



**PUNJAB CENTRAL BUSINESS DISTRICT (CBD)
DEVELOPMENT AUTHORITY
GOVERNMENT OF PUNJAB**

**SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE
TO KALMA CHOWK, LAHORE**



ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

FEBRUARY, 2024



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SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

Environmental Impact Assessment Report (EIA)

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

Lahore is Pakistan's second largest city with a population of around eleven million (census 2017) people. It is a regional urban center of key commercial, financial, industrial and socio-cultural significance. Over the years, rapid urbanization has changed the socio-economic and physical characteristics of Lahore. Due to lack of / insufficient infrastructure facilities, unprecedented and un-planned growth of population has contributed towards deterioration in lifestyle of general public.

For the sustainable economic development of any city, congestion alleviation and ensuring an excellent transport system is one of the most important tasks. The economic development has been leading urban traffic states to more critical situations and cities in developing countries are facing this problem the most because traffic congestion is very frequent and has become a normal phenomenon in big cities. A good transportation system in city is very important for sustainable urban development.

Garden Town is one of the most urbanized areas in Lahore. The existing roads, including Canal Road, Bhekewal More, Kalma Chowk, Barakat Market Chowk, Campus Bridge, Capt. Jawad Shaheed Road and Shabbir Usmani Road already face traffic congestion during peak hours. In order to cope with traffic issues and to control this situation, CBD has proposed some improvements.

The proposed Project aims Signal Free Corridor from Bhekewal More to Kalma Chowk including Grade Separation at Barakat Market Chowk and At Grade Improvement at Campus Bridge that involves construction of the underpass from Barket Market to Canal Road, underpass from Jinnah Hospital to Kalma Chowk for smooth traffic flow and to avoid disruption to the existing traffic in the vicinity.

Punjab Central Business District (CBD) Development Authority has engaged National Engineering Services Pakistan (NESPAK) Limited to provide Consultancy Services for the preparation of Environmental Impact Assessment (EIA) study of the proposed Project, to fulfill the requirements of the Punjab Environmental Protection Agency (Punjab-EPA).

1.2 REQUIREMENT FOR EIA STUDY OF THE PROPOSED PROJECT

The Proposed Project is located in Punjab Province, therefore the Punjab Environmental Protection Act, 1997 (Amended 2012 & 2017) is the core environmental law for the Proposed Project. Under Section 12 (1) EIA is mandatory for the subject project, which states that:

"No proponent of a project of public and private sector shall commence construction or operation unless he has filed an Initial Environmental Examination / Environmental Impact Assessment with the Punjab Environmental Protection Agency, as the case may be, or,



where the project is likely to cause adverse environmental effects; and has obtained approval from the Provincial Agency in respect thereof”.

According to the Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations 2022, the proposed project falls under Category D “Transport” of the Schedule-II. This category requires an EIA study to be conducted for transportation and road projects to initiate the process of environmental approval.

1.3 OBJECTIVE OF EIA

The prime objective of the EIA study is to fully meet the statutory requirements set forth by the Punjab Environmental Protection Act, 1997 (Amended 2012 & 2017) to facilitate decision making by the Punjab-EPA regarding grant of No Objection Certificate (NOC)/ Environmental Approval for the Proposed Project.

The overall objective of this EIA is to elucidate the anticipated aspects of the proposed intervention and to propose necessary mitigation measures to prevent/minimize adverse impacts on surrounding environment and community. To achieve this objective, an assessment of the existing environmental conditions of the project’s Corridor of Impact (COI) is a prerequisite. Therefore, baseline data of major environmental attributes has been acquired from primary and secondary sources. This EIA has been prepared to ensure adequate environmental and social management during pre-construction, construction and implementation stages of the proposed Project. It provides mechanisms to ensure that potentially significant environmental and social impacts of the proposed Project are identified, assessed and mitigated as appropriate.

Specific objectives of this EIA report are to:

- Facilitate proponents of the Project in ensuring environmental and social sustainability of the Project;
- Establish a baseline of existing social and environmental conditions prior to Project initiation by collecting secondary data/ information on physical, biological and socio-economic environment of the Project area;
- Identify potentially significant environmental and social impacts (both positive and negative) during all stages of the Project;
- Avoid, minimize, and suggest mitigation measures for significant adverse impacts;
- Conduct, record and report and ensure consultations with major stakeholders; and
- Provide an Environmental Monitoring Framework and institutional arrangements for the proposed Project as a tool for the implementation of the suggested measure and evaluation mechanism with adequate resources including implementing agencies capacity building.

1.4 NATURE, SIZE AND LOCATION OF THE PROJECT

The proposed Project involves construction of At-Grade Protected U-Turns, flyover and two underpasses. The proposed Project is planned in an integrated manner to provide Signal Free Corridor from Bhekewal More to Kalma Chowk including Grade Separation at Barakat



Market Chowk and At Grade Improvement at Campus Bridge. **Figure 1.1** shows the Location Map of the proposed Project and **Figure 1.2** shows Project accessibility map.

1.5 ROJECT PROPONENT

Proponent details of the proposed Project are provided here under:

Mr. Imran Amin (Chief Executive Officer)
Punjab Central Business District (CBD) Development Authority
Executive Lounge, Walton Airport, Ferozpur Road, Lahore, Punjab 54000
Telephone Number: 0305 5550344

1.6 PROJECT CONSULTANT

The details of Consultant are provided below:

National Engineering Services Pakistan (Pvt.) Limited (NESPAK)
NESPAK House: 1-C, Block-N, Model Town Extension, Lahore, 54700,
(P.O. Box 1351), Pakistan
Telephone Number: 92-42-99090233
Fax Number: 92-42-99231950
E-mail Address: info@nespak.com.pk
Website: www.nespak.com.pk

1.7 CONSULTANT'S EIA TEAM

Based on the requirements of the study, NESPAK formed a team of experts comprising a team leader (Environmental Specialist) with professional support from the Environmental Scientists, Sociologist and Ecologist. The professional staff was involved in analyzing the data, impact assessment and mitigation measures and report compilation. In addition, the EIA team worked in close coordination with the design team and several inputs were provided by the design specialists to the EIA team. Detail of EIA team is given in **Table 1.1** below:

Table 1.1: Team Composition for the EIA Study

Sr. No.	Name of Expert	Designation
1.	Mr. Jamshed Faisal	Project Manager
2.	Muhammad Shariq Ahmed	Team Leader/Head ERSD
3.	Ms. Shehnila Hanif	EIA Expert
4.	Ms. Ridha Kamran	Senior Environmental Scientist
5.	Mr. Kamran Ahmad	Senior Sociologist
6.	Mr. Ibadullah Khan	Senior Ecologist

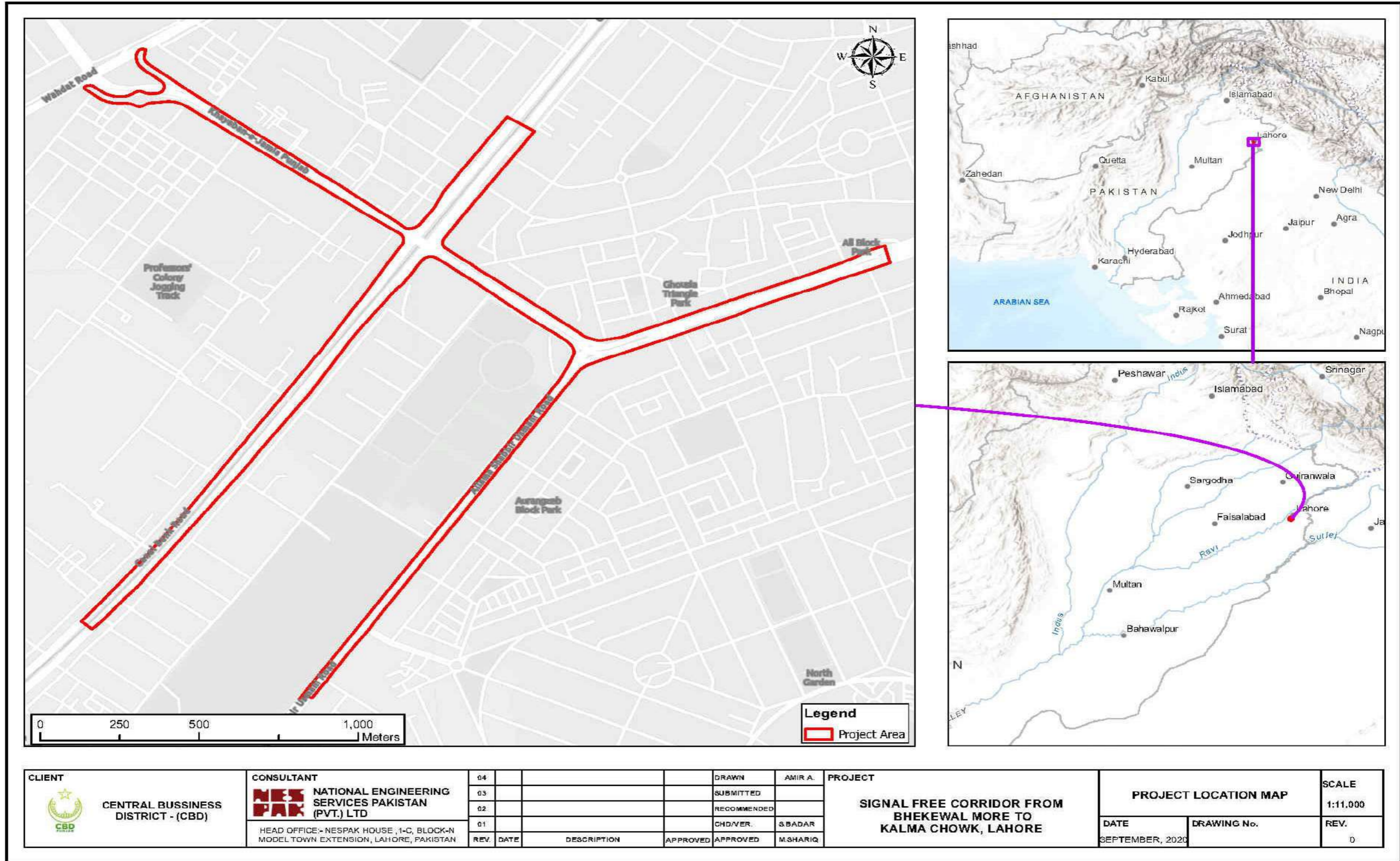


Figure 1-1: Location Map of the Proposed Project

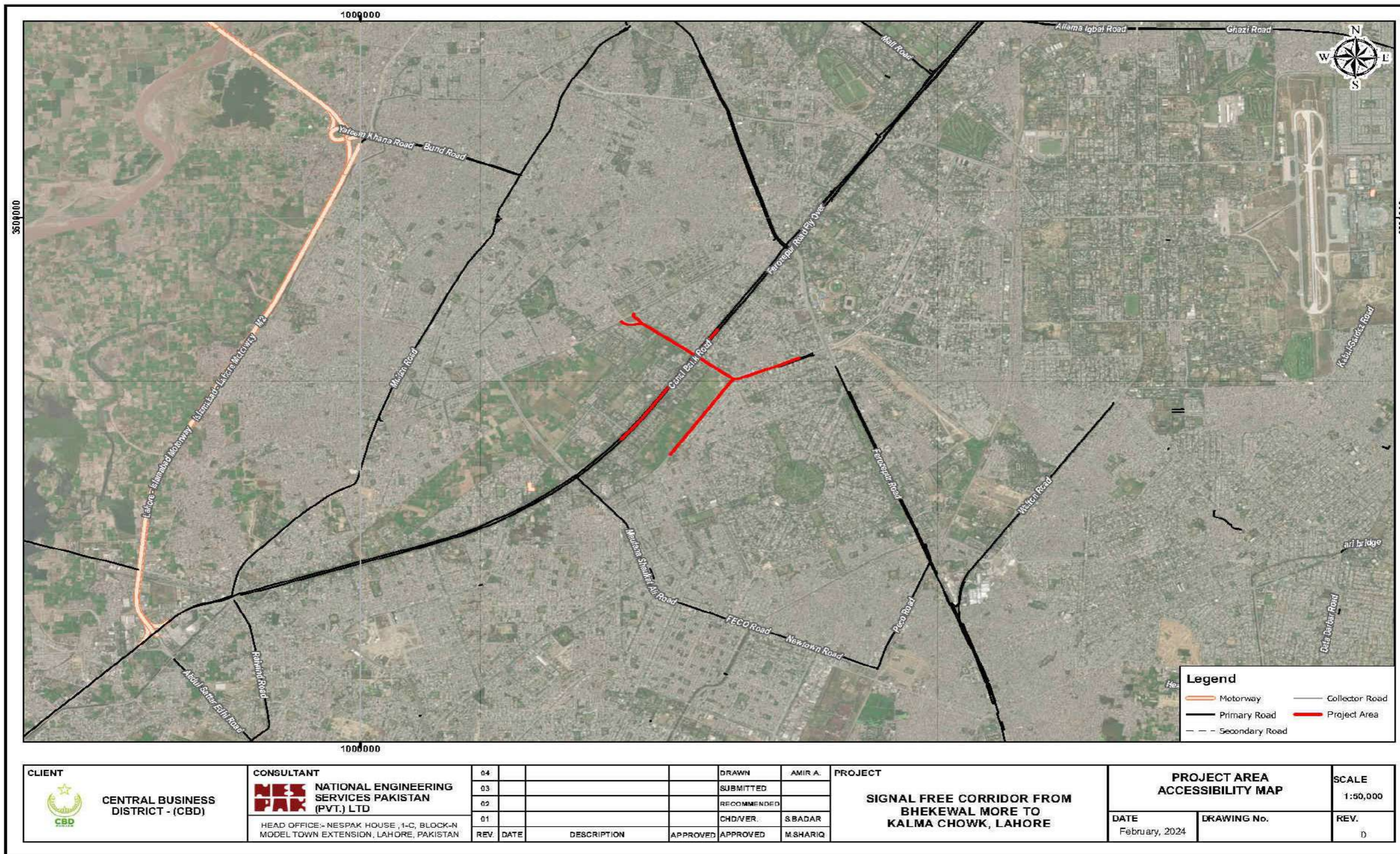


Figure 1-2: Project Area Accessibility Map



1.8 APPROACH AND METHODOLOGY

The following approach and methodology were adopted for carrying out the EIA study of the proposed project:

1.8.1 Orientation

Meetings and discussions were held among the members of the EIA Consulting Team. This activity was aimed at achieving a common ground of understanding of various issues of the study. Subsequent to the concept clarification and understanding, a detailed data acquisition plan was developed for the internal use of the EIA consulting team. The plan identified specific data requirements and their sources; determined time schedules and responsibilities for their collection; and indicated the logistics and facilitation needs for the execution of the data acquisition plan.

1.8.2 Desktop Studies

Prior to mobilization, the consultants conducted a desktop study through collection and review of guidelines, data and reports related to the proposed project, that included (a) review of National Environmental Legislations; (b) Google Earth Satellite Imagery; (c) Relevant District Census Reports (DCR) and other relevant documents/drawings; and (d) Data available in previously conducted studies; *Census Survey by Pakistan Bureau of Statistics, 1998 and 2017 for socio-economic data; and other design data provided by the Client.*

1.8.3 Review of Environmental Laws and Institutional Requirements

All applicable national and international laws, legislations, guidelines along with relevant international protocols were reviewed relevant to the proposed project components.

1.8.4 Delineation of Study Area / Corridor of Impact (COI)

For an EIA Study, a clear delineation of the Study Area / Corridor of Impact (COI) is required. Study Area / COI is the area within which the potentially significant impacts of the proposed Project activities (direct or indirect) are envisaged. In this report, the Study Area / COI is the area where the Project impacts has been accessed on the environment due to the proposed Project activities.

Based on the available Google Earth Imagery and ARC GIS software, Project footprints were overlaid on the existing Project Area Imagery. Utilizing the information collected through the detailed site visit, consultations with the locals and concerned departments and foreseen impacts of the proposed Project, a COI of 25m from Project boundary (as shown in **Figure 1.2**) was delineated for Project components.

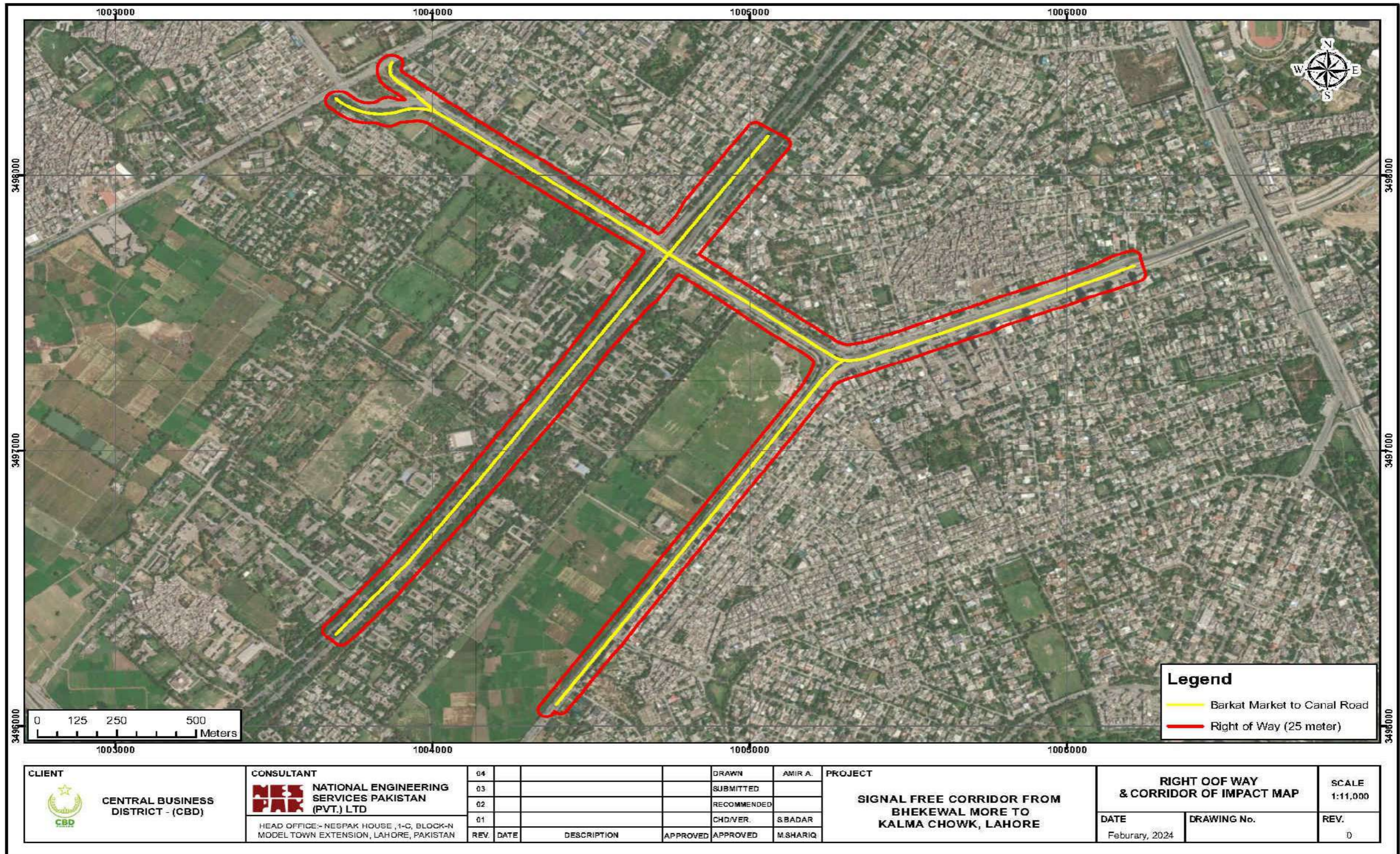


Figure 1-3: COI Map of the Proposed Project



1.8.5 Survey of COI

A team of Environmental Scientists, Ecologist and Sociologist carried out the environmental and social survey of the COI to familiarize themselves with the local conditions and the environmental settings. During the survey, the information regarding the topography, soils, surface water, groundwater, flora & fauna, affected infrastructure, social settings and major settlements along the COI were observed.

1.8.6 Environmental Baseline Survey of the Project

Detailed environmental and social survey was carried out within the COI as mentioned before. For data collection, formal meetings were held and data collected through visual observations, interviews with the local residents and officials. In order to collect the relevant published information, government offices were also visited.

Prior to the start of field activities comprehensive checklists, proformas and maps were developed to collect the information related to following parameters:

Physical Environment

The information acquired for the establishment of physical environment baseline included the following main parameters:

- Land resources (including landuse pattern, soil composition, contamination of soil and soil erosion etc.);
- Water resources (including available surface and groundwater resources and natural streams, hydrology, spring water, water supply, water contamination etc.);
- Climate data (including temperature, rainfall, humidity, wind speed and direction etc.);
- Ambient air quality and noise level monitoring data;
- Existing solid waste management and effluents disposal practices and storm water drainage;
- Buildings and infrastructure details, including residential, commercial and animal shed for complete/partial relocation;
- Religious, cultural and heritage information (mosques, shrines, graveyards);
- Archaeological monuments; and
- Other private/public infrastructures such as roads, telephone poles, hand pumps, tube wells etc.

Ecological Environment

The status of the flora and fauna of the study area were determined by a review of literature of the area, and an assessment of both terrestrial and aquatic environments.



a) Flora

The vegetative communities were identified and classified into community types. Identification was carried out of dominant tree species, assessment of stage of growth (mature or sapling), etc.

b) Fauna

Information on fauna was gathered from existing literature on reported species as well as from observations in the field.

c) Endangered Species

Data/ information of endangered species (both flora and fauna, if any) was collected.

Socio-Cultural Environment

The consultants utilized a combination of literature, field investigations, census report, meetings through public consultation and interviews to describe the existing social environment and assessment of the potential impact of the construction of the proposed project. Data was gathered on the following aspects of the social environment:

- Land use and Municipal Status;
- Demographics;
- Livelihoods;
- Community Facilities;
- Solid Waste Management;
- Proposed Developments;
- Archaeological and Cultural Heritage; and
- Identification and Evaluation of Environmental Impacts.

1.8.7 Stakeholder Consultations

The Consultant identified Project stakeholders and held meetings with them during the surveys to receive feedback on the expected environmental issues related to the Project and suggested mitigation measures. Meetings were carried out with the local public, relevant departments including Lahore Development Authority (LDA), Punjab University, Environment Department, Forest and Wildlife Department, Punjab Horticulture Authority (PHA), etc. to discuss the issues/constraints and get their views and feedback to mitigate the potential environmental as well as social impacts associated with the implementation and operation of the Project.

1.8.8 Screening of Potential Environmental Impacts and Mitigation Measures

Based on the generally established baseline conditions in the adjacent as well as in the Project Area, potential physical, ecological and social impacts of the proposed Project were identified, evaluated and quantified, wherever possible. A logical and systematic approach



was adopted for impact identification and assessment by utilizing a combination of the secondary data, satellite imagery, environmental checklists, socioeconomic survey proformas, field observations and discussion with the local residents of the Project Area. To mitigate the significant adverse impacts, adequate mitigation measures and implementation framework were proposed so that the proponent could incorporate them beforehand in the design phase.

1.8.9 Environmental Monitoring Program and Institutional Requirements

An Environmental Monitoring Program and Institutional Requirements has been prepared to ensure the adequacy and effectiveness of the suggested mitigation measures by clearly identifying the roles and responsibilities of the agencies, monitoring mechanism, monitoring plan for environmental and social parameters to be monitored with their frequency, existing and suggested framework, necessary approvals and the required further studies. Similarly, costs for environmental monitoring and social component/social mitigation measures were also estimated.

1.9 STRUCTURE OF THE REPORT

Section 1 “**Introduction**” briefly presents the project background, objectives, methodology and need of the EIA study.

Section 2 “**Legal and Administrative Framework**” comprises policy guidelines, statutory obligations and roles of institutions concerning EIA study of the proposed Project.

Section 3 “**Description of the Project and Alternatives**” furnishes information about the studied alternatives, location of the proposed Project, cost and size of the Project, its major components and alternatives considered for the proposed Project to select at the preferred alternative for detailed environmental assessment.

Section 4 “**Description of Environment**” describes physical, biological and socio-economic conditions prevalent in the Project area.

Section 5 “**Public Consultation**” identifies the main stakeholders and their concerns raised through scoping sessions, and deals with the measures to mitigate the social impacts.

Section 6 “**Anticipated Environmental Impacts and Mitigation Measures**” identifies and evaluates impacts of the project activities during the construction and operation stages and recommends with the measures proposed to mitigate potential environmental impacts of the road Project.

Section 7 “**Environmental Management Plan**” outlines environmental mitigation plan, institutional arrangements for the implementation of the proposed mitigation measures, monitoring requirements, monitoring cost etc.



Section 8 **“Conclusion and Recommendations”** elaborates the conclusion of subject environmental study and suggests the recommendations to address the issues raised from proposed construction activities.



2 LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 GENERAL

This section provides an overview of the policy framework and legislation that applies to control the environmental consequences as a result of proposed project implementation and operation. The project needs to comply with all the applicable environmental policies, laws, guidelines, acts and legislations of Government of Pakistan and provincial government.

