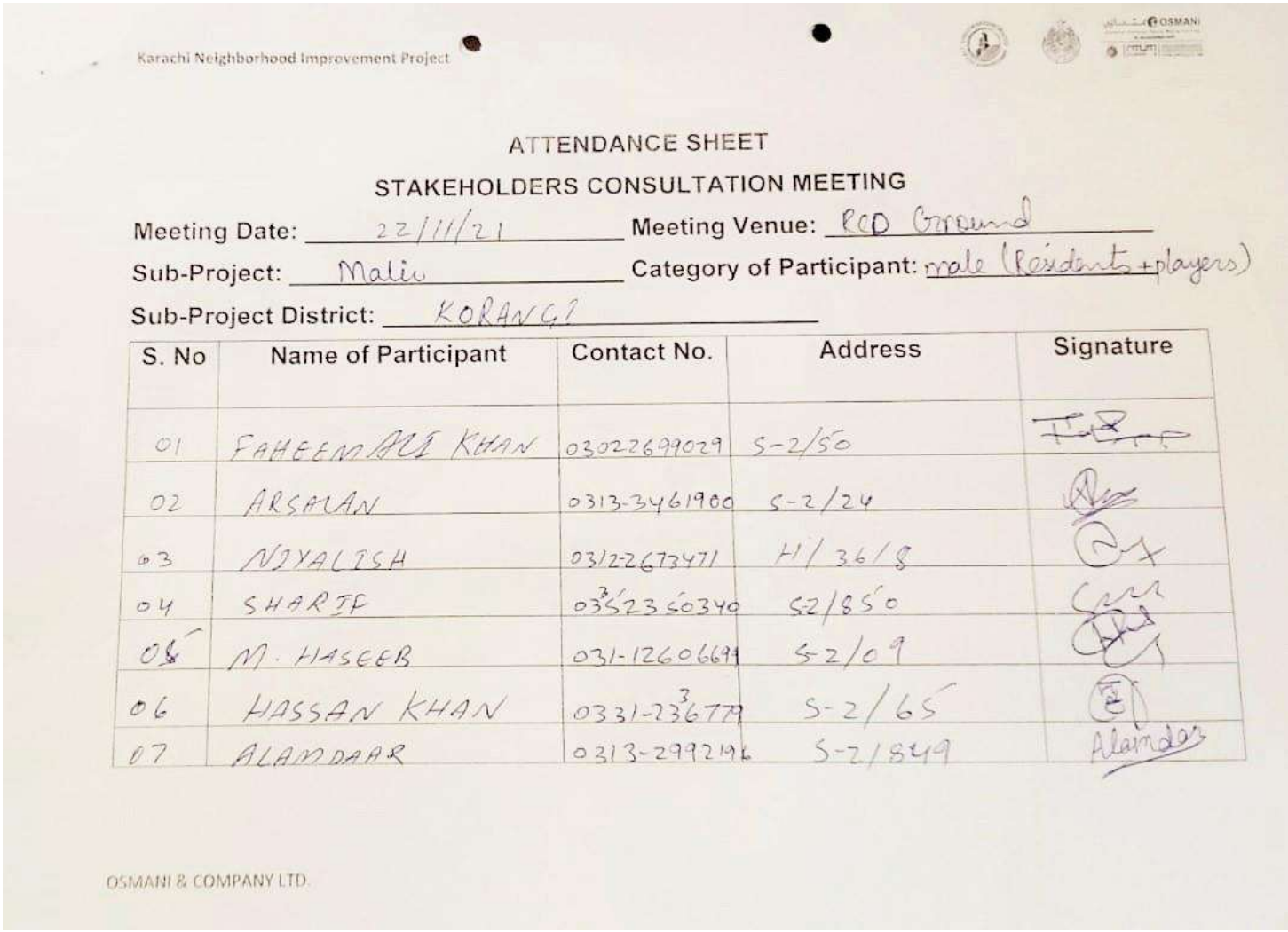
PUBLIC CONSULTATION MEETING AT RCD FOOTBALL GROUND, NOVEMBER 22ND, 2021



Karachi Neighborhood Improvement Project

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22/11/21 Meeting Venue: RCD Ground

Sub-Project: Malir Category of Participant: male (Residents + players)

Sub-Project District: KORANGI

S. No	Name of Participant	Contact No.	Address	Signature
01	FAHEEM ALI KHAN	03022699029	S-2/50	
02	ARSALAN	0313-3461900	S-2/24	
03	NIYALISH	031-2673471	H/36/8	
04	SHARIF	0335-2360340	S2/850	
05	M. HASEEB	031-1260669	S-2/09	
06	HASSAN KHAN	0331-2336779	S-2/65	
07	ALAMDAAR	0313-2992196	S-2/849	