2.2 SUMMARY OF RELEVANT STRATEGIES, POLICIES, ACTS AND LEGISLATION

The summary of major relevant strategies, policies, acts and legislation from environmental perspective are briefly described in **Tables 2.1 & 2.2** below:

Table 2.1: Main Strategies/Policies Related to Environment and their Relevance to the Project

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to Project
1	National Conservation Strategy, 1992	Pakistan National Conservation Strategy (NCS), which was approved by the federal cabinet in March 1992, is the principal policy document on environmental issues in the Country. The NCS outlines the Country's primary approach towards encouraging sustainable development, conserving natural resources and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment.	The core areas that are relevant in the context of the proposed project are pollution prevention during construction, conserving biodiversity and supporting forestry and plantation.
2	National Environmental Policy, 2005	In March 2005, GoP launched its National Environmental Policy, which provides a framework for addressing the environmental issues. Section 5 of the policy commits for integration of environment into development planning as instrument for achieving the objectives of National Environmental Policy. It also provides broad guidelines to the Federal Government, Provincial Governments, Federally Administered Territories and Local Governments to address their environmental concerns and to ensure effective management of their environmental resources.	Clause (b) of sub-section 5.1 states that Environmental Assessment related provisions in Environmental Protection Act, 1997, will be diligently enforced for all developmental projects.
3	National Climate Change Policy,	The National Climate Change Policy provides a framework for addressing the	This policy document is a 'living' document and will be



Sr. No.	Policy/Strategy	Brief Coverage	Relevance to Project
	2012	<p>issues that Pakistan faces or will face in future due to the changing climate. In view of Pakistan's high vulnerability to the adverse impacts of climate change, in particular extreme events, adaptation effort is the focus of this policy document. The vulnerabilities of various sectors to climate change have been highlighted and appropriate adaptation measures spelled out.</p> <p>The policy covers measures to address issues in various sectors such as water, agriculture, forestry, coastal areas, biodiversity and other vulnerable ecosystems.</p> <p>Notwithstanding the fact that Pakistan's contribution to global Greenhouse Gas (GHG) emissions is very small, its role as a responsible member of the global community in combating climate change has been highlighted by giving due importance to mitigation efforts in sectors such as energy, forestry, agriculture and livestock.</p> <p>Furthermore, appropriate measures relating to disaster preparedness, capacity building, institutional strengthening; technology transfer; introduction of the climate change issue in higher education curricula; ensuring environmental compliance through Initial IEE and EIA in the development process; addressing the issue of deforestation and illegal trade in timber; promoting Clean Development Mechanisms (CDM); and raising Pakistan's stance regarding climate change at various international forums, have also been incorporated as important components of the policy.</p> <p>The policy thus provides a comprehensive framework for the development of Action Plans for national efforts on adaptation and mitigation.</p>	<p>reviewed and updated regularly to address emerging concepts and issues in the ever-evolving science of climate change.</p> <p>This policy will accelerate due to the emissions from the construction machinery and equipment.</p>



Sr. No.	Policy/Strategy	Brief Coverage	Relevance to Project
4	National Drinking Water Policy, 2009	The National Drinking Water Policy provides a framework for addressing the key issues and challenges facing Pakistan in the provision of safe drinking water to the people. Drinking water is the constitutional responsibility of the provincial governments and the specific provision function has been devolved to specially created agencies in cities and Town and Tehsil Municipal Administrations under the Local Government Ordinance 2001.	This policy is applicable for the proposed project during construction phase in terms of regular water quality monitoring.
5	National Water Policy, 2018	The National Water Policy aims at efficient management and conservation of existing water resources, optimal development of potential water resources, steps to minimize time and cost overruns in completion of water sector projects, improving urban water management by increasing system efficiency and reducing non-revenue water through adequate investments to address drinking water demand, sewage disposal, handling of wastewater and industrial effluents; equitable water distribution in various areas and canal commands, measures to reverse rapidly declining groundwater levels in low-recharge areas, increased groundwater exploitation in high-recharge areas, effective drainage interventions to maximize crop production, improved flood control and protective measures, steps to ensure acceptable and safe quality of water, minimization of salt build-up and other environmental hazards in irrigated areas, institutional reforms to make the managing organizations more dynamic and responsive.	The core areas that are relevant in the context of the proposed project are drinking water demand, sewage disposal, handling of wastewater.



Sr. No.	Policy/Strategy	Brief Coverage	Relevance to Project
6	National Forest Policy, 2015	<p>The goal of this policy is to expansion, protection and sustainable use of national forests, protected areas, natural habitats and watersheds for restoring ecological functions, improving livelihoods and human health in line with the national priorities and international agreements.</p> <p>In line with the Federal functions of national policy, planning and implementation of international agreements, specific objectives of the National Forest Policy include:</p> <ol style="list-style-type: none">a) Promoting ecological, social and cultural functions of forests through sustainable management and use of forest produce including wood and non-wood forest products;b) Implementing a national level mass afforestation programme to expand and maintain optimum forest cover;c) Maximizing forest areas by investing in available communal lands/ shamlat, and Guzara forests and urban forestry;d) Facilitating and harmonizing inter-provincial movement, trade and commerce of wood and non-wood forest products through the Federal Forestry Board;e) Inter-linking natural forests, protected areas, wetlands and wildlife habitats to reduce fragmentation;f) Enhancing role and contribution of forests in reducing carbon emissions and enhancing forest carbon pools;g) Facilitating implementation of international conventions and agreements related to Forestry, Wetlands, Biodiversity and Climate Change; andh) Promoting standardized and harmonized scientific forest planning, research and education including for community-based management.	<p>The proposed Project dose not involves any national forests, protected areas, natural habitats and watersheds, so this policy is not applicable.</p>
7	Pakistan Labour Policy, 2010	<p>The main objective of the Labour Policy, 2010 is the social and economic well-being of the labour of Pakistan. The Labour Policy, 2010 has following 4 parts:</p> <ul style="list-style-type: none">• Legal Framework;• Advocacy: rights of workers and employers;• Skill development and employment;	<p>The labour force will be employed for construction of the proposed Project. The provision of policy will apply to all the employed labourers.</p>



Sr. No.	Policy/Strategy	Brief Coverage	Relevance to Project
		and • Manpower export.	
8	National Disaster Risk Reduction Policy, 2013	NDMA, being the lead focal agency for disaster preparedness and management, has therefore, embarked upon formulation of a comprehensive National Disaster Risk Reduction Policy through wider consultations with all stakeholders including all provinces, state of AJ&K and regions. This policy covers disasters risk reduction in a more holistic way and introduces a proactive and anticipatory approach by laying special emphasis on risk assessment and prevention.	This policy will be elicited if any unforeseen natural and man-made disaster occurs during construction and operation phase.
9	National Action Plan for COVID-19 Pakistan	Government of Pakistan has launched the National Action Plan for COVID-19 Pakistan to combat the challenge of prevailing virus, also available at https://www.nih.org.pk/wp-content/uploads/2020/03/COVID-19-NAP-V2-13-March-2020.pdf . The Government of Pakistan has launched the real-time data portal for COVID-19 http://covid.gov.pk/ . These measures are mostly relating to the containment and awareness and capacity building. Besides this COVID-19 daily situation report is also available at https://www.nih.org.pk/wp-content/uploads/2020/04/COVID-19-Daily-Updated-SitRep-03-April-2020.pdf .	This Action Plan for COVID-19 is applicable to the proposed project as it is being launched during this pandemic.

Table 2.2: Main Legislation/Acts Related to Environment and their Relevance to the Project

Sr. No.	Act	Brief Coverage	Relevance to Project
1	Punjab Environmental Protection Act, 1997 (Amended, 2012 & 2017)	The Punjab Environmental Protection Act, 1997 (Amended, 2012 & 2017) is comprehensive legislation and provides the legislative framework for protection, conservation, rehabilitation and improvement of the environment. The 'environment' has been defined in the Act as: (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d)	The provision of the act is applicable to proposed Project for conducting an IEE/EIA according to section 12 and to obtain environmental approval from the EPA. The section 11 of the act is applicable in term of compliance with Punjab



Sr. No.	Act	Brief Coverage	Relevance to Project
		<p>the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the interrelationships between any of the factors specified in sub-clauses 'a' to 'f'.</p> <p>The notable points of the law are:</p> <ul style="list-style-type: none">• No proponent of a project shall commence construction or operation unless he has filed an IEE/EIA with the Provincial Agency designated by the Provincial EPAs an EIA, and has obtained an approval;• Establishment and formation of the Punjab Environmental Protection Council(PEPC);• Prohibition of certain discharges or emissions;• Punjab Environmental Quality Standards (PEQS) for wastewater, air emissions and noise; and• Provincial Government can issue notices and enforce them to protect the environment. <p>In the recent amendment of 2012, legislatives powers related to environment and ecology are given to provincial governments from the Federal government. The provinces are required to enact their own legislation for environmental protection. Other amendments include increasing the penalties for violations.</p> <p>For the proposed Project, Environmental Protection Department (EPD)/Environmental Protection Agency (EPA), Government of Punjab (GoPb) is the concerned authority. The capability of regulatory institutions for environmental management is ultimately responsible for the success of environmental assessments and that development projects are environmentally sound and sustainable.</p>	<p>Environmental Quality Standards (PEQS). Similarly, section 13 of the act prohibits the import of hazardous waste. The provisions of section 16 are also applicable to comply with the discharge or emission of any effluent, waste, air pollutant or noise or disposal of waste or handling of hazardous substance. Under section 17, penalties will apply if anyone fails to comply with the provisions of section 11, 12, 13 and 16.</p>



Sr. No.	Act	Brief Coverage	Relevance to Project
2	Punjab Environmental Protection Agency, (Review of IEE and EIA) Regulations, 2022	<p>These regulations set out:</p> <ul style="list-style-type: none">• Key policy and procedural requirements for filing an EIA;• The purpose of environmental assessment;• The goals of sustainable development;• The requirement that environmental assessment be integrated with feasibility studies;• The jurisdiction of the Federal and Provincial EPA's and Planning & Development (P&D) Departments;• The responsibilities of proponents;• Duties of responsible authorities;• Provides schedules of proposals that the project requires either IEE or an EIA;• The environmental screening process of the projects under schedule I, II and III; and• The procedure for the environmental approval for filing the case with the concerned EPA for the granting of the NOC.	<p>The provisions of these regulations are applicable for environmental screening of the project, which implies that an EIA is required for the proposed project. The process described in the regulation will be useful for client to follow the procedure to file an EIA with Punjab EPA and to understand its review process along with timelines to be followed.</p>
3	Punjab Environmental Quality Standards (PEQS), 2016	<p>PEQS promulgated recently in 2016. Specified standards under PEQS are for:</p> <ul style="list-style-type: none">• Drinking Water;• Ambient Air;• Noise;• Industrial Gaseous Emissions;• Municipal and Liquid Industrial Effluents;• Motor vehicle exhaust and noise; and• Treatment of Liquid and Bio-Medical Waste.	<p>All projects to be implemented in Punjab must conform to PEQS during all the phases i.e. construction and operation.</p>
4	Guidelines for the Preparation and Review of Environmental Reports, 1997	<p>These guidelines describe the format and content of IEE/EIA reports to be submitted to Punjab-EPA for obtaining NOC/approval. The guidelines present:</p> <ul style="list-style-type: none">• The environmental assessment report format;• Assessing impacts;• Mitigation and impact management and preparing an environmental management plan;• Reporting;• Review and decision making;• Monitoring and auditing; and• Project Management.	<p>The guidelines are applicable for the preparation of the EIA.</p>



Sr. No.	Act	Brief Coverage	Relevance to Project
5	Guidelines for Environmental Assessment	<p>Pak-EPA has published a set of environmental guidelines for conducting environmental assessments and the environmental management of different types of development Projects. The guidelines that are relevant to the proposed Project are listed below.</p> <ul style="list-style-type: none"> • Guidelines for the Preparation and Review of Environmental Reports, Pakistan Environmental Protection Agency, 1997; • Guidelines for Public Consultation, Pakistan Environmental Protection Agency, May, 1997; and • Sectoral Guidelines: Pakistan Environmental Assessment Procedures, Pakistan Environmental Protection Agency, October 1997. 	The guidelines are applicable for the preparation of the EIA.
6	Punjab Wildlife Act, 1974	The Punjab Wildlife Act (1974) is developed for the regulation of activities relating to protection, conservation and management of wildlife in Punjab.	The proposed project involves the cutting of trees which may result in loss of habitat, therefore, the provisions of this law are applicable.
7	Punjab Plantation and Maintenance of Trees Act, 1974	The Punjab Plantation and Maintenance of Trees Act, (1974) regulates tree plantations and enforces measures for their protection.	The requirements of this act are applicable in terms of planting new trees and their maintenance by the occupier of the existing land who would have the physical possession.
8	Protection of Trees and Brushwood Act, 1949	The Protection of Trees and Brushwood Act, 1949 prohibits cutting or chopping of trees and brushwood without prior permission of the relevant department in the provincial government.	The proposed Project may involve tree cutting, therefore, the provisions of this law will be applicable.
9	Pakistan Antiquities Act 1975 & Punjab Antiquities Amendment Act 2012	<p>The Punjab Antiquities Amendment Act, 2012 is adopted from the Pakistan Antiquities Act of 1975 with a few minor changes. The Antiquities Act, 1975 (amended in 1990) states the following:</p> <ul style="list-style-type: none"> • “Ancient” is any object that is at least 75 years old; • All accidental discoveries of artefacts must be reported to the Federal Department of Archaeology; • The Government is the owner of all buried antiquities discovered on any site, whether protected or otherwise; • All new construction within a distance of 200 feet from protected antiquities is forbidden; 	<p>The law will be applicable to the project mainly due to its two provisions:</p> <ul style="list-style-type: none"> ▪ According to the law, any construction activity within 61 m or 200 ft. of protected antiquities, are prohibited. <p>The provisions of this act would also be applicable, if any accidental archaeological discoveries may occur during the excavation works for the construction of proposed Project.</p>



Sr. No.	Act	Brief Coverage	Relevance to Project
		<ul style="list-style-type: none"> No changes or repairs can be made to a protected monument, even if it is owned privately, without approval of the responsible authorities; and The cultural heritage laws of Pakistan are uniformly applicable to all categories of sites regardless of their state of preservation and classification as monuments of national or world heritage. 	
10	The Punjab Special Premises (Preservation), Ordinance, 1985	The Punjab Special Premises (Preservation), Ordinance (1985) provides the legal framework for preservation of premises of historical, cultural, archaeological, and architectural value in the Punjab province. This legislation empowers the provincial government to notify heritage sites and sites of cultural and archaeological importance and to prohibit implementation of developmental schemes or new constructions within the notified areas around the special premises. So far 246 sites stand notified under the Punjab Ordinance.	<p>The provision of the ordinance is applicable for protection and conservation of special premises declared by department of Youth Affairs, Sports, Archeology & Tourism, Punjab.</p> <p>The ordinance is applicable in terms of land acquisition, entrance, exploitation and destruction of special premises near site.</p>
11	Pakistan Penal Code, 1860	The Code deals with the offences where public or private property or human lives are affected due to intentional or accidental misconduct of an individual or organization. The Code also addresses control of noise, noxious emissions and disposal of effluents.	The provisions of the Penal Code, 1860 are applicable to the project in terms of penalties for effecting human lives and public property. It also addresses the control of noise, air emissions and effluent disposal.
12	Labour Laws as part of Constitution of Pakistan 1973,	<p>The Constitution of Pakistan contains a range of provisions with regards to labour rights, in particular:</p> <ul style="list-style-type: none"> Article 11 of the Constitution prohibits all forms of slavery, forced labour and child labour; Article 17 provides a fundamental right to exercise the freedom of association and the right to form unions; Article 25 lays down the right to equality before the law and prohibition of discrimination on the grounds of sex alone; and Article 37(e) makes provision for securing just and human conditions of work, ensuring that children and women are not employed in vocations unsuited to their age or sex, and for maternity benefits for women in employment. 	<p>The labour laws will be relevant as it would deal with employment of labour for the construction of propose project.</p> <p>Following are the major labour laws which are applicable to the project:</p> <ul style="list-style-type: none"> Bonded Labour System (Abolition) Act, 1992 Employment of Child Act, 1991 Minimum Wages Ordinance, 1961 Industrial Relations Act, 2010 West Pakistan Minimum Wages for Unskilled Workers' Ordinance, 1969



Sr. No.	Act	Brief Coverage	Relevance to Project
		<p>Labour law is controlled at both provincial and national levels with compulsory employment agreements containing the terms set out by the labour laws. The labour laws are a comprehensive set of laws in Pakistan dealing with the following aspects:</p> <ul style="list-style-type: none">• Contract of Employment;• Termination of Contract;• Working Time and Rest Time;• Working hours;• Paid Leave;• Maternity Leave and Maternity Protection;• Other Leave Entitlements;• Minimum Age and Protection of Young Workers;• Equality• Pay Issues;• Workers' Representation in the Enterprise;• Trade Union and Employers Association Regulation; and• Other Laws.	
13	Employment of Children Act, 1991	<p>Article 11(3) of the Constitution of Pakistan prohibits employment of children below the age of 14 years in any construction, or any other hazardous employment.</p> <p>In accordance with this Article, the Employment of Child Act 1991 prohibits child labour (a child is under 14 years old).</p>	The relevance of this act to the project will be to prohibit child employment for construction of the proposed project.
14	Pakistan Climate Change Act, 2017	This Act aims to meet obligations under international conventions relating to climate change and to provide for adoption of comprehensive adaptation and mitigation policies, plans, programmes, projects and other measures required to address the effects of climate change and for matters connected herewith and ancillary thereto.	This Act will accelerate due to the emissions from the construction machinery.
15	National Clean Air Act, 2000	The Act aims to control vehicular emissions, pollution from industry, and indoor air pollution in rural and urban areas.	This Act will trigger if vehicles and machinery used for construction activities emanate air pollutants above the permissible limit.
16	Punjab Parks and Horticulture Authority Act, 2012	This act entails regulation, development, and maintenance of public parks, green belts and green areas in the Punjab; regulation of billboards, sky signs and outdoor advertisements; to promote open and unrestricted views of the Punjab.	This act will trigger as green belts along the proposed project route will be affected during construction phase.



Sr. No.	Act	Brief Coverage	Relevance to Project
17	Land Acquisition Act (LAA), 1894 Including Later Amendments	The Land Acquisition Act, 1894, is a “law for the acquisition of land needed for public purposes and for companies and for determining the amount of compensation to be paid on account of such acquisition”. The exercise of the power of acquisition has been limited to public purposes. The principles laid down for the determination of compensation, as clarified by judicial pronouncements made from time to time, reflect the anxiety of the law-giver to compensate those who have been deprived of property, adequately. The land needed for the construction of development projects will be acquired under normal conditions based on prevailing market prices or negotiated prices between client and the owners of land. Section 17(4) of the LAA will not be used in the absence of an emergency. Instead, the land will be purchased under willing-seller willing-buyer deal at agreed upon market rates and the seller will have the option not to sell the land, in case an acceptable deal for both the parties is not reached.	This Act will anticipate if proposed project involves permanent acquisition of land in the project area.
18	Punjab Municipal Water Act, 2014	The basic aim of the Act is to recognize, regulate and manage present and future municipal water supply and sanitation services and to establish rights of access to basic water supply and basic sanitation, and to ensure conservation of water resources in the Province. This Act is in draft stage.	This Act will elicit if there is misappropriation of water supply during construction activities.
19	The Punjab Polythene Bag Rules, 2004	This rule prohibits the manufacturing, sale, use and import of polythene bags that is below 15-micron thickness.	This rule will be applicable if polythene bags with more than 15-micron thickness used during construction activities.
20	The Punjab Water Act, 2019	This act ensures comprehensive management and regulation of water resources in the Punjab in the interest of conservation and sustainability.	This this act will be triggered as Main Canal is existed in and around the Project area.
21	Punjab Environmental Protection (Motor Vehicles) Rules, 2013	Subject to the provisions of this act, and the rules and regulations, no person shall operate a motor vehicle from which air pollutants and noise are being emitted in an amount, concentration or level which is in excess of the Punjab Environmental Quality Standards, or where applicable the standards established under clause (g) of subsection (1) of section 6 of the act.	This act will be elicited during construction and operational phase due to use of motor vehicles that produces air pollutants and noise.



Sr. No.	Act	Brief Coverage	Relevance to Project
22	ISO 18001 Occupation Health and Safety Assessment Series (OHSAS)	OHSAS 18001 is an Occupation Health and Safety Assessment Series for health and safety management systems to help organizations to control occupational health and safety risks. The OHSAS specifications are applicable to any institute that desires to establish an OH&S management system to eradicate or reduce risk to employees and other interested parties who may be exposed to the risks allied with the project activities. The construction of the proposed project may involve various health and safety issues to construction labour, therefore these ISO 18001 guidelines will be applicable and pertinent.	This series will be elicited during construction and operational phase to ensure health and safety of workers associated with the project activities.
23	The Punjab Occupational Safety And Health Act, 2019	This Act entails provision of occupational safety and health of the workers at workplace and to protect them against risks arising out of the occupational hazards; to promote safe and healthy working environment catering to the physiological and psychological needs of the employees at workplace.	The Act will trigger during construction and operational phase to ensure health and safety of workers at workplace associated with the project activities.
24	Punjab Restriction on Employment of Children Act, 2016	According to the sub-section 11(a) of this Act, an occupier who employs or permits a child (person under the age of 15 years) to work in an establishment shall be liable to punishment with imprisonment for a term which may extend to six months, but which shall not be less than seven days, and a mandatory fine between 10,000 and 50,000 rupees.	This Act will trigger if contract hire skilled and unskilled labour under age 15.
25	Electricity Act, 1910	The Act provides a legal basis for distribution of Power. It enables a licensee to conduct operations for supply of electricity and binds the license to payment of compensation in respect of any damages caused during the construction, Operation and Maintenance (O&M) of Power distribution facilities.	This act will be applicable if any damages occur during construction of the power facilities.
26	Cutting of Trees (Prohibition) Act, 1975	The Act was enforced in 1975 to place restrictions on cutting of trees in order to restrain unchecked trend of tree felling without replacement plantations.	This act will be applicable to the subject project where the cutting of tree will be involved.
27	The Punjab Protected Areas Act, 2020	The Act provides provisions for the protection, preservation, conservation and management of ecologically important areas such as National parks, Nature reserves, Wildlife sanctuaries, Wilderness areas,	This act will not be triggered as there is no protected area in and around the study area.



Sr. No.	Act	Brief Coverage	Relevance to Project
		Buffer zone, Wetlands, etc.	
28	The Canal and Drainage Act, 1873	The Canal and Drainage Act 1873 (CDA) focuses on construction and maintenance of drainage channels and defines powers to prohibit obstruction or order their removal. It also covers issues related to canal navigation. It briefly addresses issues relating to environmental pollution. Section 70(5) of the CDA clearly states that no one is allowed to "corrupt or foul the water of any canal so as to render it less fit for the purposes for which it is ordinarily used." In addition, Section 73 of the CDA gives power to arrest without warrant or to be taken before the magistrate a person who has wilfully damaged or obstructed the canal or "rendered it less useful."	This act will be applicable as the proposed project is at near premises of the main canal that may get contaminated during construction phase.
29	The Punjab Emergency Service Act, 2006	It deals with the establishment of emergency service for a purpose of maintaining a state of preparedness to deal with emergencies, to provide timely response, rescue and emergency medical treatment to the affected persons and recommending measures to be taken by related organizations to avoid any emergency situation. It describes procedures to establish emergency service, emergency board, emergency fund, emergency ambulance and rescue vehicles, offence and punishment, etc.	This act is applicable to the proposed project to provide timely response, rescue and emergency medical treatment to the affected persons during construction and operation phase of project.
30	National Disaster Management Act, 2010	National Disaster Management Act, 2010 was passed by Parliament of Pakistan in 2010. The Act applies to whole Pakistan. The Act was passed in backdrop of 2010 Floods in Pakistan and strengthens Disaster Management system.	This act is applicable to the proposed project. The proposed project will require special consideration to disasters and risk management strategies as per the Act.
31	Hazardous Substance Rule, 2003	The rule describes the procedure of handling, transportation and disposal of hazardous substances and hazardous waste. Inter alia, general safety precautions for handling hazardous substances as well as safety precautions for workers, and notification requirements in the event of an accident are described in these rules. Requirements for project waste management plans are also defined. These include a requirement for updating the plan every three years, the need to provide for	This rule is applicable to the proposed project due to involvement of hazardous waste handling, use and disposal during the construction stage.



Sr. No.	Act	Brief Coverage	Relevance to Project
		management of hazardous waste in a manner that will prevent adverse environmental impacts and to ensure that hazardous and non-hazardous waste are not mixed.	
32	Building Code of Pakistan, 2007	The provision of Building Code of Pakistan shall apply for engineering design of building like structure and related components. The construction in violation of the Building code shall be deemed as violation of professional engineering work. Moreover, a certificate for the proposed action will be obtained from Provincial Building Control Authority.	These codes shall be used in structural design of building area components constructed under this proposed project.
33	Seismic Building Code of Pakistan 2007	This code stipulates the minimum requirements for seismic safety of building and structures and the provisions of the Building Code of Pakistan (Seismic Provisions-2007) shall apply for engineering design of buildings, like structures and related components. Construction of buildings shall be considered as violation of professional engineering work specified under clause (XXV) of section 2 of the Act.	This Code is applicable to the proposed project as it includes the formation of structures.
34	LDA Landuse Rules 2020	These Rules describes the procedures for permitted and permissible use of residential, commercial, industrial, institutional areas, Land Use Classification, Re-Classification, Re-Development Plan and provide lists of segments permitted for future commercial use, etc.	These rules shall be used to classify the landuse of the CBD, its future use, etc.
36	LDA Building and Zoning Regulations 2019	The Regulations provides specifications for establishment of Built Up Areas in Approved Schemes, site requirements for commercial & public buildings and requirements for development of Central Business District i.e. construction of Main Civic and Commercial Centers & Neighborhood Commercial Areas, Parking, structural design of multi storey buildings, fire safety plan. it also describes roles and responsibilities of builder, consultant, Contractor, Authority and requirements of necessary NOCs from concerned agencies i.e. EPA, TEPA, etc.	These regulations are applicable to the proposed project as it defines the specifications for establishment of Central Business District.
37	Lahore CBD Development Authority	The Ordinance defines procedures for Establishment of the Authority, Powers and Functions of	The Ordinance is directly related to the establishment of proposed CBD and any



Sr. No.	Act	Brief Coverage	Relevance to Project
	Ordinance 2021	<p>the Authority, Establishment of housing schemes, projects, modification of Land use of any area, Acquisition of land and relevant Compensation, etc.</p> <p>The ordinance also describes the offences of Discharging any dangerous chemical, inflammable, hazardous or offensive article in any drain, or sewer, public water course or public land vested in, as causes or is likely to cause danger to persons passing by or living or working in neighborhood, or risk or injury to property or causing harm to the environment and related penalties.</p>	constraint and nuisance caused due to construction activities.

2.3 INTERNATIONAL PROTOCOL / CONVENTIONS

As Pakistan is a member of a number of international organizations such as United Nations Organization (UNO), Organization of the Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC), Economic Cooperation Organization (ECO) etc., so it has to follow the international protocols and obligations related to the environment. The major protocols, ratification dates by Pakistan and obligations related to the proposed project are provided in the **Table 2.3** below:

Table 2.3: International Agreements/Conventions Relevant to the Project

Sr. No	Agreement/Convention	Ratification	Description/Relevance
1.	<p>UNESCO Convention on the Protection of the World's Cultural and Natural Heritage, 1972</p> <p>Web Link: http://whc.unesco.org/en/%20convention%20text/</p>	<p>Pakistan ratified this convention on 23 July 1976.</p>	<p>Convention concerning the Protection of the World Cultural and Natural Heritage - requires parties to adopt a general policy on the protection of the natural and cultural heritage, to set up services for such protection, to develop scientific and technical studies, to take appropriate legal, technical, scientific and administrative measures and to foster training and education for such protection.</p>
2.	<p>The Rio Declaration, 1992</p> <p>Web Link: http://www.unesco.org/education/pdf/RIO_E.PDF</p>	<p>Pakistan signed the treaty on 13 Jun 1992 and ratified on 1 June 1994</p>	<p>The Rio Declaration comprises 27 principles which address important issues such as; sustainable development to integrate environmental protection into the development process; common but differentiated responsibilities to conserve, protect and restore the earth's ecosystems; public participation and information access at the national level, reduce and eliminate unsustainable patterns of production and consumption.</p>



Sr. No	Agreement/Convention	Ratification	Description/Relevance
3.	Kyoto Protocol, 1992 Web Link: https://unfccc.int/kyoto_protocol	Pakistan has ratified Kyoto Protocol in 2005	<p>The Kyoto Protocol is a protocol to reduce Greenhouse gasses that cause climate change. It was agreed on 11th December, 1997 at the 3rd Conference of the countries to the treaty when they met in Kyoto, and entered into force on 16th February, 2005. As of November 2007, 175 countries have ratified the protocol.</p> <p>One hundred and thirty-seven (137) developing countries have ratified the protocol, including Brazil, China, India and Pakistan but have no obligation beyond monitoring and reporting emissions.</p>
4.	Convention on Biological Diversity, 1994 Web Link: https://www.cbd.int/	Pakistan signed this treaty in 1992 and it was ratified by cabinet in 1994.	The Convention on the Biological Diversity has three main goals: Conservation of biological diversity (or biodiversity); sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources.
5.	UN Convention to Combat Desertification (UNCCD), 1994 Web Link: https://www.unccd.int/	Pakistan signed the Convention on 15th October 1994 and ratified it on 24 February, 1997	The UNCCD is a Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.
6.	Stockholm Convention on Persistent Organic Pollutants (POPs), 2004 Web Link: https://www.un.org/press/en/2004/unep204.doc.htm	<p>The Stockholm Convention on Persistent Organic Pollutants was signed on 22 May 2001 and entered in to force on 17 May, 2004.</p> <p>Pakistan signed the convention on December 6, 2001</p>	Convention seeks to protect human health and the environment from POPs as set out in Article-1, which are chemicals that remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife.
7.	Paris Agreement, 2015	The Paris Agreement's central goal is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below two degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even	The implementation of the proposed project will reduce the emission of greenhouse gases (GHG) due to the construction of the proposed project.



Sr. No	Agreement/Convention	Ratification	Description/Relevance
		further to one and half degrees Celsius. Additionally, the agreement aims to increase the ability of countries to deal with the impacts of climate change, and at making finance flows consistent with a low GHG emissions and climate-resilient pathway.	
8.	Sustainable Development Goals (SDGs)	<p>At the Sustainable Development Summit on 25th September 2015, UN Member States adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 SDGs to end poverty, fight inequality and injustice, and tackle climate change by 2030.</p> <p>Pakistan has displayed commendable commitment to the 2030 Agenda for Sustainable Development as it was one of the first countries to endorse it globally in 2015. On 16th February 2016, the Parliament unanimously approved the SDGs as the national development agenda.</p>	<p>The SDGs that will prevail for the proposed project are as follows:</p> <ul style="list-style-type: none"> • Promote Gender Equality and Empower Women: The contractor during construction phase will be responsible to hire women for construction activities to elude gender discrimination and to promote women empowerment. • Combat HIV/AIDS Malaria and Other Diseases: Contractor will be responsible to conduct medical surveillance of the workers before hiring to combat HIV/AIDS Malaria and other diseases. • Ensure Environmental Sustainability: Contractor will be responsible to ensure environmental sustainability of the proposed Project Areas by ensuring implementation of EMP to mitigate adverse environmental impacts from construction activities during construction phase.

2.4 ADMINISTRATIVE FRAMEWORK

2.4.1 Punjab CBD Development Authority

Punjab CBD Development Authority is responsible for ensuring that the project complies with the laws and regulations and mitigations measures suggested in EIA of the proposed project for controlling the environmental and social concerns of during pre-construction, construction and operation phase, and all pre-construction requisites, such as permits and clearances are met.



2.4.2 Environmental Protection Agency, Punjab

Pakistan Environmental Protection Agency is meant for the enforcement of environmental laws in Pakistan. They have delegated powers to provincial environmental protection agencies for review, approval and monitoring of environmental examination/assessment projects. As the proposed Project also falls in Lahore District therefore Punjab-EPA will be responsible for reviewing the report, issuing environmental approval and overall/broad based monitoring of the proposed project activities.



3 DESCRIPTION OF THE PROJECT

3.1 GENERAL

This Chapter presents the detailed project description along with project cost, land acquisition, implementation schedule, workforce and water requirements, etc.

3.2 OBJECTIVES OF THE PROJECT

The main objectives of the proposed Project are:

- Signal free access from Bhekewal Morr to Kalma Chowk;
- Signal free access from Jinnah Hospital to Kalma Chowk;
- Reducing traffic congestion, time delays and transportation cost by diverting traffic load; and
- Provide a safe, congestion free road facility to the commuters of the Project area.

3.3 PROJECT DESCRIPTION

3.3.1 Project Administrative Jurisdiction

The proposed Project lies in the Lahore city, Punjab.

3.3.2 Project Implementation Schedule

The tentative implementation period for proposed Project is One (01) year.

3.3.3 Cost of the Project

Tentative cost of the proposed Project (Remodeling of Walton Road) is about PKRs. 6285.01 Million.

3.3.4 Salient Features of the Project

The proposed Project aims Signal Free Corridor from Bhekewal More to Kalma Chowk and from Jinnah Hospital to Kalma Chowk for smooth traffic flow.

Salient features of the proposed Project as provided below:

- At-Grade Separation at Barakat Market Chowk;
- At Grade Improvement at Campus Bridge;
- construction of the underpass from Barket Market to Canal Road;
- Construction of underpass Jinnah Hospital to Kalma Chowk ;

Component Map of the proposed project is given as **Figure 3.1**.



3.3.5 Design Aspect

Following is the brief description of the design aspects of the proposed project. This information is based on the preliminary design data as the detailed design is under process. This information will be updated once the detailed design is completed and PC-1 is approved from the concerned authority.

3.3.6 Design Features

The geometric design will be carried out as per “A Policy on Geometric Design of Highways and Streets 2011” by AASHTO based on the following main parameters.

PARAMETER	DESIGN
Speed	40 KPH
Underpass	2 NO.
No. Of Lanes	2
Shoulders	3 FT
Super elevation	4%
Up Ramp Slope	4%
Down Ramp Slope	4%
Length	700 M & 1400 M
Clearance	5.3 M
Str. Type	R.C.C
At Grade U Turns	4 NO.

3.3.7 Codes and Standards

The following codes and standards have been considered and adopted for the design of the project road:

- Geometric Design: AASHTO
- Material & Testing: AASHTO – ASTM
- Pavement Design: AASHTO



Figure 3-1: Component Map of the Proposed Project



3.4 CONSTRUCTION MATERIAL

The materials used in construction of the proposed project would include following but not limited to: cement, sand, aggregates, stones, reinforced cement concrete frame (RCC Frame), brick infill, brick cladding coarse aggregates (crush), fine aggregates (sand), water, asphalt, reinforcement cement and steel.

- a) Crushed Aggregate of required specifications will be utilized by the contractor from available sources nearby the project area.
- b) Good quality natural fine aggregate or sand of acceptable gradation will be obtained from nearby licensed or approved entities dealing with fine aggregates.
- c) Asphalt, reinforcement and cement material will be transported from the nearby factories or approved dealers for construction purposes.

3.5 EXPECTED EQUIPMENT'S FOR CONSTRUCTION

The list of the machinery and the equipment expected to be used for the proposed Project are provided in **Table 3.1**.

Table 3.1: Machinery and Equipment Requirement for the Proposed Project

Sr. No.	Machinery Name	Sr. No.	Machinery Name
1	Dump Truck	12	Self-Propelled Pneumatic Roller
2	Front End Loader	13	Asphalt Distributor
3	Dozer	14	Batching Plant
4	Grader	15	Concrete Transit Truck
5	Vibratory Roller	16	Concrete Pump
6	Water Tankers	17	Excavator
7	Aggregate Spreader	18	Water Pumps
8	Three Wheel Rollers	19	Cranes
9	Tandem Roller	20	Vibrators
10	Asphalt Plant	21	Generators
11	Paver		

3.6 CONSTRUCTION CAMPS

Construction camps for the proposed Project components will be located within the premises of proposed Project.

However, if construction camp is to be located outside the project boundary, following criteria shall be adopted by the Contractor to identify and for the establishment of the construction camp sites before start of the construction:

- There should be no or minimum resettlement issues for the location of the camps;
- Camp site should be away from the residential areas and sensitive receptors;
- Selection of sites for construction camps shall be near the project area having proper access to the nearby main/link road;



- The camps must be located in a place where the drainage from and through the camps will not threaten any domestic or public water supply;
- Camp site must be adequate in size to prevent overcrowding of necessary structures;
- The camp site should consider avoiding any damage of property, vegetation, irrigation, and drinking water supply systems;
- The camp site must not be subject to periodic flooding; and
- There should not be any ecological sensitive areas e.g. wildlife sanctuaries, game reserves, national parks, forest areas, etc. near to the construction camp site.

3.7 WORKFORCE REQUIREMENTS

Manpower demand estimation is an essential component to facilitate deployment of manpower. Tentative workforce required for proposed Project during construction phase will be about 100 workers/employees. Unskilled labor should be hired locally.

3.8 SOURCE OF WATER

Contractor will be responsible to arrange water for construction works. However, it is supposed that water bowsers will be used by the contractor on the site for construction activities. The source of water during the operation phase for the proposed Project will be the tube wells installed inside the project boundary.

3.9 WATER REQUIREMENT

The source of water during the construction phase will be from water bowser tanks and groundwater (if available) from local sources will be used. The water consumption is estimated to be 4,000 liters /day¹ for 100 construction workers labor (approx.) for the proposed Project.

3.10 WASTEWATER GENERATION AND TREATMENT MECHANISM

The wastewater generation is estimated to be 3,200 liters/day for 100 labor (approx.) for the proposed Project.

3.11 SOLID WASTE

Due to construction activities, waste will be generated at construction site and contractor's camp. The contractor will provide the estimated quantity of excavation material during the construction phase. These wastes will be generated due to the construction activities and up to the extent possible the excavated materials will be reused, where applicable, for construction purposes. Solid waste generated during construction and camp sites shall be safely disposed at demarcated waste disposal sites.

1. Tentative Work Force Requirements Including Client and Contractor Staff"
= (100) x (40) = 4,000 liters/day
= (100) x (80% of wastewater) =3,200 liters/day



The solid waste generation is estimated to be 50 kg/day (as per 0.5 kg/capita/day waste generation)² for 100 construction workers for the proposed Project.

2. Source: The World Bank Report 2012 – What a Waste: A global review of solid waste management. Based on UNEP estimates for waste generation in the Asia Pacific. Average is 0.45 kg/capita/day

4 DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

For any development project, the prevailing environmental conditions need to be assessed prior to the stages of planning, designing and execution of the project. Identification of physical, ecological and social aspects of environment and collection of relevant data is essentially important for the evaluation of impacts as well as for the suggestion of adequate mitigation measures, which forms the basis for the implementation of the proposed Project in terms of prevailing environmental and social conditions in the study area.

The existing environmental conditions of the proposed Project have been considered within the COI (taken 25 m from Project boundary) with respect to physical, biological and socio-economic aspects. The Study Area is selected on the basis of the Project's potential environmental and social impacts on the local resources. Information has been collected from variety of sources, including published literature, DCRs, field observations and surveys, conducted specifically for this Project have been analyzed for this study. Consultations were also held with the general public and stakeholders of the Project area in order to seek the public opinion on the implementation of the proposed Project.

4.2 PHYSICAL RESOURCES

The following section provides an overview of the information on physical environment of the proposed Project study area collected from primary as well as secondary sources. The major parameters covered include Physiographic and Topography, Geology, Soil, Seismicity, Climate and Meteorology, Ambient Air & Noise, Water Resources, Solid Waste, and Land Use.

4.2.1 Topography

Lahore is generally flat and slopes towards south and south-west at an average gradient of 1:3000. The general height varies from 150 to 200 meters above the mean sea level (MSL). It is divided into two parts i.e. the low-lying area along River Ravi and the comparatively upland area in the east, away from Ravi. The low lands are generally inundated by the river water during intense rainfall events.

The Project site is located within an alluvial plain, naturally flat and level having no hills and valleys. The topography map of the Project area is attached as **Figure 4.1**.

4.2.2 Geology

Lahore city lies on the alluvial plain called Bari Doab³. Doab is a local word for area between rivers. Bari Doab is a part of the Indo-Gangatic alluvial plain formed by the Indus River and its tributaries. It is bounded by Ravi and Chenab rivers in the northwest and west, and Sutlej

³ Kadwai, S.U. and Siraj, A. (1964), "The Geology of Bari Doab, West Pakistan", WAPDA Water and Soil Investigation Division (Bulletin No. 8)

River in the Southeast. A northeastern boundary of Doab lies near the foothills of the Himalayan Ranges.

The Bari Doab is covered by quaternary alluvium, which overlies semi-consolidated tertiary rocks or metamorphic and igneous rocks of Precambrian age. Except for a small area in the northeastern part of Doab where basement rock was encountered no information is available at present regarding the distribution of tertiary and Precambrian rocks in the Doab.

The thickness of alluvial deposits in Lahore reported to be more than 300 meter. These alluvial deposits are underlain by the basement rocks of the Indian shield. The alluvial deposits mainly consist of sands, with intercalation of silt and clay layers of varying thickness. Project site is located in meander belt deposits.

The Project area does not have any valuable minerals. Although, scientific in depth, investigations haven't been carried out, yet the surveys conducted have failed to discover any minerals worth the name till to-date.

The only minerals worth to value are kallar and kankar⁴ in the district Lahore. Kallar is the grey powdery substance collected and taken out from the old village sites and other deserted abodes in the district. It is used for the manufacture of crude saltpeter and also as manure for the top dressing of young cotton and tobacco plants (no longer in the line of extensive cultivation). With the passage of time the demand for Kallar diminished and its use as a trading commodity is on the decline. Kankar is used for metaling Roads and its smaller particulars are burnt for lime. It is a kind of limestone gravel and is found, after being dug out at a depth varying from one to eight feet, in many parts of the district particularly the uplands. However, the Project area does not have any valuable minerals. The geological map of the Project area is attached as **Figure 4.2**.

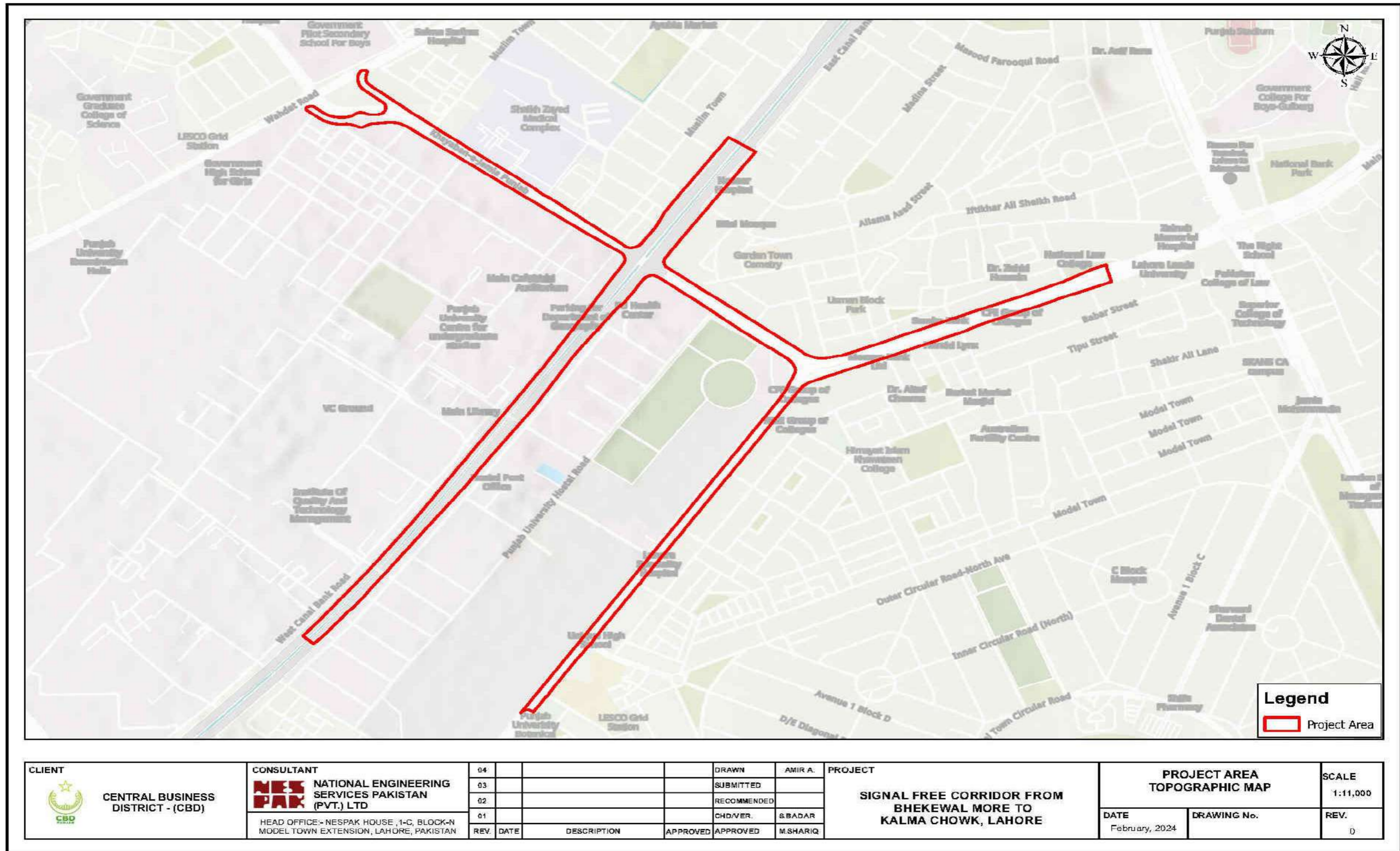
4.2.3 Soil

The soil in the Project area is cohesion less and is of alluvial type deposited by Ravi River. The types of soil layers that are present below the ground level includes: silt, silty clay, silty sand, poorly graded sand with silt and lean clay. The soil map of the Project area is attached as **Figure 4.3**.

4.2.4 Seismology

The Project site falls in the Punjab plain, which has low to moderate level of seismicity. The Project region has been subjected to severe shaking in the past due to earthquakes in the Himalayas. The known main active fault of the Himalayas is the Main Boundary Thrust (MBT). The epicenters of low to moderate magnitude earthquakes, recorded in the Punjab plain are associated with the subsurface fractures in the basement rocks, which are concealed by thick alluvial deposits.

⁴ Malik, A. (2015). Geotechnical statistical evaluation of Lahore Site Data and Deep Excavation Design



CLIENT CENTRAL BUSINESS DISTRICT - (CBD)	CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	AMIR A.	PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE	PROJECT AREA TOPOGRAPHIC MAP		SCALE	
		03				SUBMITTED						1:11,000
		02				RECOMMENDED						
		01				CHD/VER.	S.BADAR					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ		DATE	DRAWING No.	REV.	
									February, 2024		0	