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ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22/11/21 Meeting Venue: RCD Ground

Sub-Project: Malir Category of Participant: male (Residents + players)

Sub-Project District: KORANGI

S. No	Name of Participant	Contact No.	Address	Signature
8	Salman Khan	0300-2467454	S.2/155 Saadabad malir	
9	Mehfez Khan	0314-8086292	D-4 67 Saadabad malir	
10	ARSALAN	0311-8164867	C-42/6	
11	SAAD KHAN	0313-2020660	S-1	
12	M. OWAIS SIDDIQUI	0333-3657698	S-2	
13	MIRZA MUNEEB	031/220899	S-1	
14	SHUKAT	03491216366	S-2	

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OSMANI

ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22/11/21 Meeting Venue: RCD Ground

Sub-Project: Malir Category of Participant: male (residents + players)

Sub-Project District: KORANGI

S. No	Name of Participant	Contact No.	Address	Signature
15	M. AMER ASIF	0314-2184684	S-2/46	
16	HOSSAIN ALI	0345-2424506	S2/64	
17	FAISAL	0333-3208629	S-2/01	
18	ANUS	0316-2271165	S2/17	
19	HUSSAIN MEHDI	0335-2532809	S2/3	Hussain
20	FAIZE	03008919151	H151/7	
21	SHAMEEZ	03149368688	S-2/14	

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ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22-11-21 Meeting Venue: RCD Ground

Sub-Project: Malir Category of Participant: male (Residents+players)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
22	Parvez	0346-2926374		
23	S. Shahid Zafar	0312-2453776	H-136/9	
24	Wahab Ahmed	0346-2685516	S-2/7	
25	Nayyar Iqbal Ahmed	03335399785	S-2/4	
26	Muhammad Aslam	03132843071	S-1/786	
27	Aniq Khan	0347-2812894	S-2/5	
28	M. Ali Asif	0322-2022908	S-2/45	
29	Syed Kashif Ali	0312-2277965	S-2/28	

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ATTENDANCE SHEET

STAKEHOLDERS CONSULTATION MEETING

Meeting Date: 22-11-21 Meeting Venue: RCD Ground

Sub-Project: Malir Category of Participant: male (Residents + players)

Sub-Project District: Korangi

S. No	Name of Participant	Contact No.	Address	Signature
30	Zaheer Ahmed	0321-7195475	KNIP	
31	Shazia	0333-2199998	KNIP	
32	Faheem	0315-2738004	Malir	
33	Mulyca Khan	0343-2546862	OCL	
34	Mavish Mazhar	03061692002	OCL	
35	Azan Abdullah	0312-3796551	OCL	
36	Munazza Nishat	0346-2847076	Architect OCL	Munazza
37	Tanveer Arif	0300-8277101	OCL	