Figure 4-1: Topography Map of the Study Area

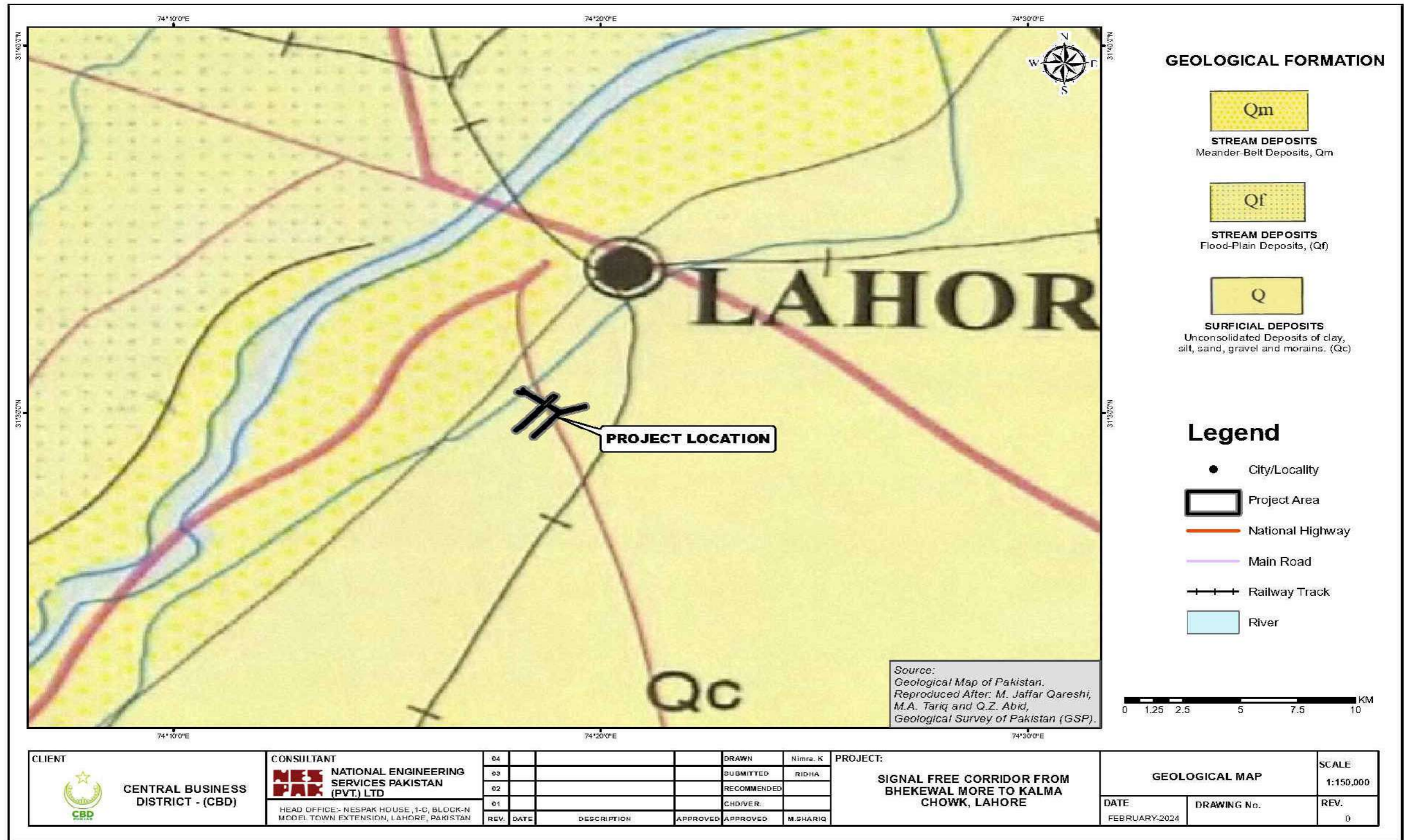


Figure 4-2: Geological Map of the Study Area

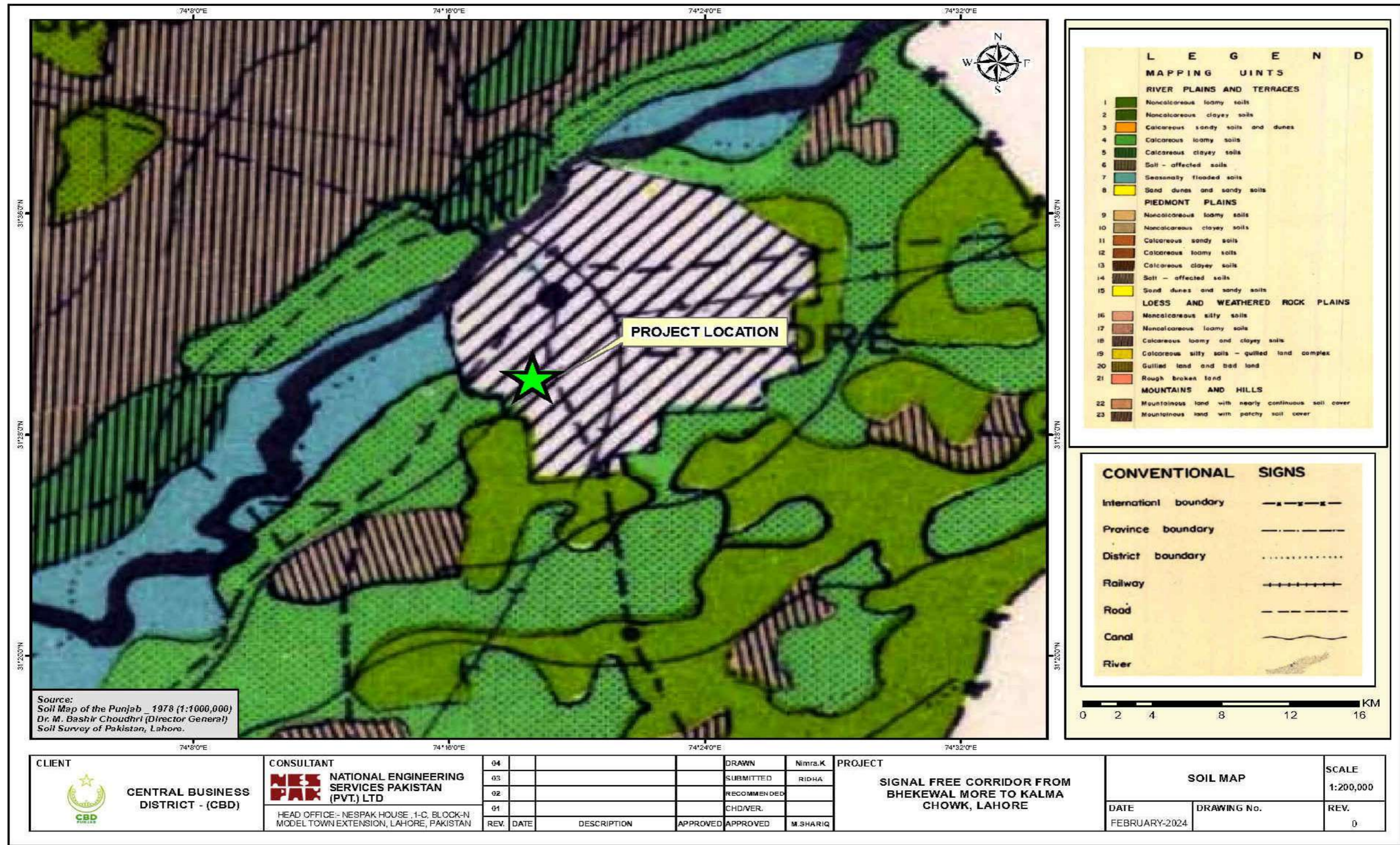


Figure 4-3: Soil Map of the Study Area

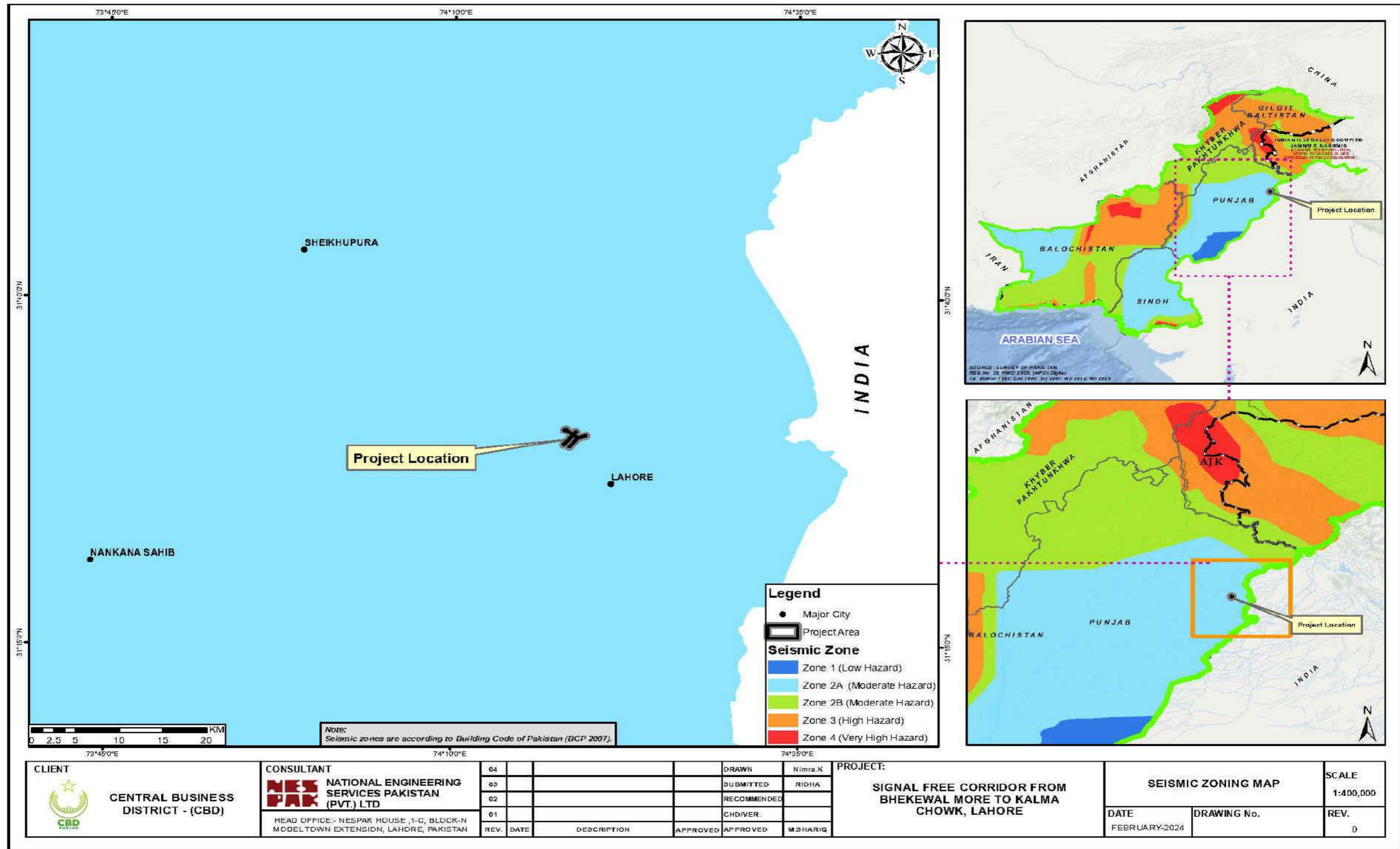


Figure 4-4: Seismology Map of the Study Area

According to Building code of Pakistan 2007, the Project area falls in Seismic Zone 2A of Pakistan (low to moderate damage) with peak ground acceleration (PGA) from 0.08 to 0.16 g. The seismology map of the Project area is shown above in **Figure 4.4**.

4.2.5 Climate and Meteorology

The seasonal climatic conditions must be considered for the design and execution of the developmental projects. The climate including air, temperature, precipitation, humidity and evaporation are an influencing factor, affecting the construction of engineering structures. However, to determine the overall effect of the climatic stresses, daily and seasonal temperature changes, site altitude, direct solar radiation, and precipitation must be considered.

The Project area has moderate to extreme climate conditions, with hot summers and cold winters. The summer starts from April and lasts till September, with mean minimum and maximum temperature ranges from 27°C to 47°C. The winter seasons lasts from November to March, with mean minimum and mean maximum temperature ranges from 2°C to 18°C.⁵

The Project area receives rains in all the seasons but monsoon rain is pronounced and constitutes a definite rainy season between the month of July and September. The average rainfall is about 1,172 mm per year.

Based on climatic elements, following five seasons are recognized in the Project area i.e.:

Pre-monsoon Season: Pre-monsoon refers to the period from April to June prior to the setting in of the monsoon. This is the hottest and the driest season, with persistent dry and hot winds. Day time temperature rises to 47°C. The flows in the rivers begin to rise simultaneously due to snow-melt water in the high mountains. The water table falls to the maximum depth.

Monsoon Season: Monsoon is the main rainy period, which starts at the beginning of July, reaches its climax in August and gradually, subsides in September. The intense rainfall events cause soil erosion, which is a function of erosivity and erodibility. The cool monsoon winds followed by heavy showers lower the temperature to great extent. The part of rain percolates into the soil and is conserved in the subsoil, and adds to the groundwater. The conserved moisture in the soils is generally sufficient to rejuvenate the vegetation. All plants grow rapidly and mature towards the end of the season. With the start of monsoon season, the rivers flow at their peak level. The groundwater level is improved toward the end of the season in September and October.

Post-Monsoon Season: Post monsoon season refers to autumn (October-November). The temperature starts falling but the extreme aridity prevents plants to flower early and set seed toward mid-seasons. Groundwater level rises as a result of infiltration from rainfall.

⁵Meteorological Data for Lahore (1981-2010), Pakistan Meteorological Department.

Winter Season: Winter refers to the period from December to January. The lowest temperature is less than 2°C, and cold winds characterize this season. The plants become dormant and most of them dry out. Most of the trees shed their leaves and few remain green or partly green. Sometimes this season becomes severe due to cold Siberian winds. Groundwater level declines in this season due to low flows in the rivers, and no or little rains, which usually fall in light showers causing little soil erosion.

Spring Season: Spring refers to the period from February to March. Temperatures become pleasant. The mean maximum temperature is 24.5°C. Some light showers of rain may also fall without generating run off. The vegetation sprouts again because of conserved moisture from winter and spring rains (if any), and the water table starts falling.

Temperature, precipitation, relative humidity, evaporation, wind speed and wind direction of the study area (District Lahore) is discussed below.

4.2.5.1 Temperature

Table 4.1 and 4.2 shows mean minimal and maximal temperatures observed for each month between year 2010 to 2020 in the study area. The highest temperature measured is 47°C in June, 2014, and the lowest temperature was observed in December, 2020 i.e. 7°C.

Table 4.1: Mean Maximum Temperatures (°C) between 2010 and 2020⁶

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2010	24	25	36	42	45	46	42	28	37	36	31	25
2011	22	23	31	37	44	44	40	36	35	34	30	25
2012	19	20	29	35	42	46	45	38	37	36	30	24
2013	22	22	31	37	44	46	43	38	40	36	29	25
2014	22	23	28	36	41	47	44	42	36	35	29	22
2015	22	26	28	6	43	42	39	39	38	36	30	24
2016	24	28	31	37	43	45	41	40	40	39	32	28
2017	21	27	31	40	44	43	41	41	41	39	30	26
2018	25	27	33	38	43	44	40	40	39	36	30	24
2019	20	22	27	38	41	45	41	39	39	36	28	22
2020	18	25	27	36	41	45	44	40	41	38	28	23

Table 4.2: Mean Minimal Temperatures (°C) between 2010 and 2020⁷

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2010	9	11	18	24	28	30	30	28	25	23	17	11
2011	8	10	15	20	29	32	31	27	26	23	19	13
2012	7	8	14	22	28	33	33	29	26	23	18	13
2013	9	11	15	22	30	34	33	28	27	25	17	13
2014	9	9	14	22	28	34	32	3	26	23	17	10

⁶ Meteorological Data for Lahore (2010-2020)

⁷ Meteorological Data for Lahore (2010-2020) - <https://www.worldweatheronline.com/gujrat-weather-averages/punjab/pk.aspx>

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2015	9	12	15	23	30	33	31	30	26	25	18	13
2016	10	12	16	23	31	34	32	30	28	24	18	14
2017	9	11	15	24	30	32	32	31	29	26	20	16
2018	13	14	19	25	31	35	32	31	28	25	20	14
2019	11	12	16	26	30	34	31	29	27	24	19	13
2020	10	13	16	24	30	35	34	31	30	26	18	14

Figure 4.5 shows the graphical presentation of mean temperatures in the Study Area for the year 2010-2020.

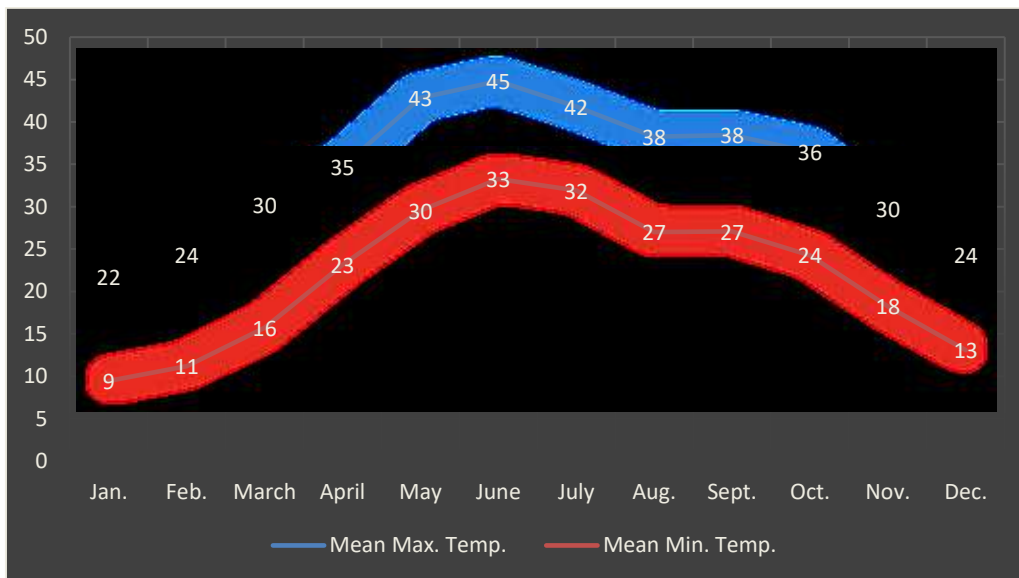


Figure 4-5: Mean Maximum and Minimum Temperature in the Study Area (2010-2020)

4.2.5.2 Precipitation (Rainfall)

Table 4.3 shows mean monthly precipitation observed in the study area from 2010 to 2020 with an annual average rainfall of 409.2 mm. Figure 4.6 shows the mean monthly precipitation in the study area for the year 2010-2020.

Table 4.3: Mean Monthly Precipitation (2010-2020)⁸

Month	Precipitation (mm)
January	19.7
February	31.2
March	28.3
April	18.5
May	21.6
June	42.7
July	70.2
August	83.2

⁸ Meteorological Data for Lahore (2010-2020)

Month	Precipitation (mm)
September	77.9
October	3.8
November	5.2
December	6.9
Annual	409.2

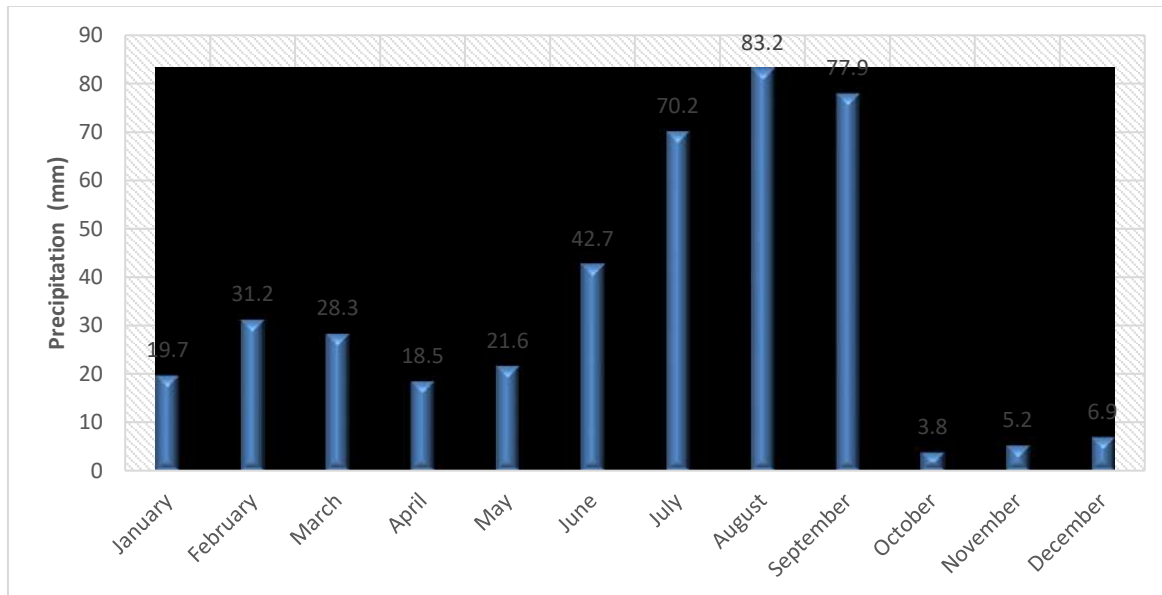


Figure 4-6: Average Precipitation in the Study Area (2010-2020)

4.2.5.3 Relative Humidity

A mean daily data of humidity on a monthly basis from 2010 to 2020 is shown in **Table 4.4** and **Figure 4.7**.

Table 4.4: Mean Relative Humidity (%) in the Study Area (2010-2020)⁹

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2010	49	53	40	20	18	20	44	63	61	44	28	32
2011	50	64	49	34	25	34	47	68	68	41	36	32
2012	59	59	51	39	20	17	35	58	54	32	27	40
2013	47	68	52	26	16	25	38	59	45	39	27	36
2014	51	61	52	31	24	20	34	40	58	38	27	33
2015	48	47	53	33	16	24	44	49	39	30	26	29
2016	43	37	42	23	21	25	42	44	35	21	19	27
2017	53	45	36	21	20	29	40	39	30	18	24	27
2018	32	38	30	25	17	28	43	47	45	25	25	27
2019	45	63	51	27	19	20	46	54	51	34	41	39
2020	59	47	57	33	24	22	34	53	38	16	24	35

⁹ Meteorological Data for Lahore (2010-2020)

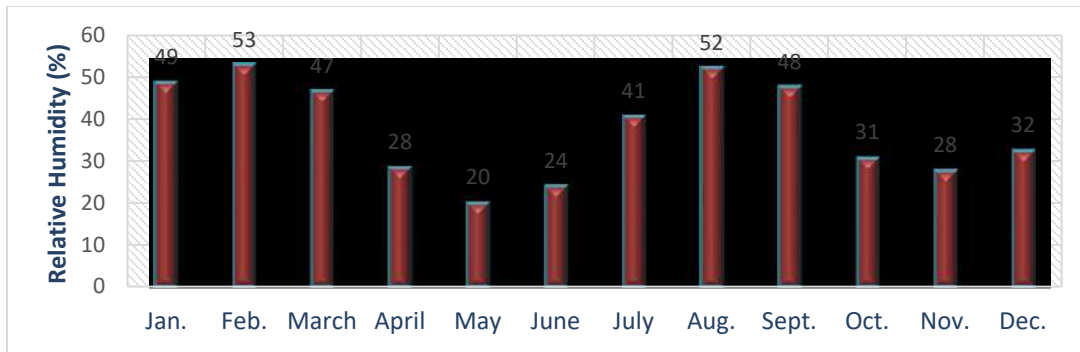


Figure 4-7: Mean Relative Humidity in the Study Area (2010-2020)

4.2.5.4 Wind Speed and Wind Gust

Table 4.5 and Figure 4.8 depicts average wind speed on a monthly basis in the study area from year 2010 to 2020.

Table 4.5: Mean Wind Speed (Km/h) in the Study Area (2010-2020)¹⁰

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2010	7	8.5	7.5	8.4	8.7	7	8	6.4	5.7	5.3	6.6	6.7
2011	7.2	8.3	8.2	8.3	8.2	8.4	6.8	6.9	5.1	5.6	6.1	6.3
2012	7.3	9.5	8.9	8	8.6	7.2	6.8	6.4	5.4	5.5	7	8.4
2013	7.4	9.2	8	8.4	8.6	7	7.3	6.6	5.4	5.1	7.4	7.4
2014	7.4	7.3	8.8	8.9	7.8	7.5	6.6	5.8	5.6	5.8	7.6	7
2015	7.3	9.5	8.7	9.7	9.2	8.9	9.8	8.2	7.3	6.7	7.6	7.4
2016	6.5	8.2	9.9	10.9	10.3	9.4	7.7	6.8	7	5.6	6.9	6.3
2017	7.4	8.1	8.1	10.3	8.6	8.7	7.9	7.4	5.3	5	4.7	6.2
2018	5.9	6.9	7.9	9.2	10	9.4	8.3	8.5	7.5	5.8	6.9	5.2
2019	6.6	7.2	8.1	9.3	9.2	10.3	11.9	9.9	11.4	7.5	6.9	4.9
2020	6.7	7.7	9.8	9.8	11.8	10.6	9.9	10.3	7.4	6.1	7	7.1

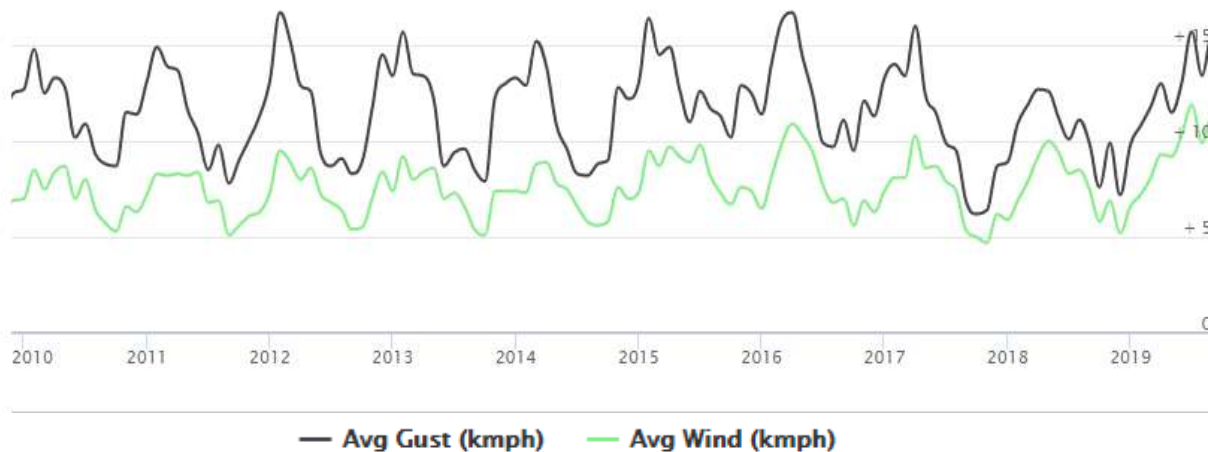


Figure 4-8: Average Wind Speed and Gust in the Study Area from 2010 to 2020

¹⁰ Meteorological Data for Lahore (2010-2020)

4.2.6 Ground Water

Presently main clean water source in Lahore is ground water that meets all the requirements including domestic, industrial and commercial, which is being extracted through tube wells installed in the city at about 600 ft. depth.

Water and Sanitation Agency (WASA) is the competent authority for the planning, designing, development and maintenance of water supply, sewerage and drainage system in the study area. WASA is responsible for:

- Rehabilitation and augmentation of the existing system.
- Operation and maintenance of water supply, sewerage & drainage system.
- Undertaking bulk production, filtration/treatment, transmission and retail distribution of purifying water.
- Collection, pumping, treatment & disposal of sewage & industrial waste.
- Enforcement against defaulters and unauthorized connections etc.
- Short term and long-term planning for tapping additional water sources & its implementation to meet water supply and sewerage demand projected.

WASA Lahore maintains a wide network of about 3,200 Km pipelines for water supply providing water to the residents of Lahore city including Project Area. WASA have installed 316 tubewells in the city for provision of pure and hygienic water to the residents. Average daily water supply to the Lahore city is about 329 MGD through 610,000 water connections.¹¹

4.2.7 Surface Water Hydrology

The main surface water resources in the Lahore city are Ravi River, Lahore Branch Canal, Khaira Distributary and the Bambawali Ravi Bedian Depalpur (BRBD) canal.

4.2.7.1 Ravi River

The Ravi River is a trans-boundary river crossing north western India and eastern Pakistan. It is one of six rivers of the Indus system in Punjab region. The Ravi River having a total length of about 720 kilometers flows across the city of Lahore. However, besides monsoon season the river is mostly dry due to the fact that water is diverted in India for irrigation and domestic purposes. In the past, River Ravi was the main source for recharge of groundwater aquifer, but due to increasing water demand and diversion of its water in India, it can no longer meet the required aquifer recharge of Lahore city. The quality of water of Ravi River has a direct impact on quality of water present in the adjacent aquifer.

¹¹ https://wasa.punjab.gov.pk/infodesk_watersupply

4.2.7.2 BRBD Canal

BRBD canal flows in the east of Lahore, from North to South. It crosses Grand Trunk Road, at a distance of about 6 kilometers, from Lahore Ring Road. The Canal takes off from Upper Chenab Canal (UCC) at Bambanwala, itself off takes from Marala Barrage with full discharge. The BRBD is about 175-kilometers long. It is an earthen channel except a short lined central segment. Although design capacity at head is 7,260 cusecs, the maximum discharge is around 4,600 cusecs. Among others, one of the reasons of limiting discharge to 4,600 cusecs is the limited design capacity of Syphon for crossing of River Ravi. The Canal is brick lined from RD 260 to RD 373 and crosses the River Ravi and GT road at RDs 281 and 325¹² respectively.

4.2.7.3 Lahore Branch Canal

The other surface water source is the Lahore Branch Canal (LBC), which takes off from BRBD canal at about RD 230. It is an open channel with lining at both sides. Due to its limited discharge of about 400 cusecs, this canal cannot be considered as surface water source for Lahore, even to draw 100 cusec discharge.

4.2.8 Drainage

There are total eight (08) major drains in the Lahore city i.e. Sattu Kattla drain, Lakshami Drain, Suk Nehar Drain, Upper Chota Ravi Drain, Lower Chota Ravi Drain, Siddique Pura Drain, Cantonment Drain and Shahdara Drain along with 76 minor drains which finally fall into aforementioned major drains. At present, all these drains collect wastewater from different areas of Lahore and finally fall into River Ravi and greatly deteriorated the quality of river water.

The nearest drain close to the Project area is the Ferozepur drains in which minor drains of the Project area falls.

The surface water resources map of the study area is shown in **Figure 4.9**.

4.2.9 Solid Waste

Lahore Waste Management Company (LWMC) is responsible to ensure efficient collection, transportation, recovery, treatment and disposal of solid waste generated in the study area. LWMC renders following sanitation services throughout the Lahore city including study area:

- Collection of waste by placement of containers & bins and through door to door collection;
- Collection and removal of waste to the approved disposal sites;
- Manual / Mechanical sweeping of main and arterial roads, streets and squares with vacuumed vehicles; and

¹² Final Feasibility Study Report on Lahore Water and Wastewater Management Project-February, 2019

- Mechanical washing.

LWMC has placed waste storage containers at different points in the study area, waste collected by pickup from these containers and unloaded into nearby compactor or transfer station.

4.3 ENVIRONMENTAL MONITORING

The environmental monitoring of parameters like ambient air quality, noise level, surface water and groundwater help us to analyze the prevailing environment conditions in and around the study area, and to protect it from any adverse activities due to the proposed Project implementation.

The environmental monitoring for ambient air, noise level, surface water and groundwater for establishing the baseline profile of the Study Area is in progress.

4.4 LAND USE PATTERN

The land use of the study area is mainly a barren land and built-up area. The built-up area primarily includes shops, mosques, offices, health, and educational institutes. A considerable area is covered with trees and shrubs. The land use index map is attached as **Figure 4.10**, whereas detailed land use map is attached as **Annexure-I**.

4.5 ENVIRONMENTAL SENSITIVE RECEPTORS

Sensitive receptors are mainly people or other organisms that may have a significantly increased sensitivity and exposure to the pollutants and social disturbance, due to the developmental projects. Thus, sensitive receptors are necessary to be identified, to evaluate the potential impacts of the proposed Project on public health and the surrounding environment.

The sensitive receptors identified for the proposed project within COI are: health and educational institutions, wedding marquees and religious places (mosques and graveyard). They are prone to sensitivity during construction phase, due to emission of air pollutants, noise and vibration, temporary edifice of construction camps and mobilization issues.

The sensitive receptor map is attached as **Figure 4.11**

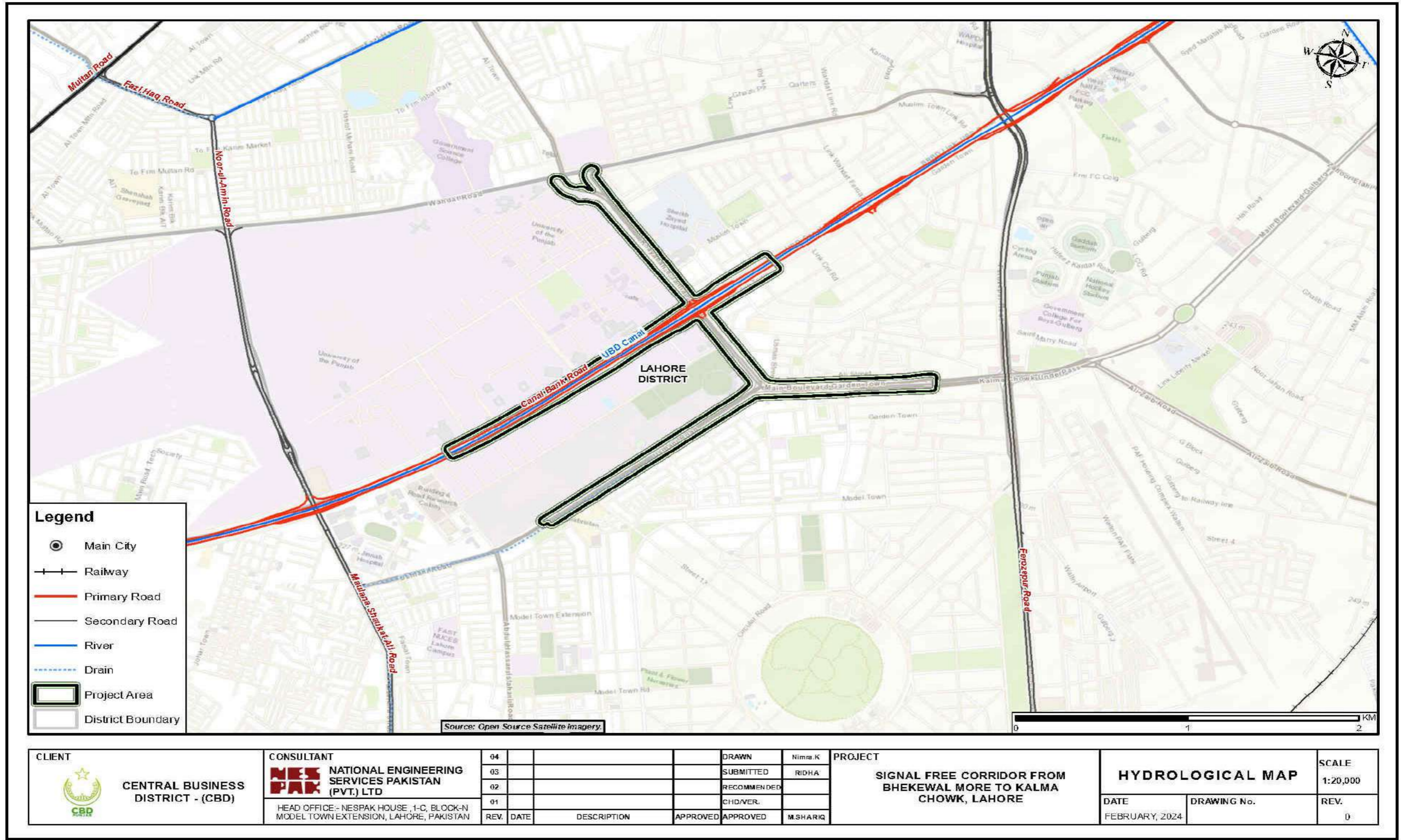


Figure 4-9: Surface Water Resources Map of the Study Area

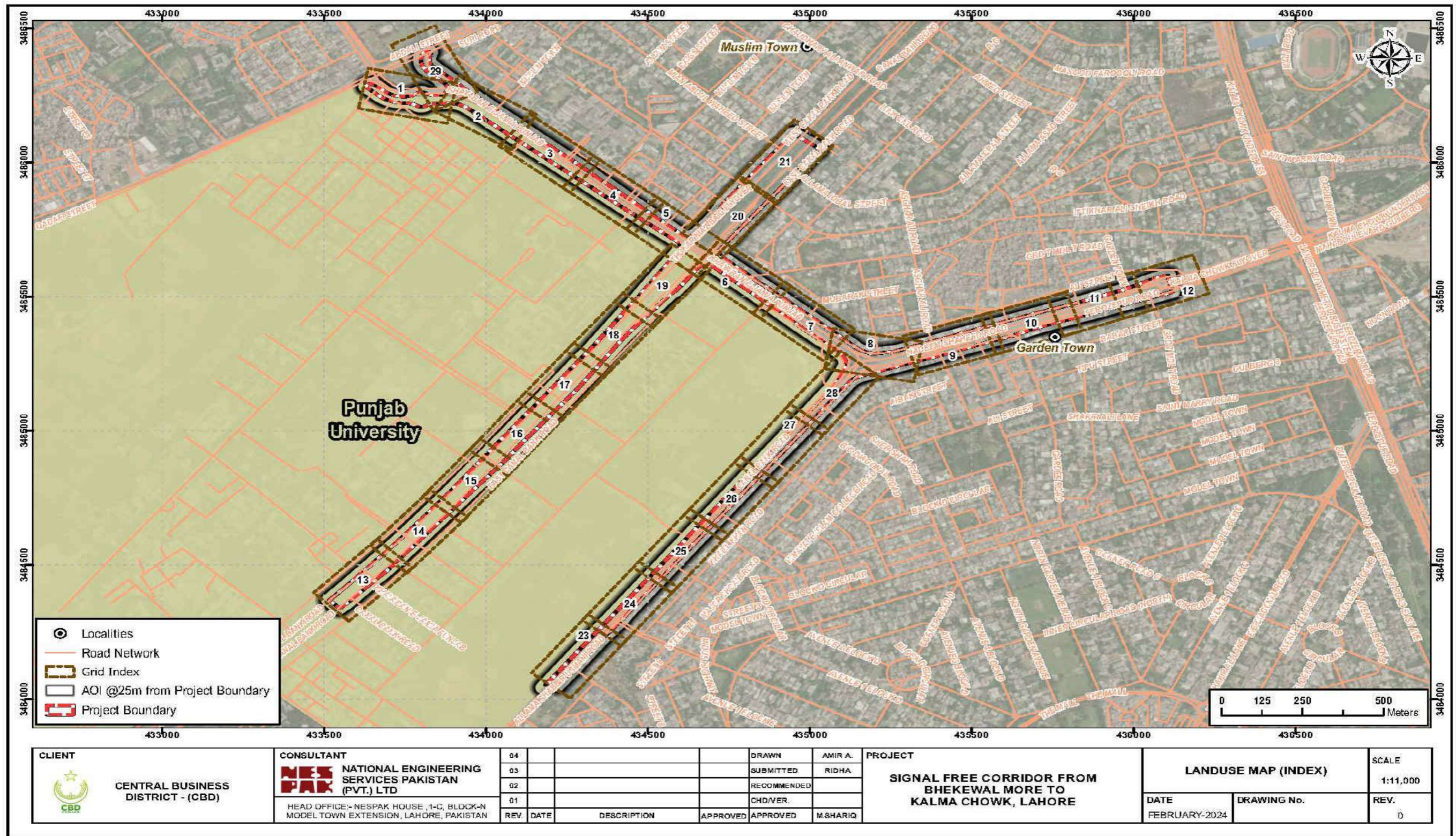
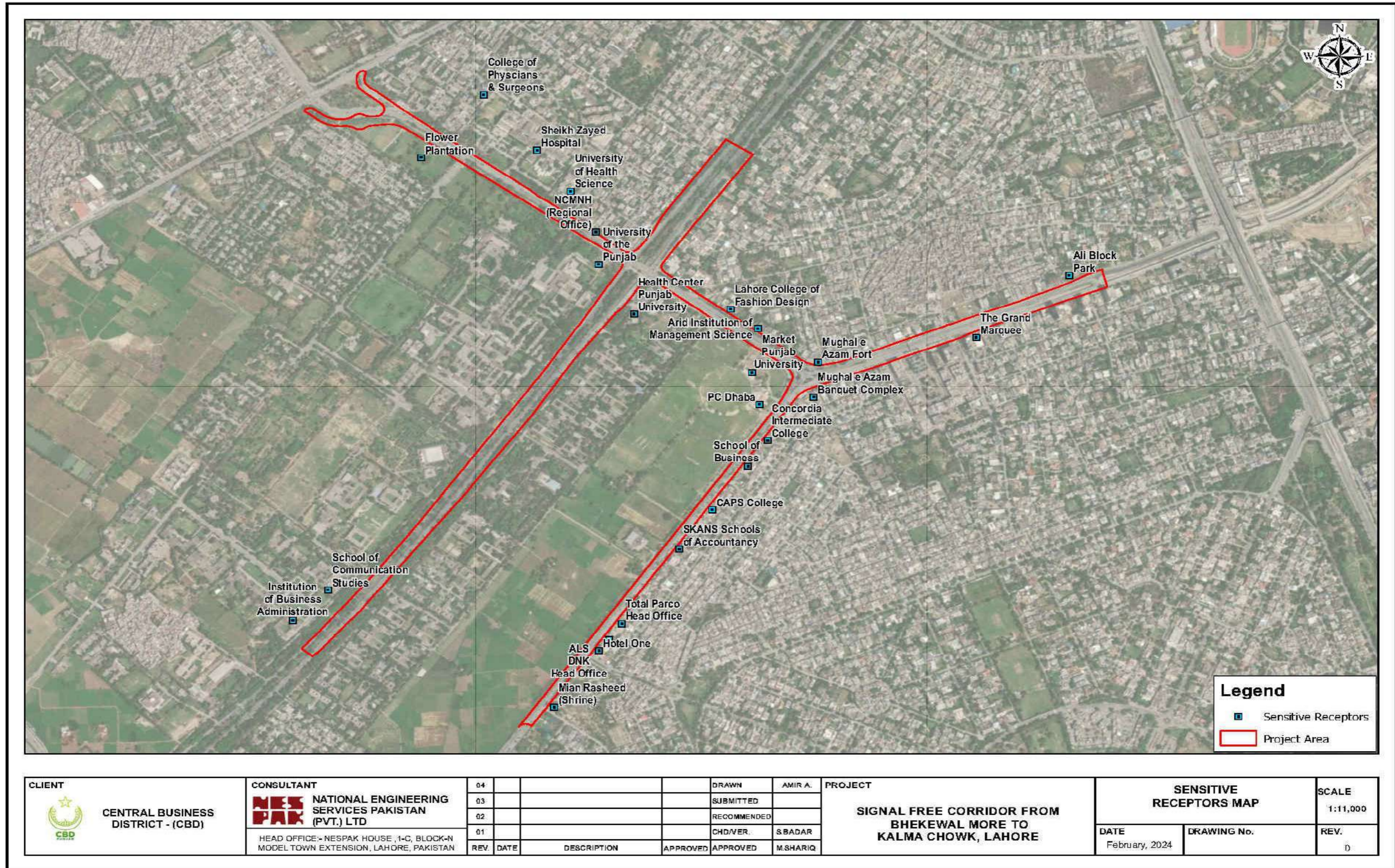


Figure 4-10: Land Use Index Map of the Study Area



CLIENT CENTRAL BUSINESS DISTRICT - (CBD)	CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE- NESPAK HOUSE, 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	AMIR A.	PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE	SENSITIVE RECEPTORS MAP		SCALE
		03				SUBMITTED					1:11,000
		02				RECOMMENDED			DATE February, 2024	DRAWING No.	REV. 0
		01				CHD/VER.	S.BADAR				
	REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ					

Figure 4-11: Sensitive Receptor Map of the Study Area

4.6 ECOLOGICAL RESOURCES

Ecological study of the area has been conducted using standard ecological assessment technique based on primary and secondary information and inclusion of additional information collected during site visit, discussion and meetings with groups of communities/public living in and around Project area coupled with expert visual observations. Following is the description of the baseline ecological environment of the area.

The climate of the area tends to have hot and sometimes extremely hot summers and mild warm winters. The soils are very fertile therefore, climate supports variety of agricultural crops and vegetables, with scare growth of indigenous flora and grasses. The proposed Project is situated in semi-arid region. The region is characterized by dry climate both in summer and winter season. The water precipitation is in the form of occasional seasonal rains, during rainy season (July – September).

As climate of Lahore is semi-arid and subtropical, the vegetation of the area falls under scrub, dry, tropical thorn forest type as per phyto-geographical classification of the area. Due to rapid increase in the population of the city and to cater for its public utility buildings, housing and commercial requirements, these agricultural lands were converted into public buildings, business centers, educational institutions and housing colonies.

4.6.1 Flora

The Project area is under intense pressure of anthropogenic factors which is damaging the local area ecosystem with pace from last many decades. This particular area has been accessible to humans for a long time resulting in low diversity and wildlife abundance. Some of the broad leaved trees exist in the area and these species still survive the on-slaught of urbanization. Some may be found in remote barren areas or in graveyards only. There is probably little natural vegetation left in tract. Natural vegetation of the Lahore region is falling under tropical thorn forest type, but no such designated forest is reported in the Project area and has long ago been replaced completely by weeds and trees.

The study area has a variety of trees. Some of the principal trees, shrubs (plants) and herbs (ground covering plants) of the Project area are given below in **Table 4.6**, which illustrates their nomenclature including local names, English names and Botanical names.

Table 4.6: Inventory of Trees Present in Lahore District

Sr. No.	Common Name	Scientific Name
1	Shisham	<i>Dalbergia sissoo</i>
2	Eucalyptus	<i>Eucalyptus camaldulensis</i>
3	Bakain	<i>Melia azedarach</i>
4	Neem	<i>Azadirachta indica</i>
5	Sirris	<i>Albizia lebbe</i>
6	Jaman	<i>Syzygium cumini</i>
7	Pipal (Sacred Fig)	<i>Ficus religiosa</i>
8	Ber	<i>Ziziphus mauritiana</i>
9	Banyan	<i>Ficus bengalensis</i>
10	Alstonia	<i>Alstonia scholaris</i>

Sr. No.	Common Name	Scientific Name
11	Toot (Mulbery)	<i>Morus alba</i>
12	Kikar	<i>Acacia modesta</i>
13	Bottle Brush	<i>Callistemon lanceolatus</i>

4.6.2 Fauna

4.6.2.1 Mammals

Common mammals found in the area are dogs, cats, house rats and bats. Small Indian Mongoose and Indian Palm Squirrel have also been reported. These are mostly seen in areas where houses have already been constructed or are under construction.

4.6.2.2 Reptiles

Snakes such as cobra, kraits etc. were once common in the tract, but now cases of snake bites are very rare, as these reptiles have been either killed by expanding urbanization or they have moved away. Lizards such as Spiny tailed lizard (*Uromastixhardwickii*) and fringed toed lizard (*Acanthodactylus cantoris*) are also reported by the residents of the area.

4.6.2.3 Amphibians

Amphibians frequently seen in and around the Project area, especially during rainy season, include common Frog (*Ranatigrina*) and Indus valley toad.

4.6.2.4 Birds

House sparrow (*Passer domesticus*), House crow (*Corvussplendens*) and Mynah (*Acredotherestrictis*) are the most common in the area. In addition, following birds have also been observed in the area.

- Nightingale (*Pycnontuscafer*)
- Parrot (*Psittaculakrameri*)
- Pigeon (*Columba livia*)
- Hoopoe (*Upupa epops*)

There are no endangered species of flora and fauna in the study area.

4.6.2.5 Wildlife Sanctuaries and Game Reserves

No wildlife sanctuary or game reserve is located in the vicinity of the study area.

4.6.2.6 Critical Habitats

No critical habitat exists near the Project area or the study area and therefore it can be stated that this Project does not affect any critical habitat.

4.7 SOCIO-ECONOMIC ENVIRONMENT

This section deals with the social conditions of the Project Area. During the desk/ office study, available reports/ documents were comprehensively studied. During the field visit different stakeholders were consulted i.e. residents, shopkeepers, communities and relevant departments. Observations were taken after giving due consideration to the desk/ office study results.

4.7.1 Data/Information Source

For the socioeconomic baseline information, both primary and secondary sources of data were used.

4.7.2 Secondary Data

Secondary data collected by exploring the relevant documents. Common sources of secondary data for the study include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes. In this EIA Report, secondary data was derived from District Census Report Lahore, 1998 and Pakistan Bureau of Statistics (Census 2017) for socioeconomic baseline survey.

4.7.3 Primary Data

In addition, to the review of secondary data, field visits of the proposed Project were conducted to assess the impact assessment and local communities were also consulted to obtain their views and concerns about the Project.

4.7.4 Location of Lahore City and the Project area

Location of Lahore City is bounded on the North and West by Sheikhpura District, on the east by India and on the south Kasur District. River Ravi flows on the northern side of Lahore. Total land area of the city is 404 sq. Km. Altitude of the city lies between 31-15 and 31-45 North latitudes and 74-01 and 74-39 East longitude. The Project lies in the Walton area and the nearby settlement is Ghausia Colony.

4.7.5 Political and Administrative Setup

The Project area falls in the administrative jurisdiction of District Lahore. In district Lahore, Commissioner is the highest ranked administrator of the district. For the collection of revenue and administration, the district is subdivided into Tehsils. Local governments also administer the area through Union Councils and Tehsils. The total area of the District Lahore is 1,772 square kilometers.

4.8 DEMOGRAPHIC CHARACTERISTICS OF PROJECT AREA

The total population of Lahore District was 6,340,114 as enumerated in March 1998 with an intercensal percentage increase of 78.3 since March 1981 when it was 3,544,942 souls. The average annual growth rate of population in the district during intercensal period 1998-2017 was 3 percent. The total area of the district is 1,772 square kilometers which gives population density of 3,566 persons per square kilometer as against 2,000 persons observed in 1981 indicating a fast growth rate of the district. Afterwards, massive efforts are made by Government of Pakistan to count the latest population. Census Bureau carried out latest census and released the latest statistics of 2017. The annual growth rate is 3.0% and the population of District Lahore is estimated as 11,126,285 persons out of which 5,824,131 were male and 5,300,931 were female. Sex ratio is measured as 109.87 percent. **Table 4.7** gives Households, Population Increase, Sex Ratio and Growth Rates of Lahore District, for the year of 2017.

Table 4.7: Households, Population Increase, Sex Ratio and Growth Rates in Lahore

Households	Population-2017				Population 1998	Sex Ratio 2017	1998-2017 Average Annual Growth Rate
	Male	Female	Transgender	All Sexes			
1,757,691	5,824,131	5,300,931	1,223	11,126,285	6,340,114	109.87	3.00

Source: Pakistan Bureau of Statistics (Census 2017)

The sex ratio is an important demographic indicator, which is defined as the “number of males per hundred females”. According to census 2017, Sex ratio is measured as 109.87 percent. Lahore is a young city with over 40% of its inhabitants below the age of 15. The average life expectancy stands at less than 60 years of age.

4.8.1 Rural and Urban Distributions

According to Census of 2017, the district Lahore falls 100% in the urban area with **1,757,691** number of households.

4.8.2 Migration

The total number of life time in-migrants in Lahore district was 1,034,848 or 16.4 percent of the population of the district. Out of total, 71.7 percent district migrants came from other districts of the Punjab, 10.1 percent were from Sindh, KPK and Baluchistan, 1.3 percent from Azad Kashmir and Northern Areas while remaining 16.9 percent were Pakistanis who repatriated from other countries. **Table 4.8** shows life time in-migrants with their decomposition by place of origin, and place of settlement in rural and urban areas of the district.

Table 4.8 : Life Time Migrants in the District by Rural/ Urban Areas, 1998

Description	Migrants by Residence		
	All Areas	Rural	Urban
Total in-migrants	100	100	100
Migrants from the same province	71.7	79.4	70.5
Migrants from other provinces	10.1	6.1	10.7
Migrants from AK/ NA	1.3	0.8	1.4
Migrants from other countries	16.9	13.7	17.4
Migrants from places not reported	**	0	*

Source: DCR of Lahore District, 1998

4.8.3 Religion

The population of the district is predominantly Muslims i.e. 93.9 percent. The next higher percentage is of Christians with 5.8 percent followed by Ahmadis 0.2 percent. While other minorities like Hindu etc. are very small in number.

4.8.4 Mother Tongue

The mother tongue refers to the language used for communication between parents and their children in any household. Punjabi is the predominant language being spoken by majority (86.2 percent) of the population of the district followed by Urdu, Pushto and Siraiki being spoken by 10.2, 1.9, and 0.4 percent. Sindhi is spoken by 0.1 percent.

4.8.5 Ethnic Structure

The main castes and groups of the Lahore District are Jatt, Rajput, Malik, Butt, Pathan, Mughal, Sheikh, Gujjar, Kombh and Arain. Besides, there are also village artisans, which include Lohars (blacksmiths), Tarkhan (carpenter), Kumhars (potters), Mochis (cobblers), Machhis (water-carriers), barbers and weavers etc.

4.9 ECONOMIC CONDITIONS

The economically active population is defined here as the persons working most of the time during the year preceding the census date i.e. 5th March, 1998, looking for work, lay off and un-paid family helpers assisting their family. The economically active population as enumerated in the last census was 21.8 percent of the total population or 29.5 percent of the 10 years and over i.e. the population exposed to the risk of entering the economically active life at any time. The formal percentage is known as Crude Activity Rate (CAR), while the latter is known as Refined Activity Rate (RAR). Of the total male population 39.9 were economically active, while 60.1 percent were inactive, 25.4 percent children under 10 years, 18.0 percent students, 1.9 percent domestic workers, while 14.8 percent were landlords, property owners, retired persons, disabled etc.