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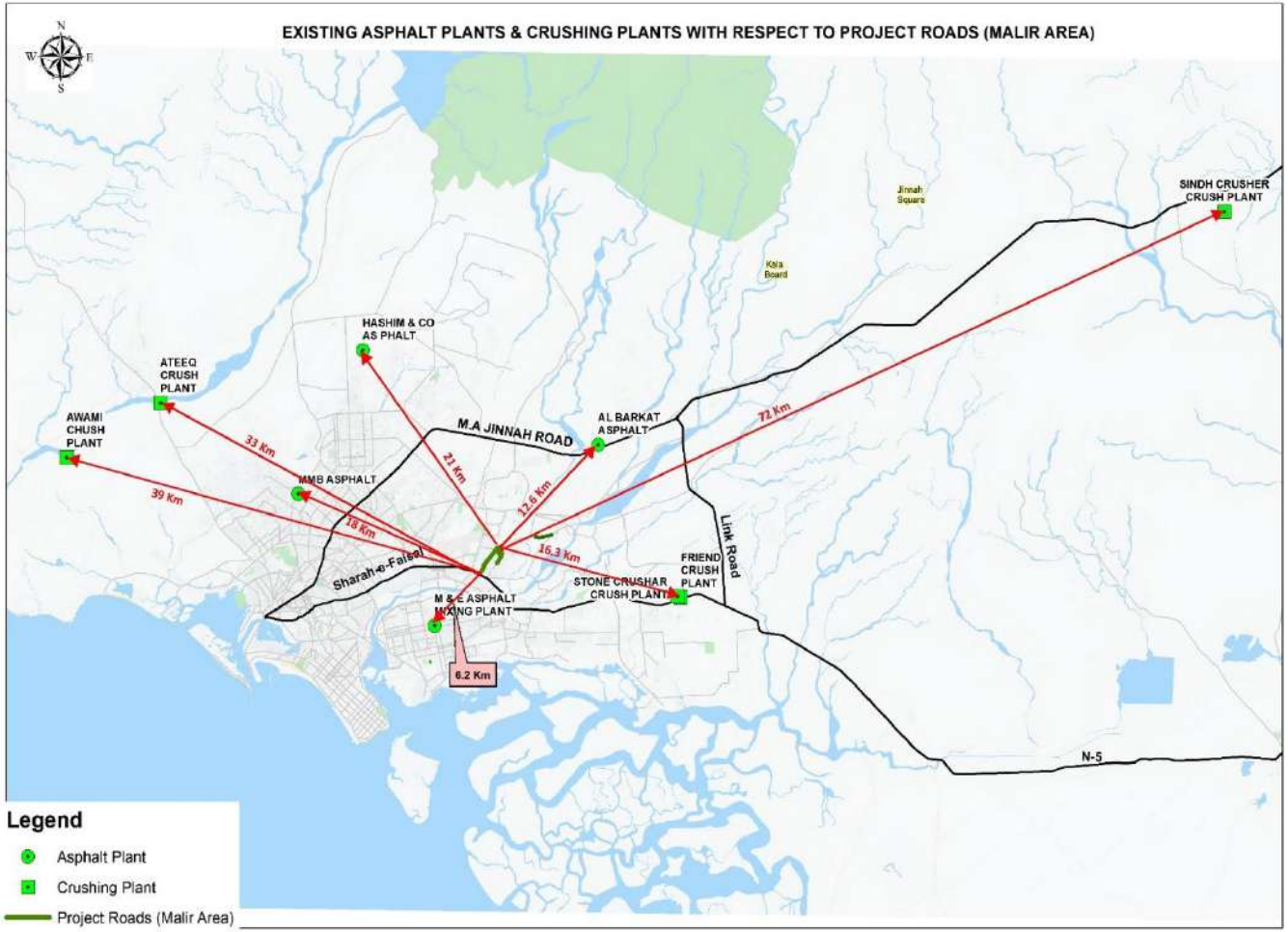
ANNEXURE VI- EXISTING ASPHALT AND CRUSHING PLANTS



ANNEXURE VII - ENVIRONMENT, HEALTH, AND SAFETY GUIDELINES

A. The general Environment, health and safety requirements are as follows:

a. Occupational diseases, work accidents and near misses occurred at workplaces shall be recorded and reported to relevant authorities.
b. Appropriate work equipment shall be provided for employees to conduct their work.
c. Health surveillance of employees shall be done in certain periods according to the nature of the work.
d. Floors where appropriate shall be made of flat even and non-slip material.
e. Vehicle and pedestrian paths shall be clearly separated and demarcated inside and outside of the buildings.
f. Proper conditions shall be provided to vulnerable employees (i.e. disabled, young employees, pregnant etc.) in workplaces.
g. Appropriate signs to remind and inform employees on hazards and steps to take shall be made available at workplaces.
h. Necessary training shall be provided on the use of work equipment and personal protection equipment.
i. A professional staff shall be designated to be responsible for health and safety at the work place as well as their names should be displayed in accessible places.
j. All information related to work hazards and preventive measures as well as emergency rules and exit plans in case of a serious incident shall be displayed in accessible places.
k. First aid facilities such as first aid boxes and first aid rooms, where appropriate, shall be provided. All workplaces shall have trained enough first aiders, according to the number of employees in the workplace, and ensure that medical teams are available at the work place whenever needed.
l. Information, dialogue and balanced participation on safety and health at work must be developed between employers and workers and or their representatives by means of appropriate procedures and instruments, in accordance with national laws and/ or practices.
m. Undertake periodic inspection of work equipment by qualified professionals and/or companies.

B. Occupational Safety and Health requirements for employers:

a. The employer shall have liability to ensure the safety and health of employees in every aspect related to the work. In this frame; the employer has the responsibility for hazard identification, prevent occupational risks, provide necessary organization, tools and adjustment of health and safety measures according to changing circumstances and aim to improve existing situations.
b. The employer must provide a platform for workers and employers to sit together and discuss all issue on OHS at workplace.
c. Outcomes of the health surveillance shall not be used to the detriment or against the employee's employment status.
d. Collective preventive measures shall be taken by employers, as a matter of priority over individual preventive measures.

e. Workers shall be granted the right to leave the work place in the event of extreme danger or anything that may threaten his life or health.