4.9.1 Unemployment

Unemployment rate is measured as ratio of looking for work and laid off in total economically active population comprising employed, looking for work, laid off and unpaid family workers, generally representing in percentage. The unemployment rate was 20.7 percent, which was mainly due to unemployment amongst males representing 21.4 percent, while female unemployment rate was just 2.2 percent. This is because of their small proportion in total economically active population.

4.9.2 Employed Population by Occupations

In 1998 of the total employed persons, 44.7 percent had elementary occupations, followed by service workers, and shop and market sale workers, 17.5 percent and professional 9.2 percent. In rural areas, people having elementary occupations, were again in majority followed by skilled agricultural and fishery works and service workers and shop and market sale workers represented 52.5, 23.7, and 8.4 percent respectively. The highest percentage in urban area is of elementary occupations too, followed by service workers and shop and market sales workers and crafts and related trade workers and having 43.2, 19.3 and 9.1 percent respectively.

4.9.3 Industry, Trade and Trade Centers

After Karachi, Lahore is the biggest industrial area in Pakistan. There has been a steady expansion of industries in and around Lahore since independence. There are many large industrial units in the district. These units manufacture cotton, woolen and silk cloths, carpets and rugs, textile products, leather and rubber foot wears, wearing apparel, pharmaceutical goods, soap, iron and steel products, heating, plumbing and lighting equipment, hardware, miscellaneous fabricated products, agriculture machinery, engines and turbines, textile machinery, printing machinery, metal working machinery, pumps and compressors, household machinery, water generators, motor generators, transformers, electric fans, communication equipments, cycles and rickshaws. There are also a good number of printing and publishing units and body building workshops. Besides, there are units of canning and preservation of food, edible oils, beverages, metal and wood furniture, rubber products, chemicals, glass products, repair of railway equipment, toys and stationary etc.

The Lahore Expo Centre is one of the biggest projects in the history of the city and was inaugurated on May 22, 2010 and there are various business centers and hub of commercial activities, i.e. Emporium Mall, Packages Mall, Mall of Lahore and other markets where customers from all over the country visit.

4.9.4 Educational Facilities

Lahore is an old first class seat of learning in Pakistan. The world famous and the oldest university of Pakistan i.e. University of the Punjab is located in this city. The pioneer University of Engineering and Technology is also in Lahore. There has been a significant development in the educational sector of this district. University of the Punjab has been



extended and its new campuses are constructed along the Lahore branch of Upper Bari Doab canal. This provides an ideal environment for teachers and taught in the green lush area surrounded by New Muslim Town, Wahdat Colony, PCSIR Colony, Faisal Town and Garden Town.

4.9.5 Health Facilities

Ample medical and health facilities are available in the Lahore Metropolitan Corporation area and its suburbs. Shaukat Khanam Hospital is the largest medical care facility in Lahore for the most dangerous disease in the country i.e. Cancer. There are also other hospitals of voluntary organizations, which provide health cover to the public. King Zaid Bin Sultan Hospital is also a very advanced addition in the medical care for Lahore. Among the prominent hospitals are Lahore General Hospital, Lady Willingdon Hospital, Mayo Hospital, Fatima Jinnah Hospital, The Children Hospital, Services Hospital, and Ganga Ram Hospital etc. Besides, a number of private medical practitioners, Hakims and homeopathic doctors are also practicing in the city.

The overall health condition of the residents is good in the Project area and the common diseases were pointed out by the local people and medical practitioners, i.e. allergy, flu and fever, sugar and blood pressure.

4.9.6 Transportation

Lahore is the provincial capital of Punjab and has higher and better transportation facilities as compared to other area of Punjab. Lahore's main public transportation system is operated by the Lahore Transport Company (LTC) and Punjab Mass Transit Authority (PMTA). The backbone of its public transport network is the PMTA's Lahore Metro Bus and Orange Line Train of the Lahore Metro. LTC and PMTA also operate an extensive network of buses, providing bus service to many parts of the city and acting as a feeder system for the Metro bus.

4.9.7 Railways

The Pakistan Railways headquarters is located in Lahore. Pakistan Railways provides an important mode of transportation for commuters and connects distant parts of the country with Lahore for business, sight-seeing, pilgrimage, and education. The Lahore Central Railway Station, built during the British colonial era, is located in the heart of the city.

4.9.8 Rickshaw and Cabs

Auto rickshaws and Cabs play an important role of public transport in Lahore. There are auto rickshaws, often simply called autos, in the city. Motorcycle rickshaws, usually called "chingchi", are also a very common means of domestic travel.

Radio cab services like Uber and Careem have been recently introduced by some private companies, which are now-a-days, is used as common mean of transportation by local population. In the Project area, there are many access roads which are linked to residential



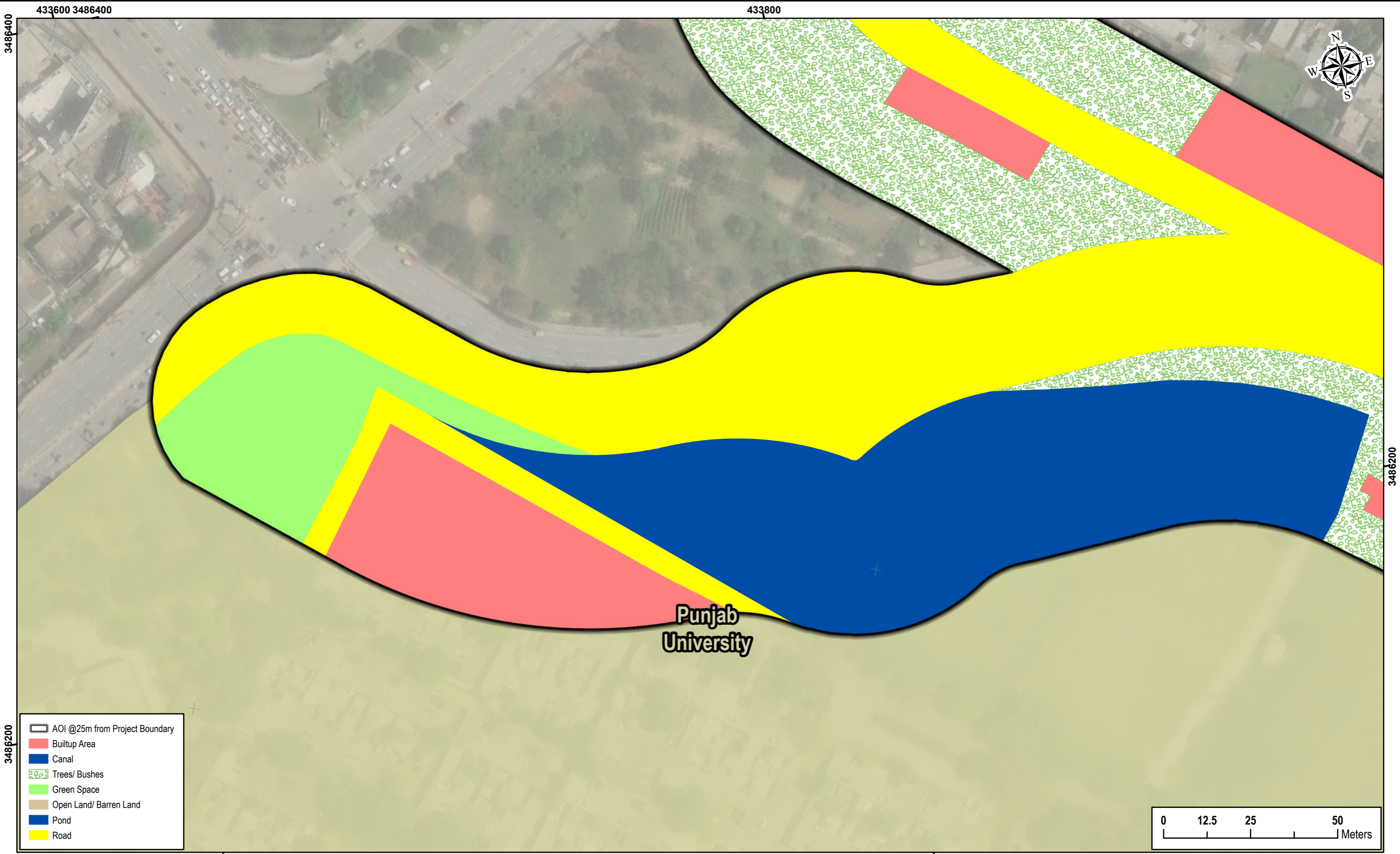
as well as commercial places. The common mean of transportation in Project area is private and local buses, cabs and rickshaws, private cars and motor bikes.

4.9.9 Archeological and Cultural Property/ Places of Interest

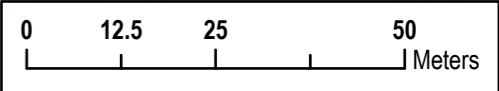
Lahore's modern city space consists of the historic walled city of Lahore in the northern part of the city, which contains several world and national heritage sites. The most common places of interest in Lahore city, i.e. Royal Fort Lahore, Minar-e-Pakistan, Badshahi Mosque, Wazir Khan Mosque, Grand Jamia Mosque Bahria Town, Shrine of Data Ganj Bakhsh, Shrine of Madhu Lal Hussain; Lahore Museum, Shalimar Garden, Jallo Park, Lahore Zoo, Tomb of Allama Iqbal, Tomb of Anarkali, Tomb of Nur Jahan and Jahangir's Tomb and Wagah Border.

ANNEXURES

Annexure-I: Detailed Land Use Map



	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road




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PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

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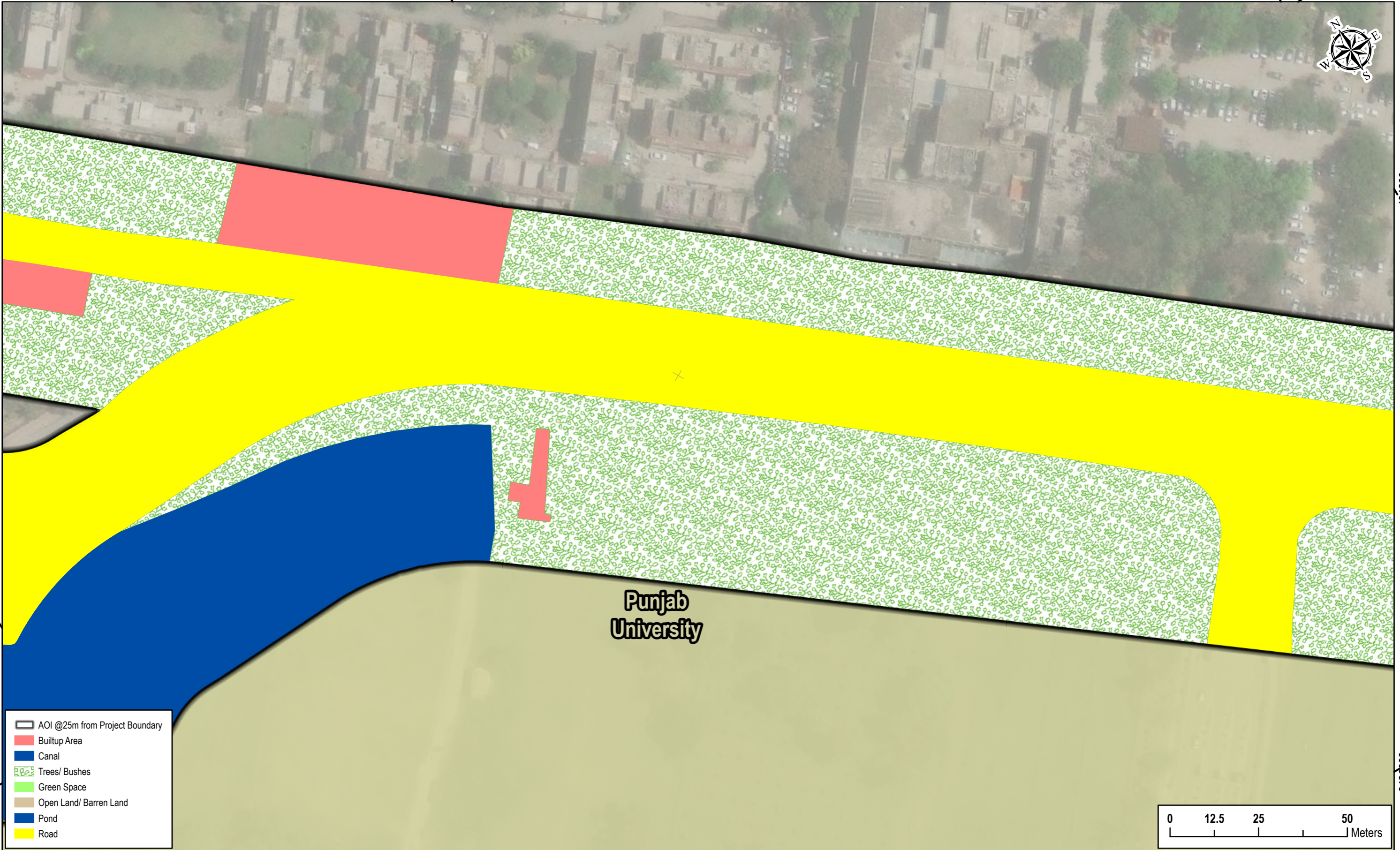


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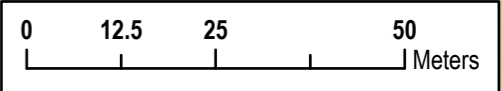
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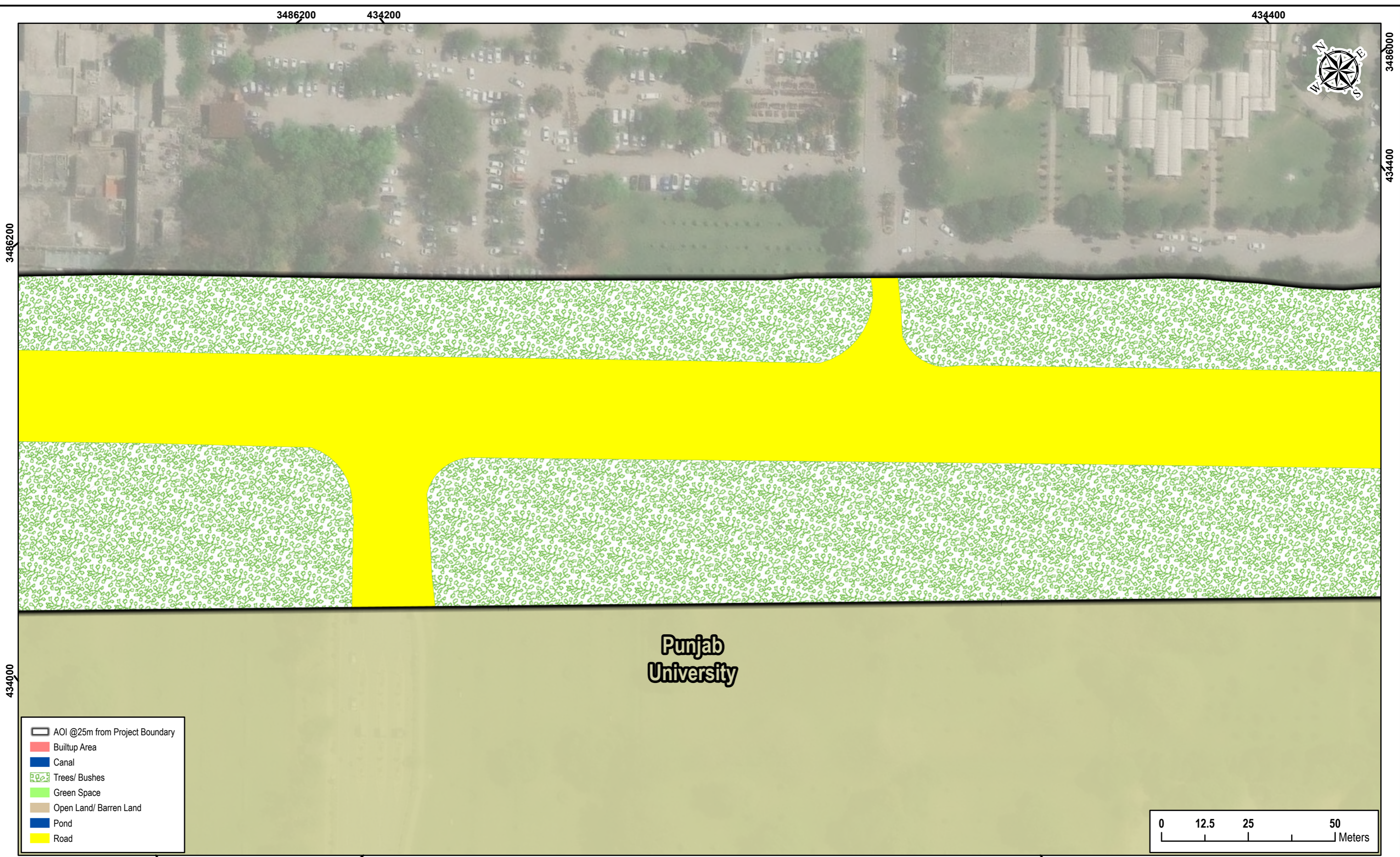
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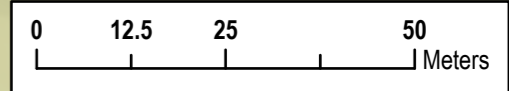
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Punjab University

- AOI @25m from Project Boundary
- Builtup Area
- Canal
- Trees/ Bushes
- Green Space
- Open Land/ Barren Land
- Pond
- Road



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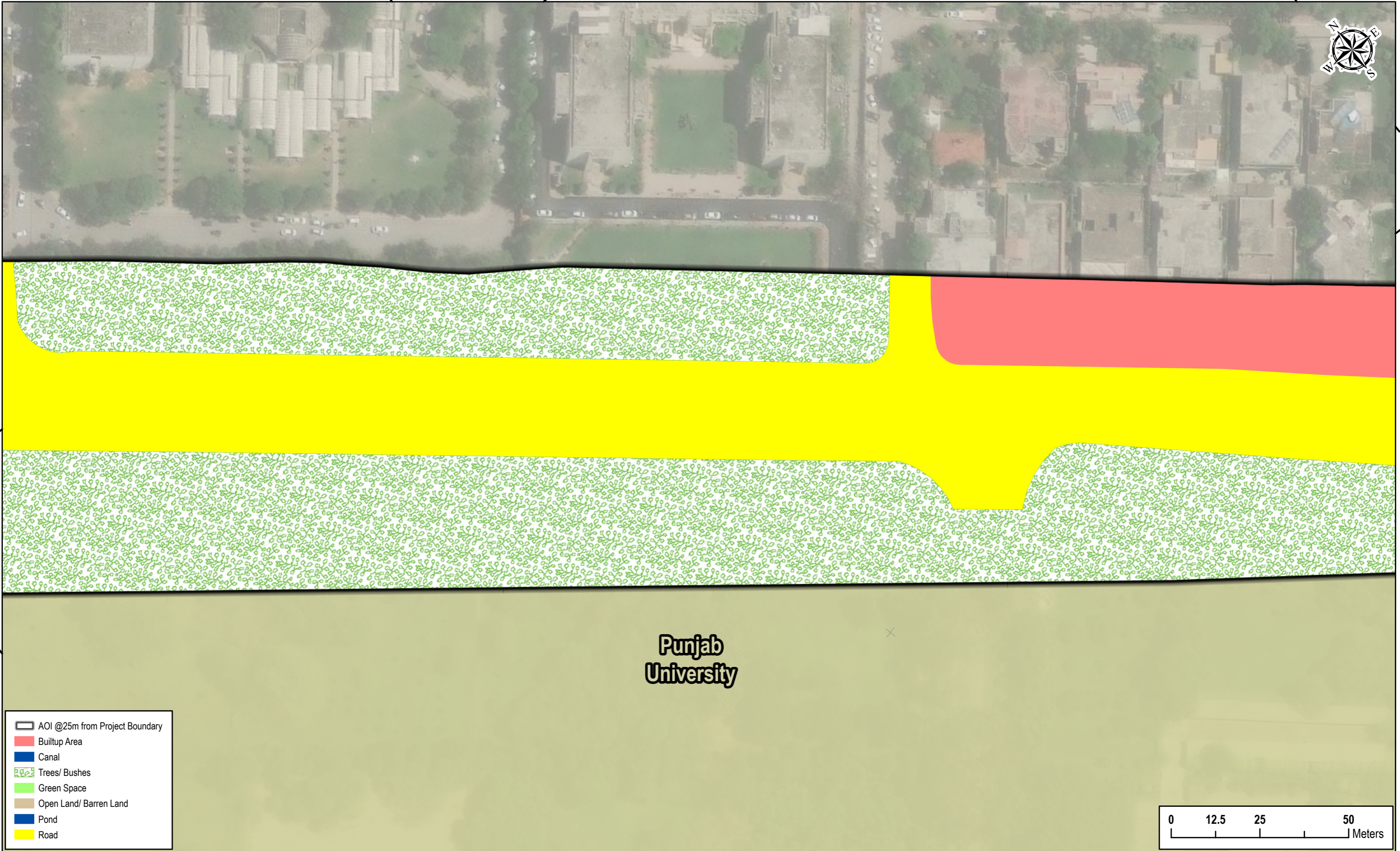
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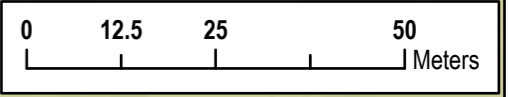
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	AOI @25m from Project Boundary
	Builtup Area
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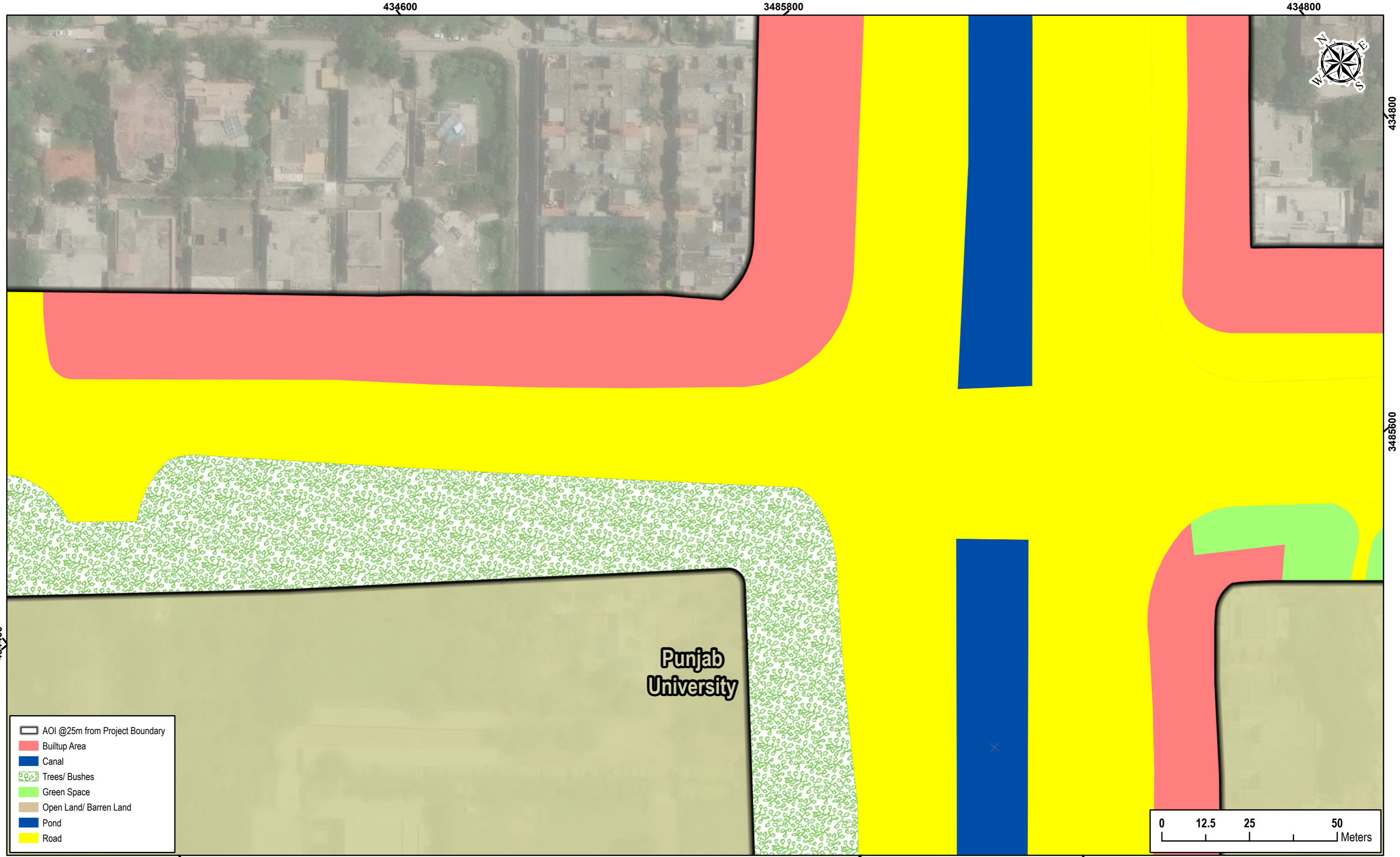
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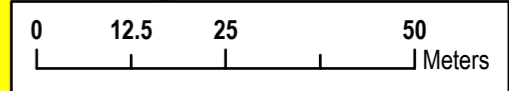
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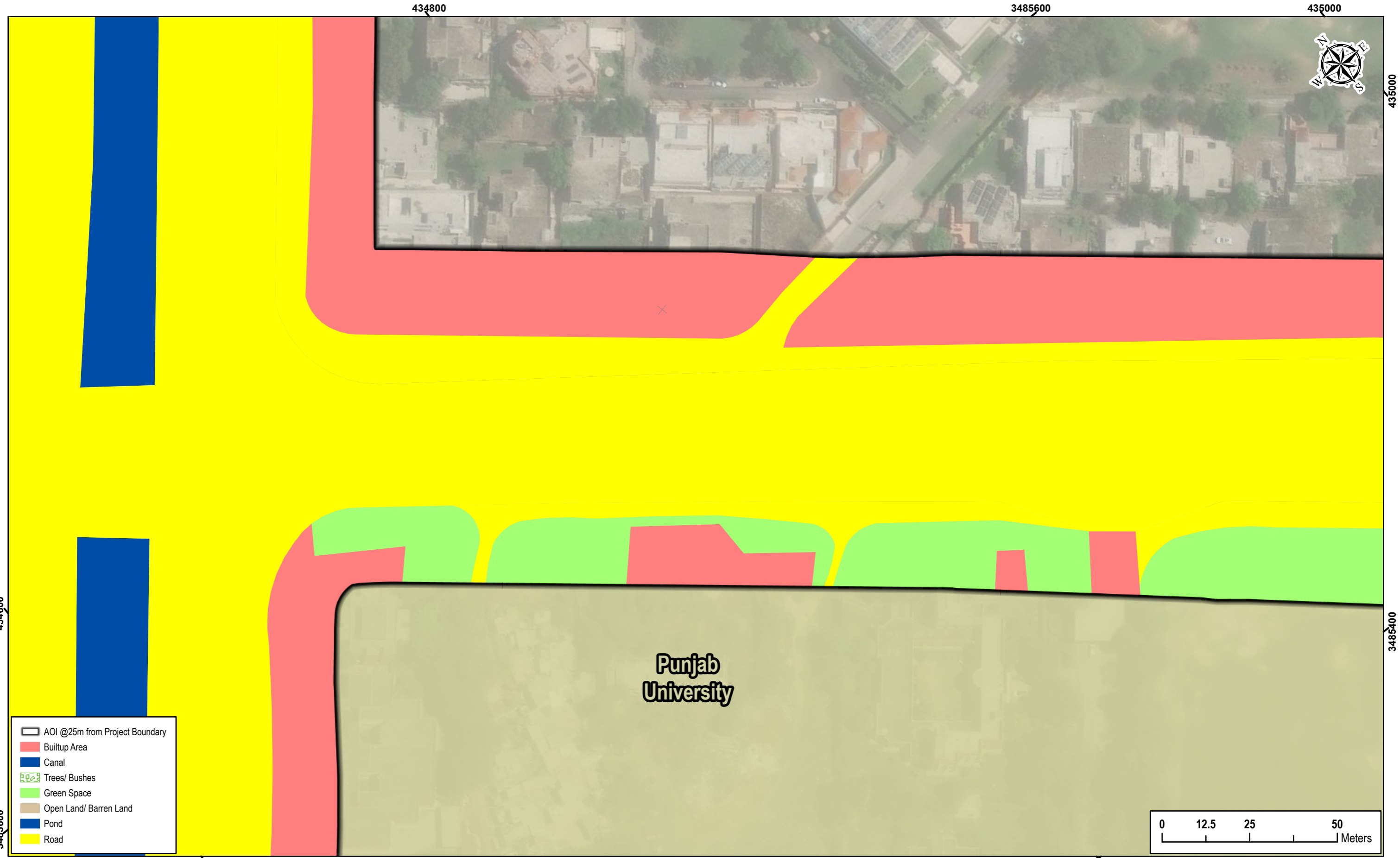
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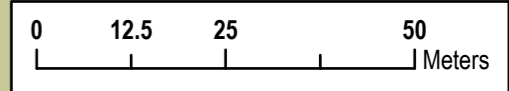
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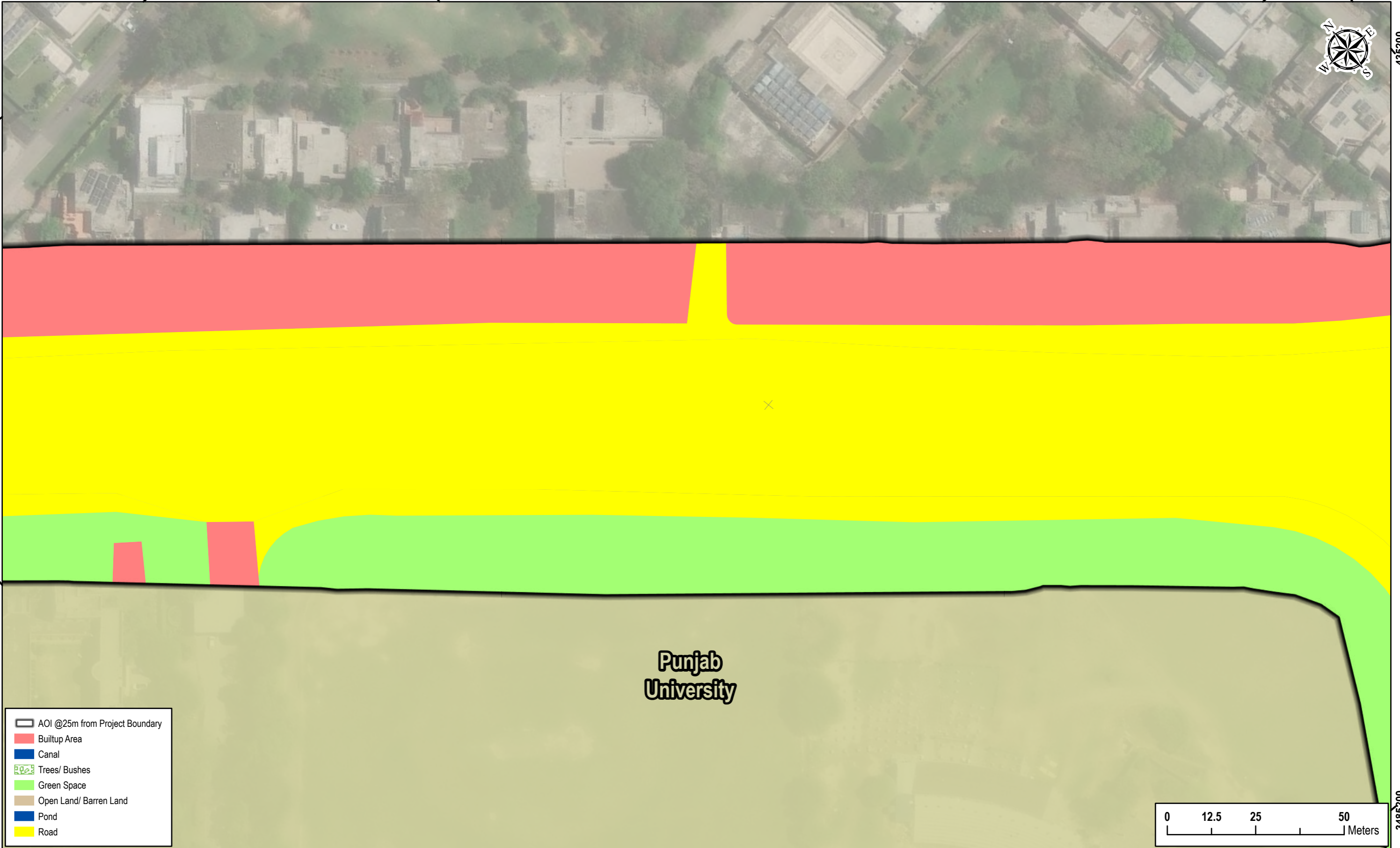


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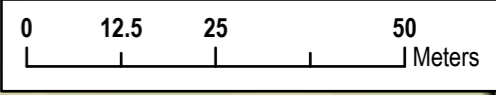
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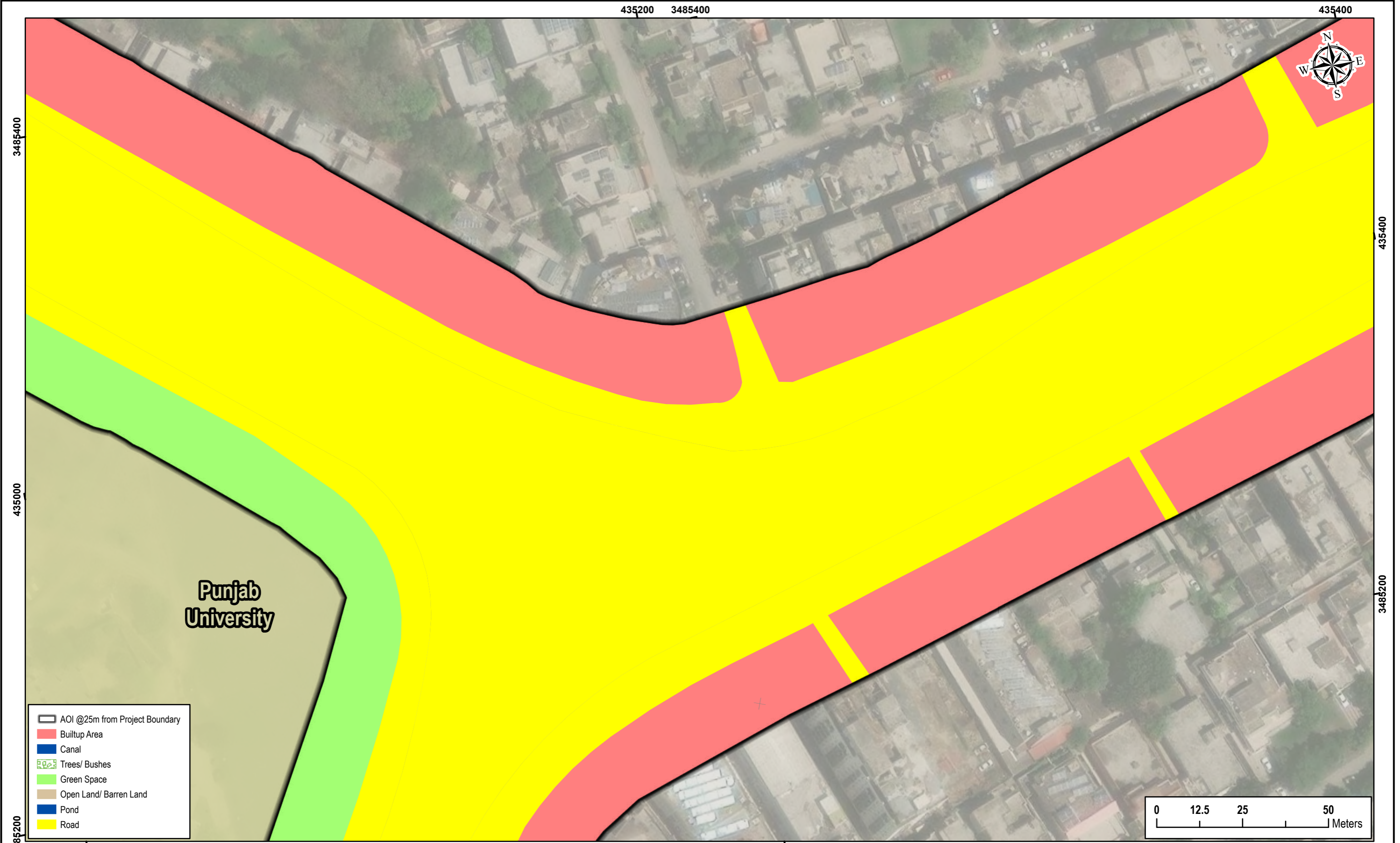
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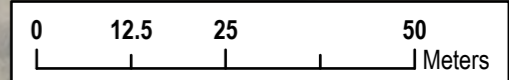
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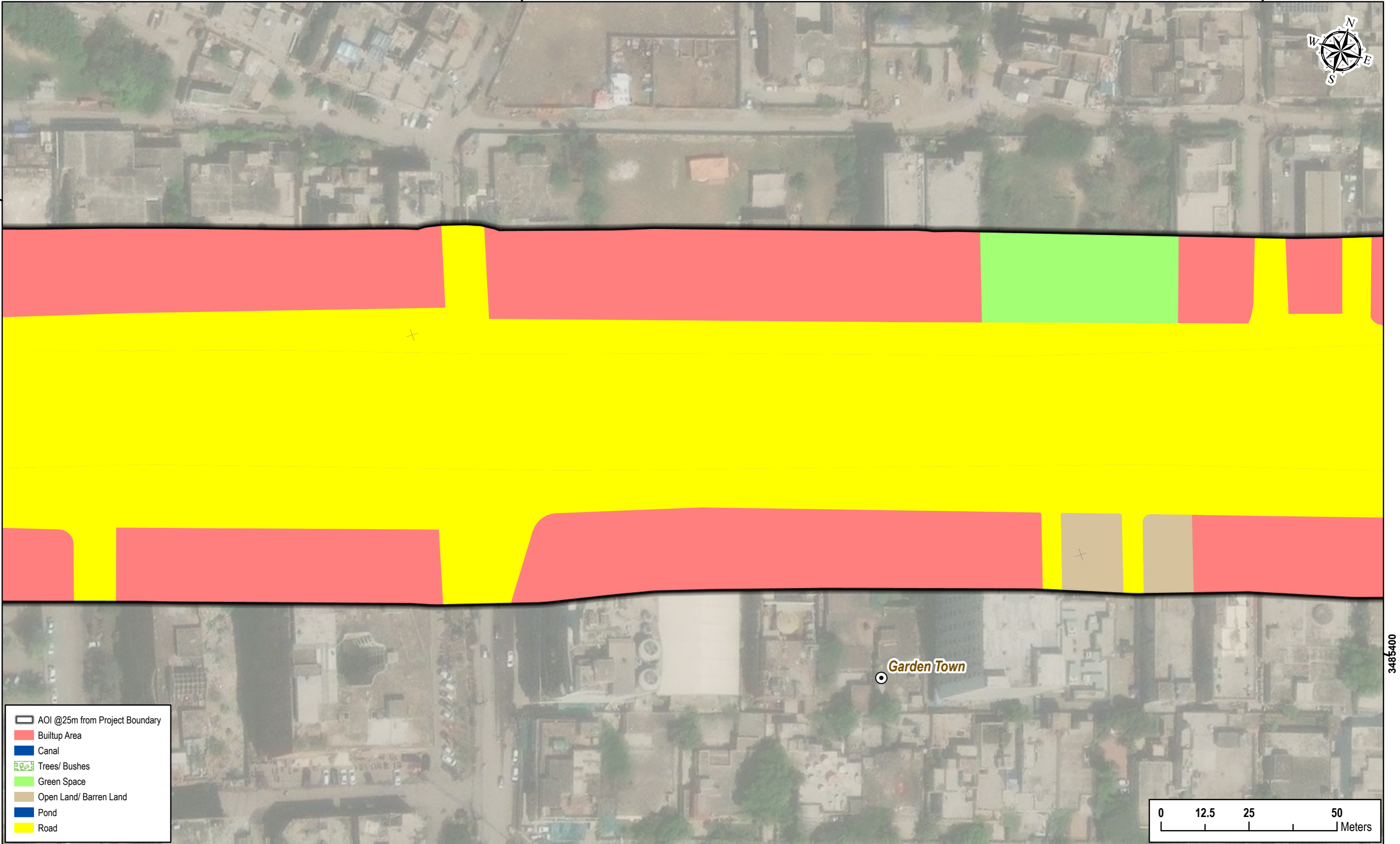
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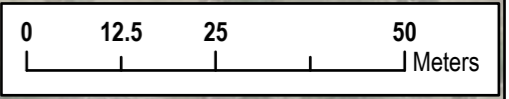


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02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	10 of 28	0

435800

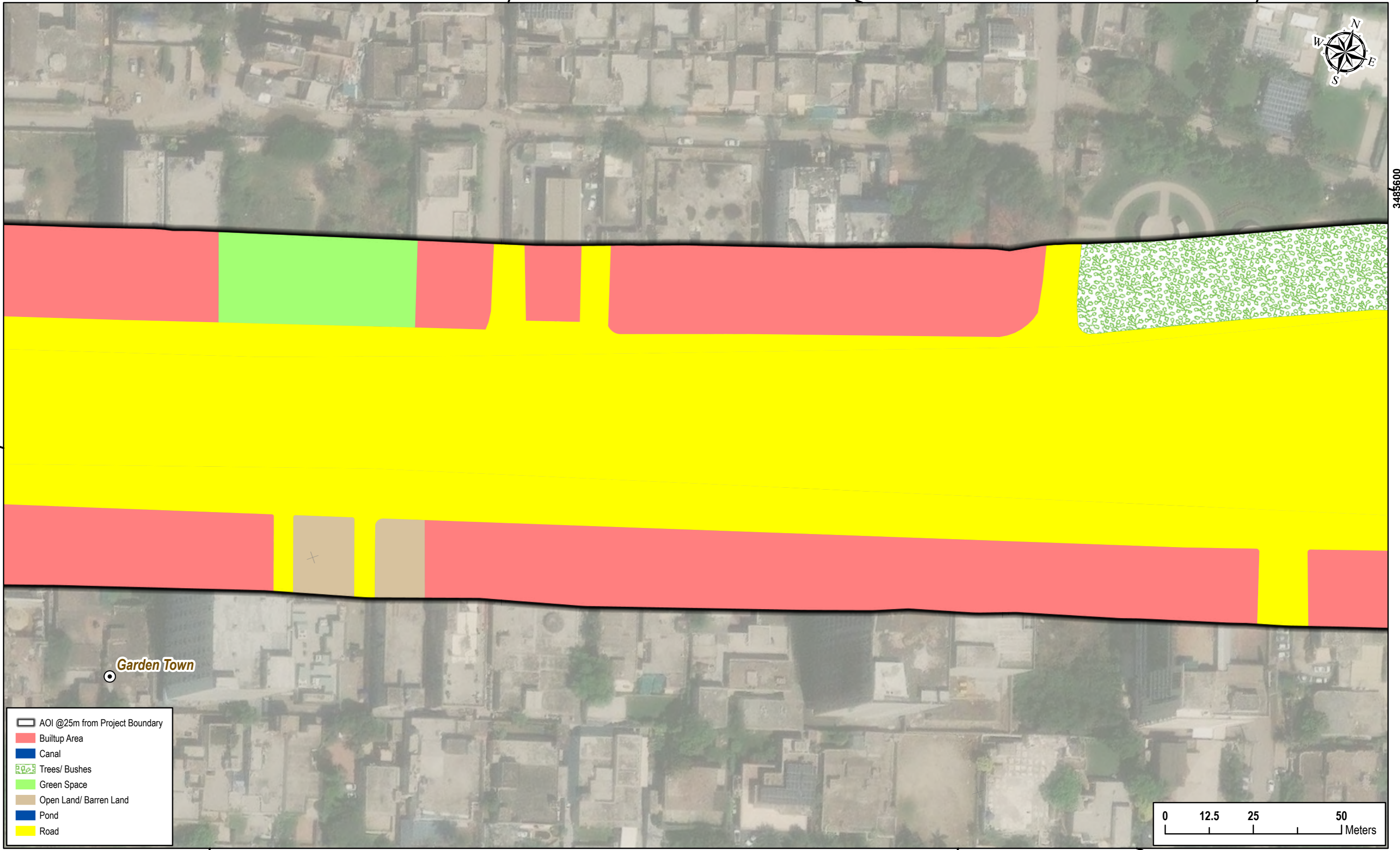
3485600

436000



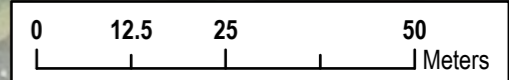
3485600

3485400



Garden Town

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



435800

436000

3485400

CLIENT

CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE, 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

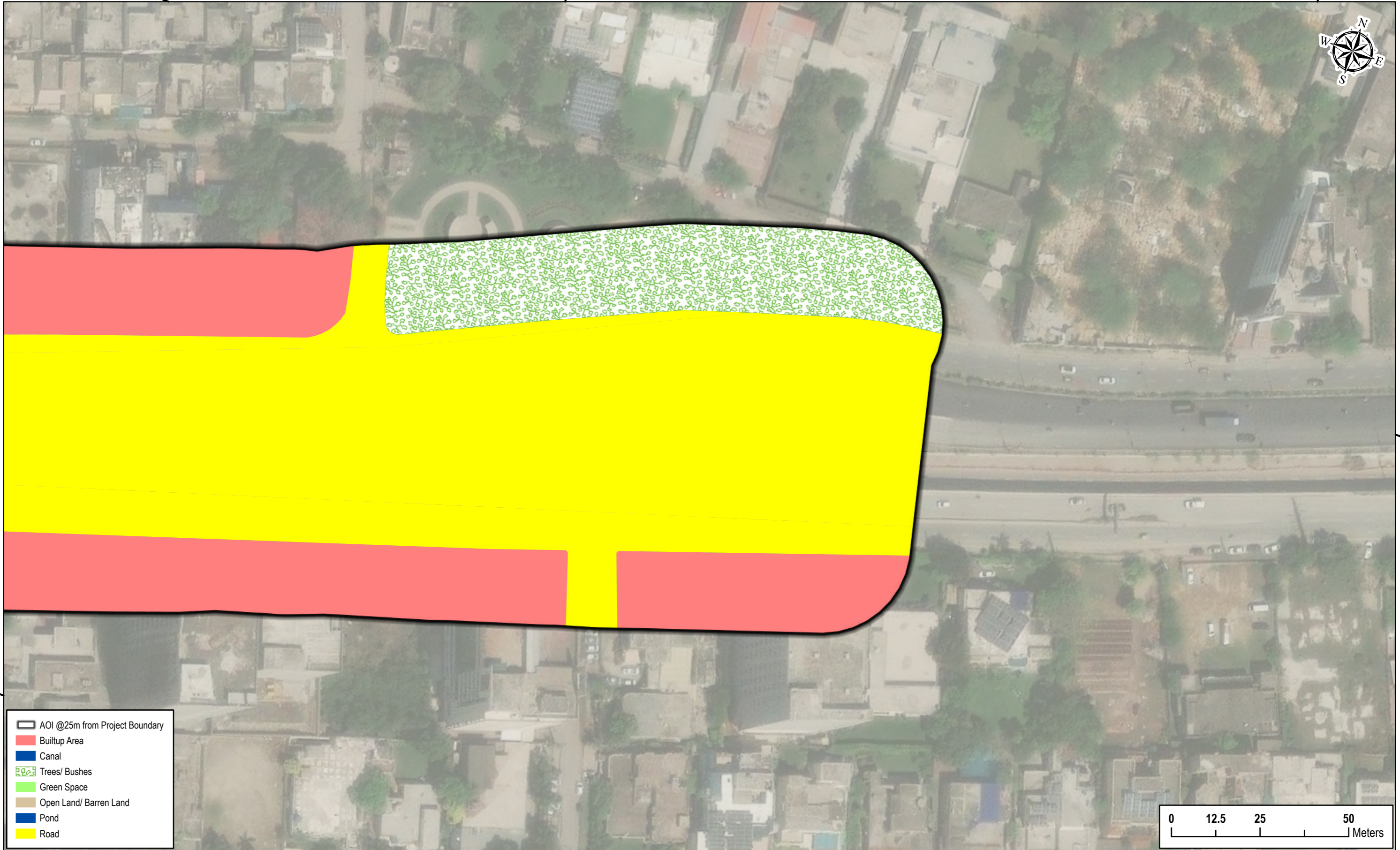
SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
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DATE	DRAWING No.	REV.
FEBRUARY-2024	11 of 28	0

3485600

436000

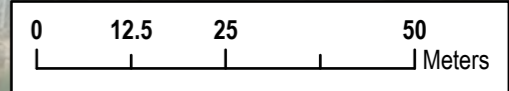
436200



3485400

3485600

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



436000

3485400

436200

CLIENT

CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE, 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

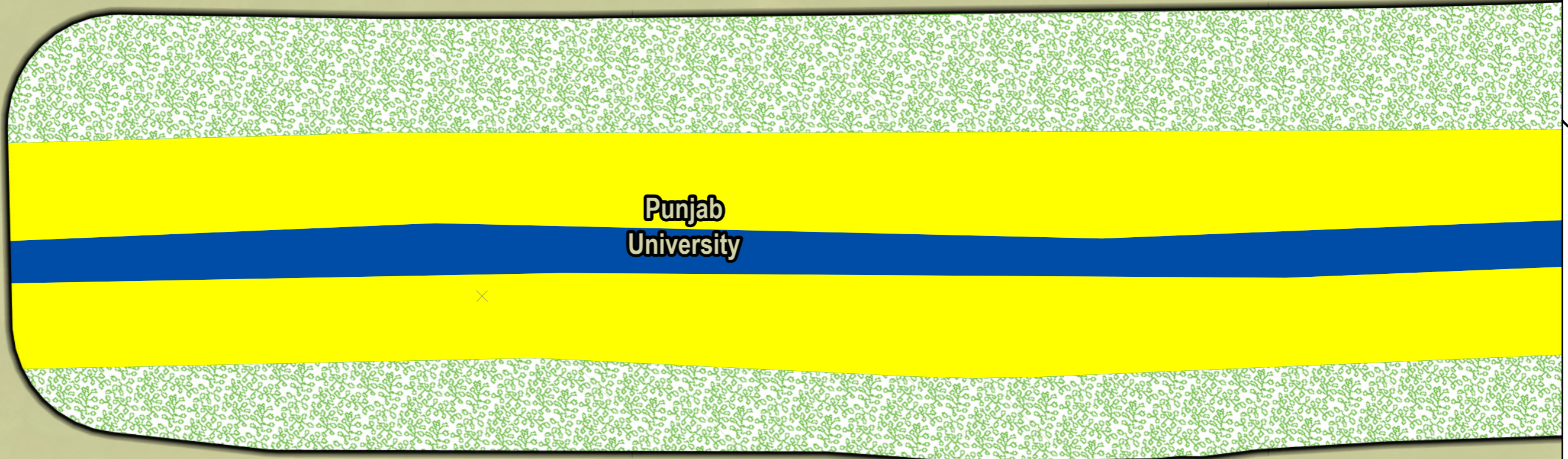
PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	12 of 28	0