C. Occupational Safety and Health requirements for employees:

a. The employees' suitability regarding the work shall be taken into consideration.
b. The employees shall be provided with Personal Protective Equipment (PPE) appropriate to the nature of the work.
c. The employees shall be required to act complying with training and instructions given by employer.
d. Compensatory mechanisms shall be in place at the national level for employees injured or suffering from occupational diseases.

D. Risk Assessment

Risk assessment is a process performed in order to identify the hazards which may exist in a workplace, to analyze and grade the factors which cause the hazards turn into risks and to determine the precautions to reduce the risk that shall be taken. Risk assessment is done by the employers or he shall provide it to be done by an expert. Risk assessment shall be done with cooperation of employees and other experts and shall be revised and updated on a regular basis. The risk assessment shall be both qualitative and quantitative. The hierarchy that followed under the scope of risk assessment is:

a. The risks at workplace shall be abstained first and they shall be eliminated at its source.
b. If elimination is not possible, substitution of dangerous one with less dangerous one shall be done.
c. If substitution is not possible, engineering and administrative control measures shall be applied.
d. Appropriate PPE shall be used, as last resort, in order to minimize adverse effects of the risks.

E. Physical Factors

Risk hierarchy shall primarily be applied in workplaces. Besides, the employer shall take the precautions as follows:

a. Machines or work benches shall be maintained at regular intervals.
b. Employees exposed to physical risks at workplaces shall be trained and information resulting from these risks should be communicated.

The training shall include in particular:

c. The nature of such risks,
d. The measures taken to eliminate or reduce to a minimum the risks, including the circumstances in which the measures apply,
e. The exposure limit values of national legislation,
f. The correct use of PPEs,
g. Why and how to detect and report symptoms of health effects of physical risk factors exposure,
h. The circumstances in which employees are entitled to health surveillance and the purpose of health surveillance.

Besides the general liabilities given above, the employer shall take further precautions to eliminate or minimize physical risk factors which can be examined under seven headings as follows:

a. Noise

Minimum requirements for the employees to be protected from safety and health risks especially from those related to noise exposure are given as follows:

a) In order to prevent the sound from propagating in the air sound-absorbing materials shall be used to the extent of facilities in the workplace.
b) Where applicable, the distance between the noise source and the person exposed shall be increased.
c) Noisy machinery shall be enclosed as far as practically reasonable.
d) Proper maintenance of machines and equipment shall be done on a regular basis.
e) Hearing protection device shall be used in order to minimize adverse effects of the noise.

b. Vibration

The employer fulfils the minimum requirements for the employees to get protected from safety and health risks that may be caused by exposure to mechanical vibration. In this context proper working schedule, using less vibration equipment and adequate rest shall be planned and applied.

c. Thermal Comfort

The employer is to provide workplace with a good thermal comfort conditions. In this context:

a) Thermal comfort conditions in the workplace shall be in a way that would not disturb employees tasks performed and would not affect their physical and psychological situation.
b) Devices used for heating and cooling shall be placed in a way that would not disturb the employees and would not create risk of accidents. They shall be maintained and checked regularly.
c) Regarding the nature of the work, in case of working continuously in extremely hot or cold environments and windows and roof lights, so as to avoid the negative effects of sunlight that should be provided.
d) Adequate exchange of air appropriate to the task and environmental conditions shall be provided.

d. Illumination

The employer shall provide a sufficient illumination for employees to perform the job safely. In this context, workplaces shall be illuminated sufficiently by day light. In cases which beneficiation from day light is not possible or during night work, artificial light shall be provided for adequate lighting.

e. Dust

The employer shall provide a dust-free environment, to extent which is practicably applicable, for the employees to get protected from safety and health risks. In this context:

a) Water shall be used at places where dust is released. (Aqueous working-wet method).
b) Proper ventilation and control equipment shall be provided.
c) Appropriate PPE shall be provided and employer shall ensure proper use of PPE.
d) The exposure of employees' shall be monitored and documented regularly.

e) Chambers of high air pressure shall be placed in between dust releasing and dust free parts; passage of dust particles to dust free part shall be avoided.
f) Pre-employment and periodical medical examination of employees shall be done.

f. Ventilation

Pertaining to gases, dust and odor existing in the work environment, adequate ventilation shall be provided. The ambient air shall be changed according to nature of the work periodically. For the environments where works emitting dust, mist and fume are carried out, chimneys and air vents of capability to extract those shall be provided and in cases where these precautions are not sufficient, other technical precautions, according to the nature of the work done, shall be taken. At the workplaces where suffocating, toxic or irritating gas and smoke arising, ventilation installation shall be designed to protect the health of employees and masks and other protective equipment, according to the nature of the work done, shall be provided.

g. Fire and Explosions

In order to avoid, control and properly manage fire and explosions resulting from ignition of flammable substances such as chemicals or gases:

a. Flammables substance or material shall be stored away from ignition sources, inlets, exits and ventilation systems.
b. Workplace environment shall be equipped with sufficient number of appropriate fire extinguishing devices
c. Warning signs shall be placed at zones of fire risk
d. Employees shall be trained on working with flammable substances and fire response.

h. Asbestos Containing Materials (ACM)

The use of asbestos containing materials shall be avoided in construction of new buildings or in restoration or renovation activities as a new material in accordance with the highest standards. In order to be protected from health effects of asbestos exposure during removal, destruction, repair and maintenance, all necessary and crucial precautions shall be taken.

F. Biological Factors

Biological factors are microorganisms and cell culture which may cause any infection, allergy or poisoning, including ones that are genetically modified. In order to avoid and reduce the risks caused by biological factors, use of harmful biological agents shall be abstained and these harmful agents shall be substituted by less dangerous agents. Where this substitution is not possible, required precautions shall be taken to keep the risk of exposure as low as possible.

G. Ergonomics

Mental and/or physical overexertion, manual handling of heavy weights, poor postures while performing any task, repetitive movements for prolonged periods can be considered to exemplify such ergonomic factors. In order to eliminate and/or alleviate risks due to ergonomic factors;

a. Workplace shall be ergonomically designed with regard to appropriate anthropometric measurements for current and prospective employees.
b. By providing workstations fulfilling the requirements of the tasks performed, poor postures shall be avoided and remedial actions shall be taken. Adjustable workstations, where possible and practicable, shall be provided.

c. Work organization shall be established in such a way to eliminate the need of manual handling of heavy materials, or to reduce it as much as possible.
d. Proper tools and mechanical assists that reduce manual exertions and holding times and improve postures shall be employed.
e. Rest breaks of sufficient length for employees shall be allowed during work hours.
f. Job rotation shall be conducted especially for tasks that require repetitive movements within constant postures or manual handling of heavy weights.

H. Machinery And Hand Tools

1. Machinery

The employer shall take the measures necessary to ensure that the work equipment, made available to employees or self-employed persons at the workplace is suitable for the work to be carried out or properly adapted for that purpose and may be used by employees or self-employed persons, without impairment to their safety or health. Rules to be followed in the course of using machinery:

a) Machinery shall be operated for intended purpose
b) The operator shall get training on the use of machinery and be informed of safety measures and safe work practices.
c) Emergency stop button of machine and easily access during emergency shall be provided. Operator shall be informed on how and when to use the button.
d) Work equipment carrying the risk of flying or falling object shall be equipped with suitable safety devices to eliminate those risks.
e) Maximum load of lifting equipment shall be visibly marked.
f) Appropriate work method shall be selected using suitable lifting devices pertinent to type, shape and other physical features of load that shall be lifted by lifting equipment.
g) All reciprocating, rotating, and transverse moving parts shall be covered with appropriate machine guards.
h) Electrically powered machines shall be grounded.
i) Machines releasing dust, gas, vapor etc. shall be equipped with suitable ventilation systems.
j) Repair, maintenance and cleaning shall not be carried out unless the machine is stopped.
k) Work done with machine shall not expose the employee to vibration above the determined limit value.
l) Only operators shall be allowed to enter operator cabins in all types of work equipment.
m) Periodic inspection of machines shall be provided.

2. Hand tools

Hand tools include a wide variety of non-powered devices such as wrenches, pliers, hammers, and screwdrivers. Training on proper use of hand tools should be provided to employees. These tools may seem harmless, but they are known as the cause of many injuries. Rules to be followed while using a hand tool:

a) Right type and size of tool for the job shall be used.
b) Any work shall not be done with greasy or oily hands.
c) Sharp edged and pointed tools shall be handled with care.

d) All small and short work shall be secured with a vise or clamp.
e) Tools which are loose or cracked shall not be used.
f) File shall not be used without a handle.
g) Tools shall not be used for jobs they were not meant for.