433400 3484400

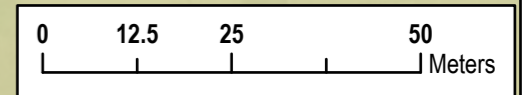
433600



3484600

433800

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



433600

3484400

433800

<p>CENTRAL BUSINESS DISTRICT - (CBD)</p>	<p>CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN</p>	04				DRAWN	AMIR A.	<p>PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE</p>	<p>LANDUSE MAP</p>		SCALE
		03				SUBMITTED	RIDHA				1:1,000
		02				RECOMMENDED			DATE FEBRUARY-2024	DRAWING No. 13 of 28	REV. 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				

433600 3484600

3484800 433800



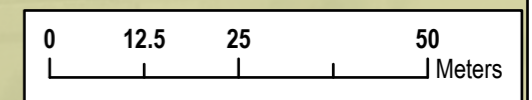
433600

3484800



Punjab University

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



3484400

433800

3484600

434000

434000

<p>CENTRAL BUSINESS DISTRICT - (CBD)</p>	<p>CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN</p>	04				DRAWN	AMIR A.	<p>PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE</p>	<p>LANDUSE MAP</p>		SCALE
		03				SUBMITTED	RIDHA				1:1,000
		02				RECOMMENDED			DATE FEBRUARY-2024	DRAWING No. 14 of 28	REV. 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				

3484800

433800

3485000



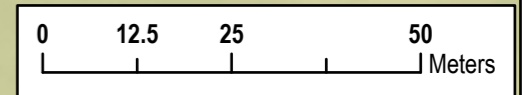
434000

3485000

433800

Punjab University

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



3484600

3484600

434000

3484800

CLIENT CENTRAL BUSINESS DISTRICT - (CBD)	CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	AMIR A.	PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE	LANDUSE MAP		SCALE
		03				SUBMITTED	RIDHA				1:1,000
		02				RECOMMENDED			DATE FEBRUARY-2024	DRAWING No. 15 of 28	REV. 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				

3485000

434000

3485200



3485200

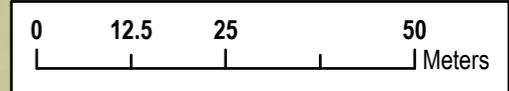
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Punjab University

434000

3484800

- AOI @25m from Project Boundary
- Builtup Area
- Canal
- Trees/ Bushes
- Green Space
- Open Land/ Barren Land
- Pond
- Road



3484800

434200

3485000

CLIENT

CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	16 of 28	0

3485200

434200

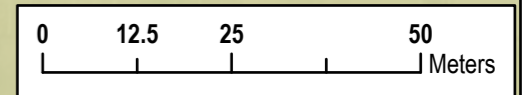


3485000

434200

Punjab University

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



3485000

434400

3485200

CLIENT CENTRAL BUSINESS DISTRICT - (CBD)	CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE, 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	AMIR A.	PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE	LANDUSE MAP		SCALE
		03				SUBMITTED	RIDHA				1:1,000
		02				RECOMMENDED			DATE FEBRUARY-2024	DRAWING No. 17 of 28	REV. 0
		01				CHD/VER.					
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				

434200

3485400

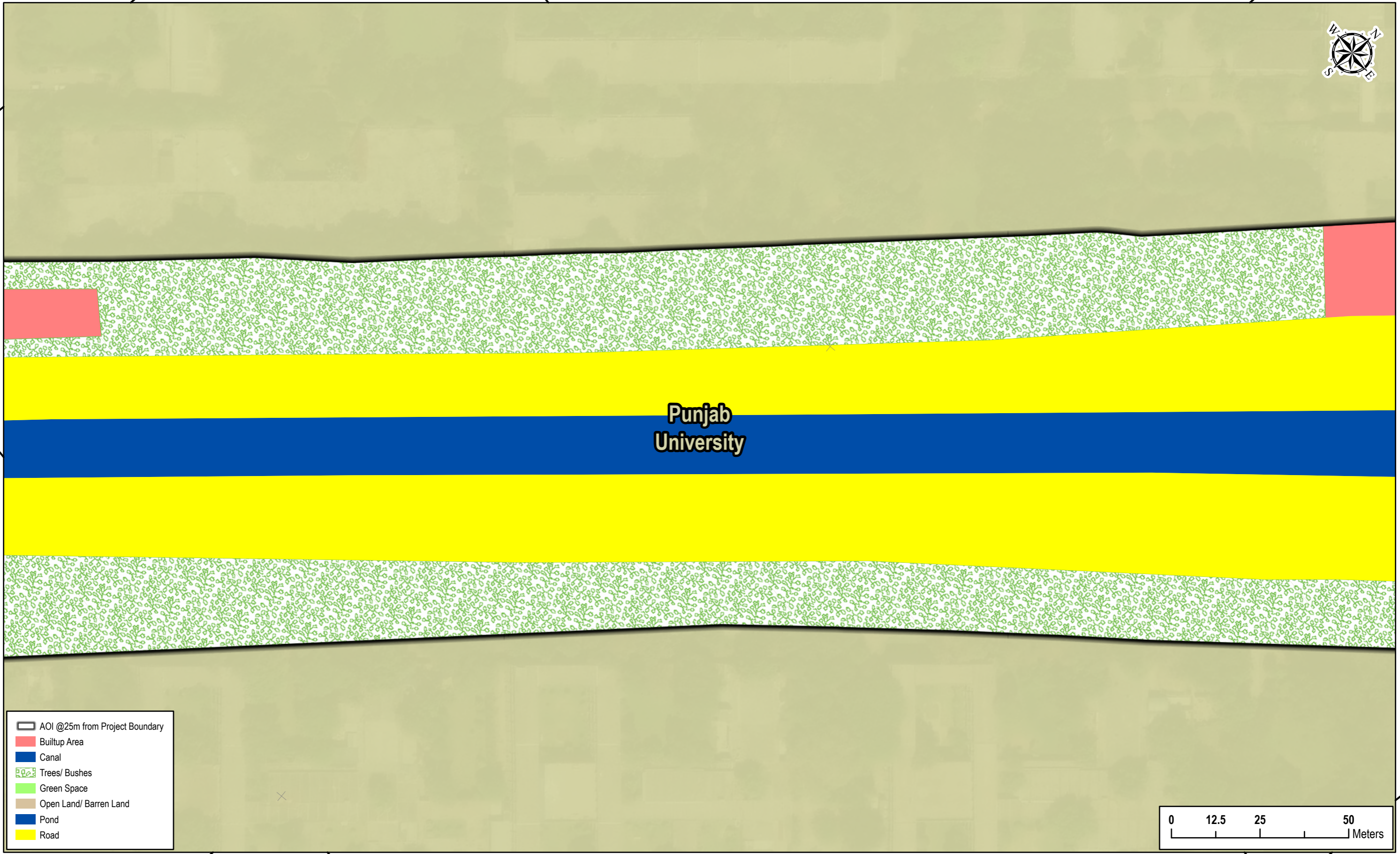
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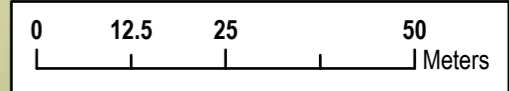
434200

3485200

434600



	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



434400

3485200

3485400


434600

CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	18 of 28	0

434400

3485600

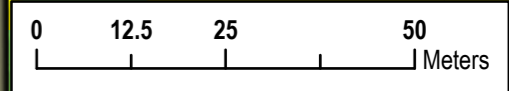


434600

434400

Punjab University

- AOI @25m from Project Boundary
- Builtup Area
- Canal
- Trees/ Bushes
- Green Space
- Open Land/ Barren Land
- Pond
- Road



3485400

434600

3485600

CLIENT

CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

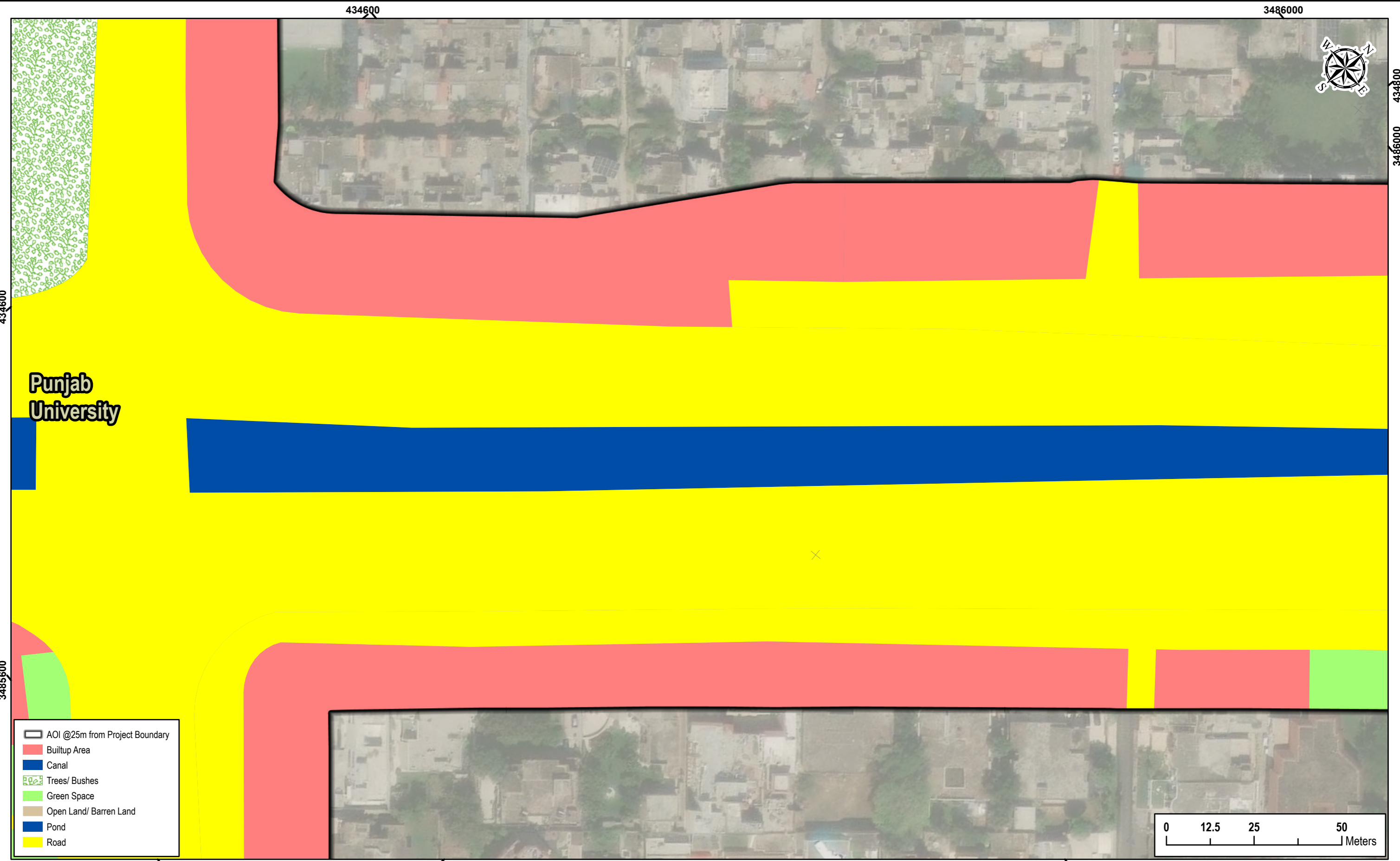
HEAD OFFICE:- NESPAK HOUSE, 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

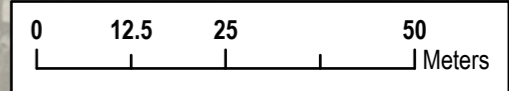
PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	19 of 28	0



	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road




CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	20 of 28	0

3486000

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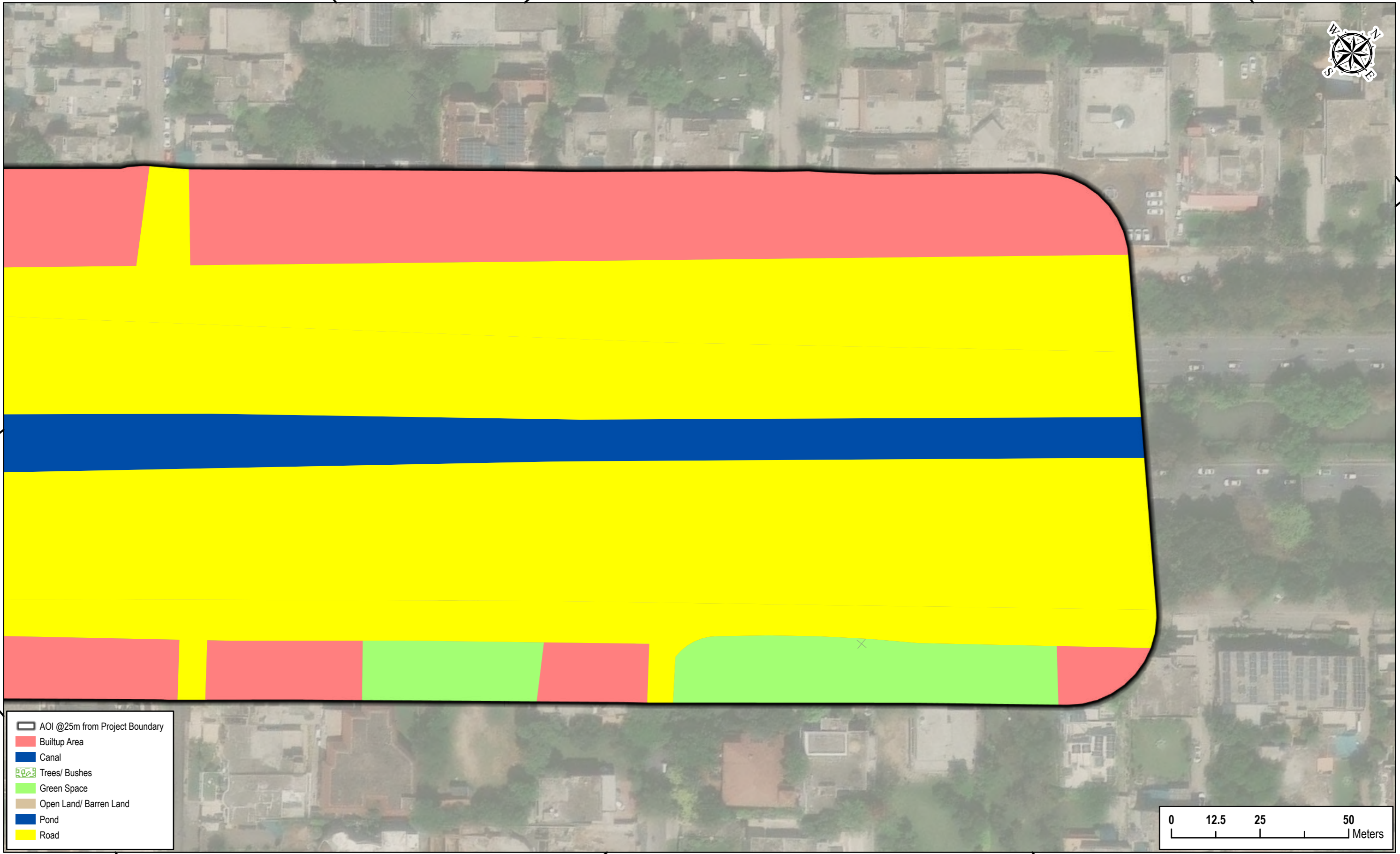
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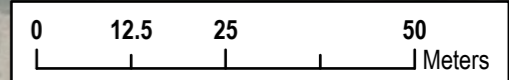
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434800

3485800



- AOI @25m from Project Boundary
- Builtup Area
- Canal
- Trees/ Bushes
- Green Space
- Open Land/ Barren Land
- Pond
- Road



3485800

435000


3486000

CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	21 of 28	0

3484200

434200



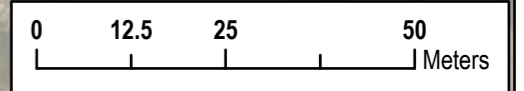
Punjab University

3484000

434200

434200

	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



3484000

434400


3484200

CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	22 of 28	0

3484400

434400



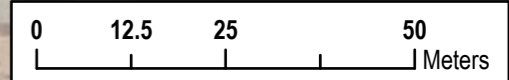
Punjab University

3484200

434600



	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



3484200

434600


3484400

CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	23 of 28	0

434400

3484600

434600

434400

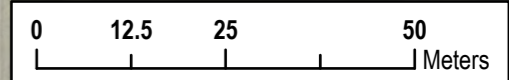


Punjab University

3484400



	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



434600

3484400

434800


434800

CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	24 of 28	0

434600

3484800

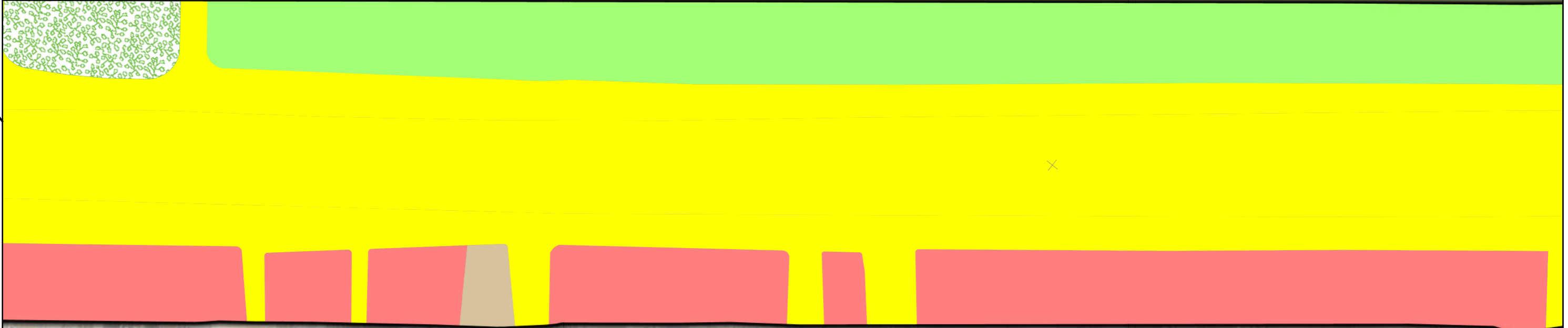


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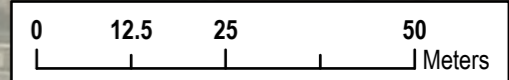
Punjab University

434600

3484600





	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road



434800

3484800

CLIENT

CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD
 HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

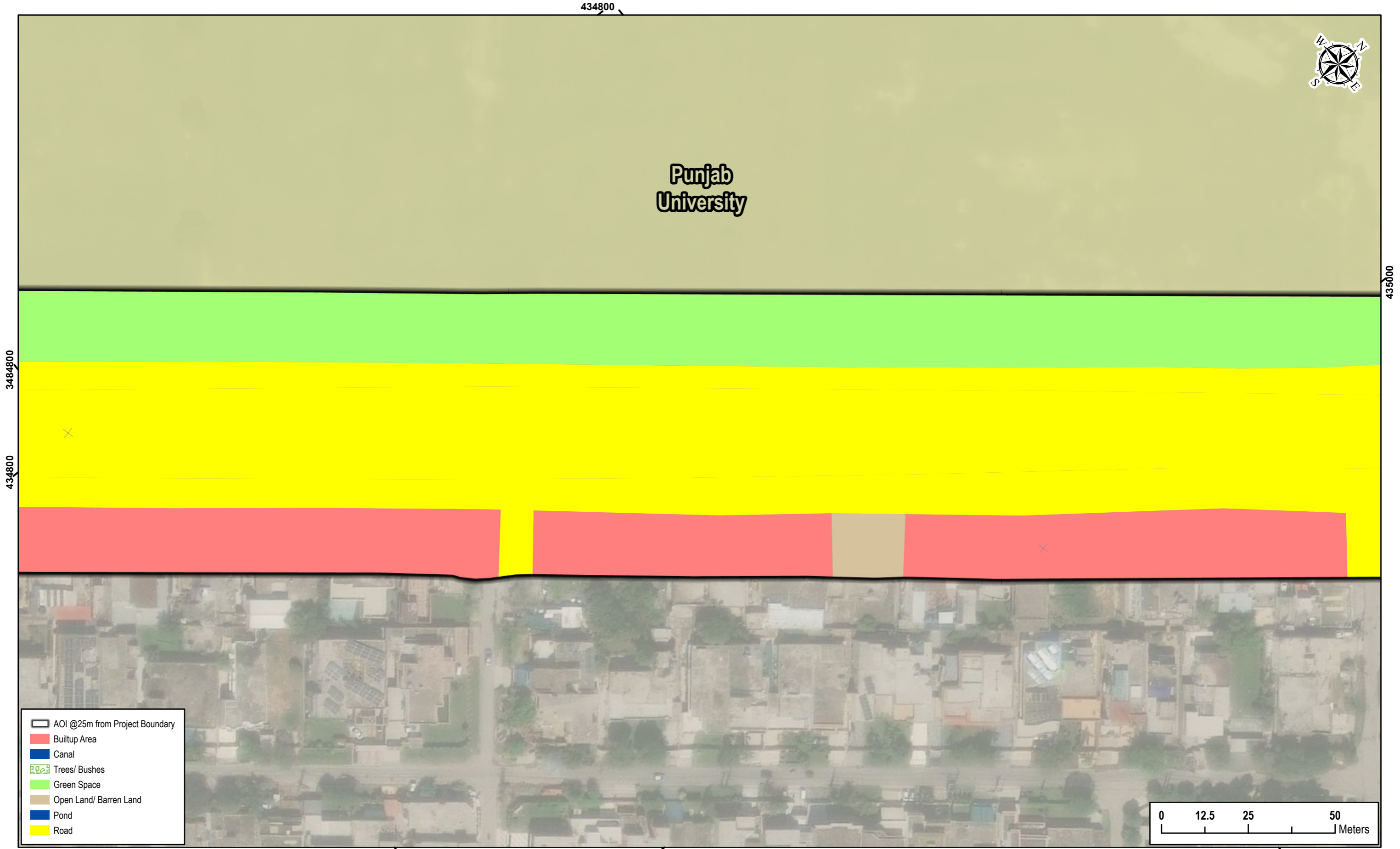
04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

PROJECT
SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

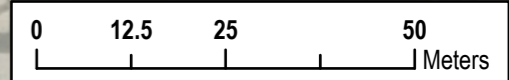
LANDUSE MAP		SCALE 1:1,000
DATE FEBRUARY-2024	DRAWING No. 25 of 28	REV. 0



Punjab University



	AOI @25m from Project Boundary
	Builtup Area
	Canal
	Trees/ Bushes
	Green Space
	Open Land/ Barren Land
	Pond
	Road

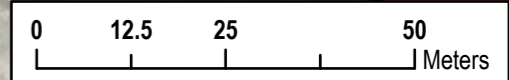


CENTRAL BUSINESS DISTRICT - (CBD)	CONSULTANT NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN	04				DRAWN	AMIR A.	PROJECT SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE	LANDUSE MAP		SCALE
		03				SUBMITTED	RIDHA		1:1,000		
		02				RECOMMENDED			DATE	DRAWING No.	REV.
		01				CHD/VER.			FEBRUARY-2024	26 of 28	0
		REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ				


Punjab University



- AOI @25m from Project Boundary
- Builtup Area
- Canal
- Trees/ Bushes
- Green Space
- Open Land/ Barren Land
- Pond
- Road




CLIENT



CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE ,1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04					DRAWN	AMIR A.
03					SUBMITTED	RIDHA
02					RECOMMENDED	
01					CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ	

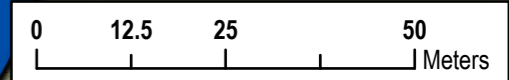
PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	27 of 28	0



- AOI @25m from Project Boundary
- Builtup Area
- Canal
- Trees/ Bushes
- Green Space
- Open Land/ Barren Land
- Pond
- Road



CLIENT

CENTRAL BUSINESS DISTRICT - (CBD)

CONSULTANT

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD

HEAD OFFICE:- NESPAK HOUSE, 1-C, BLOCK-N MODEL TOWN EXTENSION, LAHORE, PAKISTAN

04				DRAWN	AMIR A.
03				SUBMITTED	RIDHA
02				RECOMMENDED	
01				CHD/VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	M.SHARIQ

PROJECT

SIGNAL FREE CORRIDOR FROM BHEKEWAL MORE TO KALMA CHOWK, LAHORE

LANDUSE MAP		SCALE
		1:1,000
DATE	DRAWING No.	REV.
FEBRUARY-2024	28 of 28	0