I. Safe Working at Height

Working at height is defined as any job performed at an elevation difference and where injury and loss of life due to falling are possible. Only trained employee is permitted to work at height. While working at height;

a. Safety of employees shall be primarily ensured by taking collective protection measures such as platforms, scaffoldings, safety nets, air bags, safe guardrails.
b. Personal protective fall prevention measures such as safety harness and safety net which are appropriate to the nature of works being performed shall be provided.
c. Measures shall be taken to prevent employees falling from openings on the floor and openings between vertical structural components.
d. Guardrails to be used shall include a top rail, mid rail or other side protection elements to provide same protection and a toe board to prevent materials from falling. The platform decking should be covered completely.

J. Personal Protective Equipment

PPE include all protective devices, tools and materials used by the employees and manufactured in order to protect the employees from risks arising from the work being conducted affecting safety and health. Proper PPE shall be provided to employees' according to nature of work. Training should be given on proper use and maintenance of PPE. All PPEs shall;

- Prevent risks without creating additional risks.
- Be suitable for workplace conditions.
- Comply with ergonomic requirements and health status of the employees.
- Be a suitable size and fit and reasonably comfortable for the person wearing it.
- Be provided and maintain for fit for service.

COVID-19 MITIGATION MEASURES

The following table lists the health and safety risks and impacts in response to the COVID-19 outbreak. Potential mitigation measures and references to sources of additional advice and information are also provided where applicable.

S. No.	Activity	Risks and Impacts	Mitigation Measures
1	Purchase and stocking of emergency rooms, clinics and other medical facilities, including with equipment, supplies or goods.	Surfaces of imported materials may be contaminated and handling during transportation may result in spreading infection to healthcare workers and others.	• Although coronavirus can stay on surfaces for a few hours to several days depending upon the type of surface (and the differing conditions and temperatures through which the equipment is moved), it is very unlikely that that the virus will persist on a surface, even if originating in a country reporting COVID-19 cases. • If concerned (for example when dealing with goods that have come from countries with high numbers of infected people) a surface or equipment may be decontaminated using disinfectant. After disinfecting, workers should wash hands with soap and water or use alcohol -based hand rub. • No special measures are required for handling imported goods and equipment, except regular hand washing. • Projects should ensure that adequate hand washing facilities with soap (liquid), water and paper towels for hand drying (warm air driers may be an alternative), plus closed waste bin for paper towels are available. Alcohol-based hand rub should be provided where hand washing facilities cannot be accessed easily and regularly. • Also ensure awareness campaigns and reminder signs are regularly posted around site to encourage workers regularly wash hands when handling goods, and that they do not touch their face.

2	Purchase of PPE for healthcare workers and facility cleaners and staff directly involved in laboratory work	Incorrect standard or quality of PPEs leads to spread of infection to healthcare workers and cleaners.	Medical personal protective equipment (PPE) includes: 1. Medical mask 2. Gown 3. Apron 4. Eye protection (goggles or face shield) 5. Respirator (N95 or FFP2 standard) 6. Boots/closed work shoes WHO interim guidance on rational use of PPE for coronavirus disease 2019 provided further details on the types of PPE that are required for different functions.
4	Hand wash stations / points	Inadequate hand washing facilities may worsen the situation	• Projects should ensure that adequate hand washing facilities with soap (liquid), water and paper towels for hand drying (warm air driers may be an alternative), plus closed waste bin for paper towels are available. • If water and soap hand washing facilities are not possible, alcohol-based hand rubs may be provided.
5	Alcohol-based hand sanitizers	Alcohol-based hand rubs may not be as affective at controlling infection as hand washing with soap and water.	• Alcohol-based hand sanitizers are not considered as effective as hand washing with soap and water; and should therefore only be used in locations where full hand washing facilities cannot be provided. • Advice should be provided to remind users where full hand washing facilities can be found.
6	Medical/ laboratory waste contaminated with COVID-19 virus	The collection, processing, treatment and disposal of medical wastes become a vector for the spread of the virus.	• There is no evidence that direct, unprotected human contact during the handling of healthcare waste has resulted in the transmission of COVID-19. • The treatment of healthcare waste produced during the care of COVID-19 patients should be collected safely in designated containers and bags, treated and then safely disposed. • Open burning and incineration of medical wastes can result in emission of dioxins, furans and particulate matter, and result in unacceptable cancer risks under medium (two hours per week) or higher usage.

			• Alternative treatments should be designed into longer term projects, such as steam treatment methods. Steam treatment should preferably be on site, although once treated, sterile/non-infectious waste may be shredded and disposed of in suitable waste facilities. See WHO Safe management of wastes from health-care activities.
7	Water, sanitation, hygiene and waste management for COVID-19	COVID-19 virus is transmitted through inappropriate sanitation arrangements or through drinking water and contaminated waste.	• There is no evidence that COVID-19 virus persists in drinking water, sewage, or medical wastes, and following of good hygiene practices will provide effective control. • Adequate arrangement be made to dispose of effluent from laboratory/ research facilities to municipal sewerage system. See WHO guidance on water, sanitation and waste management for COVID-19 for guidance on control measures.
8	Collection of (blood / plasma samples), testing, Identification and diagnosis	Collection of samples from suspected and recovered patients from COVID-19 for research work could result in spread of disease to medical workers or laboratory workers, or during the transport of potentially affected samples.	• Collection of samples, transport of samples and testing of the clinical specimens from such persons meeting the suspect case definition should be performed in accordance with WHO interim guidance Laboratory testing for coronavirus disease 2019 (COVID-19) in suspected human cases. • Research work (including sample management) should be performed in appropriately equipped laboratories (specimen handling for molecular testing requires BSL-2/3 or equivalent facilities – as certified separately by the researcher / proponent). • All relevant staff should be trained in the relevant technical and safety procedures. • National guidelines on laboratory biosafety should be followed. There is still limited information on the risk posed by COVID-19, but all procedures should be undertaken based on a risk assessment. For more information related to COVID-19 risk assessment, see

			specific interim guidance document: WHO interim guidance for laboratory biosafety related to 2019-nCoV. • Samples that are potentially infectious materials (PIM) need to be handled and stored as described in WHO document Guidance to minimize risks for facilities collecting, handling or storing materials potentially infectious for polioviruses (PIM Guidance). For general laboratory biosafety guidelines, see the WHO Laboratory Biosafety Manual, 3rd edition.

INJURY INVESTIGATION FORM[11]

Instructions: Employees shall use this form to report all work related injuries, illnesses, or "near miss" events (which could have caused an injury or illness) – *no matter how minor*. This helps us to identify and correct hazards before they cause serious injuries. This form shall be completed by employees as soon as possible and given to a supervisor for further action.

I am reporting a work related: ❑ Injury ❑ Illness ❑ Near miss	
Your Name:	
Job title:	
Supervisor:	
Have you told your supervisor about this injury/near miss? ❑ Yes ❑ No	
Date of injury/near miss:	Time of injury/near miss:
Names of witnesses (if any):	
Where, exactly, did it happen?	
What were you doing at the time?	
Describe step by step what led up to the injury/near miss. (continue on the back if necessary):	
What could have been done to prevent this injury/near miss?	
What parts of your body were injured? If a near miss, how could you have been hurt?	
Did you see a doctor about this injury/illness? ❑ Yes ❑ No	
If yes, whom did you see?	Doctor's phone number:
Date:	Time:
Has this part of your body been injured before? ❑ Yes ❑ No	
If yes, when?	Supervisor:
Your signature:	Date:

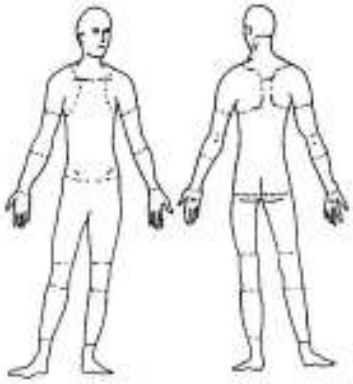
[11] Source: https://www.osha.gov/

INCIDENT INVESTIGATION REPORT

Instructions: Complete this form as soon as possible after an incident that results in serious injury or illness. (Optional: Use to investigate a minor injury or near miss that *could have resulted in a serious injury or illness.*)

This is a report of a: ❑ Death ❑ Lost Time ❑ Dr. Visit Only ❑ First Aid Only ❑ Near Miss	
Date of incident:	This report is made by: ❑ Employee ❑ Supervisor ❑ Team ❑ Other_____

Step 1: Injured employee (complete this part for each injured employee)

Name:	Sex: ❑ Male ❑ Female	Age:
Department:	Job title at time of incident:	
Part of body affected: (shade all that apply) 	Nature of injury: (most serious one) ❑ Abrasion, scrapes ❑ Amputation ❑ Broken bone ❑ Bruise ❑ Burn (heat) ❑ Burn (chemical) ❑ Concussion (to the head) ❑ Crushing Injury ❑ Cut, laceration, puncture ❑ Hernia ❑ Illness ❑ Sprain, strain ❑ Damage to a body system: ❑ Other _____	This employee works: ❑ Regular full time ❑ Regular part time ❑ Seasonal ❑ Temporary Months with this employer Months doing this job:

Step 2: Describe the incident

Exact location of the incident:	Exact time:
What part of employee's workday? ❑ Entering or leaving work ❑ Doing normal work activities ❑ During meal period ❑ During break ❑ Working overtime ❑ Other_____	
Names of witnesses (if any):	

Number of attachments:	Written witness statements:	Photographs:	Maps / drawings:

What personal protective equipment was being used (if any)?

Describe, step-by-step the events that led up to the injury. Include names of any machines, parts, objects, tools, materials and other important details.

Description continued on attached sheets: ❑

Step 3: Why did the incident happen?

Unsafe workplace conditions: (Check all that apply)
- ❑ Inadequate guard
- ❑ Unguarded hazard
- ❑ Safety device is defective
- ❑ Tool or equipment defective
- ❑ Workstation layout is hazardous
- ❑ Unsafe lighting
- ❑ Unsafe ventilation
- ❑ Lack of needed personal protective equipment
- ❑ Lack of appropriate equipment / tools
- ❑ Unsafe clothing
- ❑ No training or insufficient training
- ❑ Other: _____

Unsafe acts by people: (Check all that apply)
- ❑ Operating without permission
- ❑ Operating at unsafe speed
- ❑ Servicing equipment that has power to it
- ❑ Making a safety device inoperative
- ❑ Using defective equipment
- ❑ Using equipment in an unapproved way
- ❑ Unsafe lifting
- ❑ Taking an unsafe position or posture
- ❑ Distraction, teasing, horseplay
- ❑ Failure to wear personal protective equipment
- ❑ Failure to use the available equipment / tools
- ❑ Other: _____

Why did the unsafe conditions exist?

Why did the unsafe acts occur?

Is there a reward (such as "the job can be done more quickly", or "the product is less likely to be damaged") that may have encouraged the unsafe conditions or acts? ❑ Yes ❑ No
If yes, describe:

Were the unsafe acts or conditions reported prior to the incident? ❑ Yes ❑ No

Have there been similar incidents or near misses prior to this one? ❑ Yes ❑ No

Step 4: How can future incidents be prevented?

What changes do you suggest to prevent this incident/near miss from happening again?

❑ Stop this activity ❑ Guard the hazard ❑ Train the employee(s) ❑ Train the supervisor(s)

❑ Redesign task steps ❑ Redesign work station ❑ Write a new policy/rule ❑ Enforce existing policy

❑ Routinely inspect for the hazard ❑ Personal Protective Equipment ❑ Other: _____

What should be (or has been) done to carry out the suggestion(s) checked above?

Description continued on attached sheets: ❑

Step 5: Who completed and reviewed this form? (Please Print)

Written by:	Title:
Department:	Date:
Names of investigation team members:	
Reviewed by:	Title:
	Date:

RISK ASSESSMENT FORM

PROJECT DETAILS	
Sub-Project Name:	*Name of the sub-project to which the risk relates*
Project Manager:	*Name of the project manager responsible for mitigating the risk*

RISK DETAILS	
Risk ID:	*Unique identifier assigned to this risk*
Raised By:	*Name of person who is raising the risk*
Date Raised:	*Date on which this form is completed*

Risk Description:
Add a brief description of the risk identified and its likely impact on the project (e.g., scope, resources, deliverables, timescales and/or budgets)

Risk Likelihood: (L/M/H)	Risk Impact: (L/M/H)
Describe and rate the likelihood of the risk eventuation (i.e., Low, Medium or High)	*Describe and rate the impact on the project if the risk eventuates (i.e., Low, Medium or High)*

RISK MITIGATION

Recommended Preventative Actions:
Add a brief description of any actions that should be taken to prevent the risk from eventuating

Recommended Contingent Actions:
Add a brief description of any actions that should be taken, in the event that the risk happens, to minimize its impact on the project

APPROVAL DETAILS

Supporting Documentation:
Reference any supporting documentation used to substantiate this risk

Signature: **Date:**

_____ ___/___/____

PLEASE FORWARD THIS FORM TO THE PROJECT MANAGER

Additional Assessment

No	What is the hazard?	Who might be harmed?	How might people be harmed?	Existing risk control measure	Risk rating			Additional Controls	New Risk Rating			Action Monitored by Whom	Action Monitored by When
					L	C	R		L	C	R		
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													