

CONSTRUCTION OF INDUSTRIAL & AUTOMOTIVE CHAIN MANUFACTURING FACILITY BY M/S NICE CHAIN CO. PRIVATE LIMITED

**PLOT NO. 759, 760 AND 762 AT SUNDAR INDUSTRIAL
ESTATE, RAIWIND ROAD LAHORE**



ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT



Head Office: 218, Upper Mall Scheme, Lahore, Pakistan.

Tell Office: +92 42 37897273

Email: inenvconsultants@yahoo.com

Peshawar Office: Zaye Apartments, Main Warsak Road Peshawar.

Tell Office: +92 91 5202323

GLOSSARY

TERM	DEFINITION
Air Quality	Measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.
Alloys	A mixture or metallic-solid solution composed of two or more elements (e.g., brass, steel). Complete solid solution alloys give a single solid phase microstructure.
Aluminium	The most abundant metallic element in Earth's crust and the most widely used nonferrous metal.
Consultation	Two-way transfer of information or joint discussion between project staff and the affected population to improve project outcomes and participation.
Coordinates	A group of numbers used to indicate the position of a point, line, or plane.
Contaminate	To make impure or to pollute.
Cyclone	Separation devices (dry scrubbers) that use inertia to remove particulate matter (larger pieces) from flue gases as a pre-cleaner.
Environmental Management	Attempting to control human impact on and interaction with the environment to preserve natural resources.
Land Acquisition	The process whereby a person is compelled by a public agency to cede land for public purpose in return for compensation.
Mitigation	The action of reducing the severity, seriousness, or painfulness of something.
Monitoring	Supervising activities in progress to ensure they remain on-course and on-schedule to meet objectives.
Production Capacity	The volume of products or services that can be produced by an enterprise using current resources.
Proponent	A person or entity who advocates a theory, proposal, or course of action.
Rehabilitation	Compensatory measures to re-establish lost incomes, livelihoods, and social systems (excludes compensation for assets).
Resettlement	Measures taken to mitigate adverse impacts on livelihood and property, including compensation, relocation, and rehabilitation.
Stakeholders	Affected persons and communities, proponents, private and public businesses, NGOs, and the EPA.
Ton	A unit of gross internal capacity, equal to 100 cubic feet (2.83 cubic meters).
Topography	Details of the surface features of land, including mountains, hills, creeks, and other geographic variations.

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EXECUTIVE SUMMARY

This report presents the Initial Environmental Examination (IEE) for the Construction of an Industrial & Automotive Chain Manufacturing Facility by M/S Nice Chain Co. Private Limited. located at Plot No. 759, 760 and 762 at Sundar Industrial Estate, Raiwind Road Lahore with a total area of 6.5 Kanal site, this project involves an investment of PKR 250 million to establish a high-capacity production unit capable of manufacturing 3 million units annually, including motorcycle, industrial roller, agricultural, and conveyor chains. The facility integrates a comprehensive production workflow featuring cutting, stamping/punching, heat treatment, shot blasting, assembly, lubrication, testing, and packing.

The project requires a thorough evaluation of environmental impacts associated with metal processing, heat treatment furnaces, and the use of industrial oils and grease. In compliance with the Punjab Environmental Protection Act, this study identifies potential risks and proposes a robust Environmental Management Plan (EMP) to mitigate impacts related to waste disposal, air emissions, and resource consumption. By adhering to these regulatory standards, the facility aims to ensure sustainable industrial growth and operational safety while meeting the growing market demand for high-quality chain products.

The EIA study identifies and evaluates potential environmental impacts during both the construction and operational phases. It proposes comprehensive mitigation measures such as advanced wastewater treatment, sterile waste disposal protocols, and air quality monitoring for the production sections integrated into a detailed Environmental Management Plan (EMP). By ensuring the facility operates in full compliance with all relevant provincial environmental standards and industrial safety regulations, this report confirms that the plant will support the long-term demand for high-quality chain products in the region while maintaining operational safety and ecological integrity.

Project Need

The construction of this Industrial & Automotive Chain Manufacturing Facility by M/S Nice Chain Co. Private Limited. is essential to meet the escalating domestic demand for high-quality power transmission components in Pakistan. Driven by the need for localized production of durable industrial and automotive parts, this project is designed to provide a stable, high-capacity supply of motorcycle, industrial roller, agricultural, and conveyor chains.

By implementing a specialized layout that features advanced metal working machinery including heat treatment furnaces and automated assembly lines, the project will significantly improve the availability of reliable, high-grade chain products. Beyond technical optimization, this significant industrial investment of PKR 250 million will stimulate the local economy, support manufacturing-related supply chains, and reduce reliance on imported or substandard mechanical components. This project underscores a commitment to environmentally responsible industrial management, utilizing a comprehensive Environmental Management Plan (EMP) to provide a sustainable foundation for the region's industrial growth.

I. Objectives of the Project

The main objectives for the Industrial & Automotive Chain Manufacturing Facility by M/S Nice Chain Co. Private Limited. are outlined below:

- **Establish a high-capacity production system** to meet the growing domestic demand for durable motorcycle, industrial, agricultural, and conveyor chains.
- **Ensure high-quality output** through the installation of specialized machinery, including heat treatment furnaces, power presses, and automated assembly and testing lines.
- **Optimize industrial infrastructure** by utilizing a 6.5 Kanal site to house an integrated manufacturing workflow, from raw material processing to final product packing.
- **Comply with environmental regulations** by adhering to the Punjab Environmental Protection Act and implementing a robust Environmental Management Plan (EMP) throughout the construction and operational phases.
- **Maintain strict quality standards** by employing rigorous testing protocols for all manufactured chain units to ensure safety and product reliability.
- **Promote regional industrial growth** by investing PKR 250 million in the local manufacturing sector, supporting supply chains and economic development.
- **Minimize the environmental footprint** of metal processing and surface finishing operations through sustainable waste management practices for industrial oils, grease, and metal byproducts.

II. Environment Category of the Project

Based on the Punjab Environmental Protection Act, 2012 and the Review of IEE & EIA Regulations, 2022 for filing, reviewing, and approving environmental assessments, the present project is classified under Schedule II class B (20) **manufacturing and processing**. This regulatory framework ensures that the project is developed and implemented in a socially, economically, and environmentally sustainable manner.

III. Title and Location of the Project

Name of the Project: Construction of Industrial & Automotive Chain Manufacturing Facility by M/S Nice Chain Co. Private Limited.

Address: Plot No. 759, 760 And 762 at Sundar Industrial Estate, Raiwind Road Lahore.

Google Coordinates:

Google coordinates of the project site are as follows:

Latitude	31°16'30.1"N
Longitude	74°11'02.5"E

Construction of Industrial & Automotive Chain Manufacturing Facility
M/s Nice Chain Co. Private Limited.
Environmental Impact Assessment (EIA)

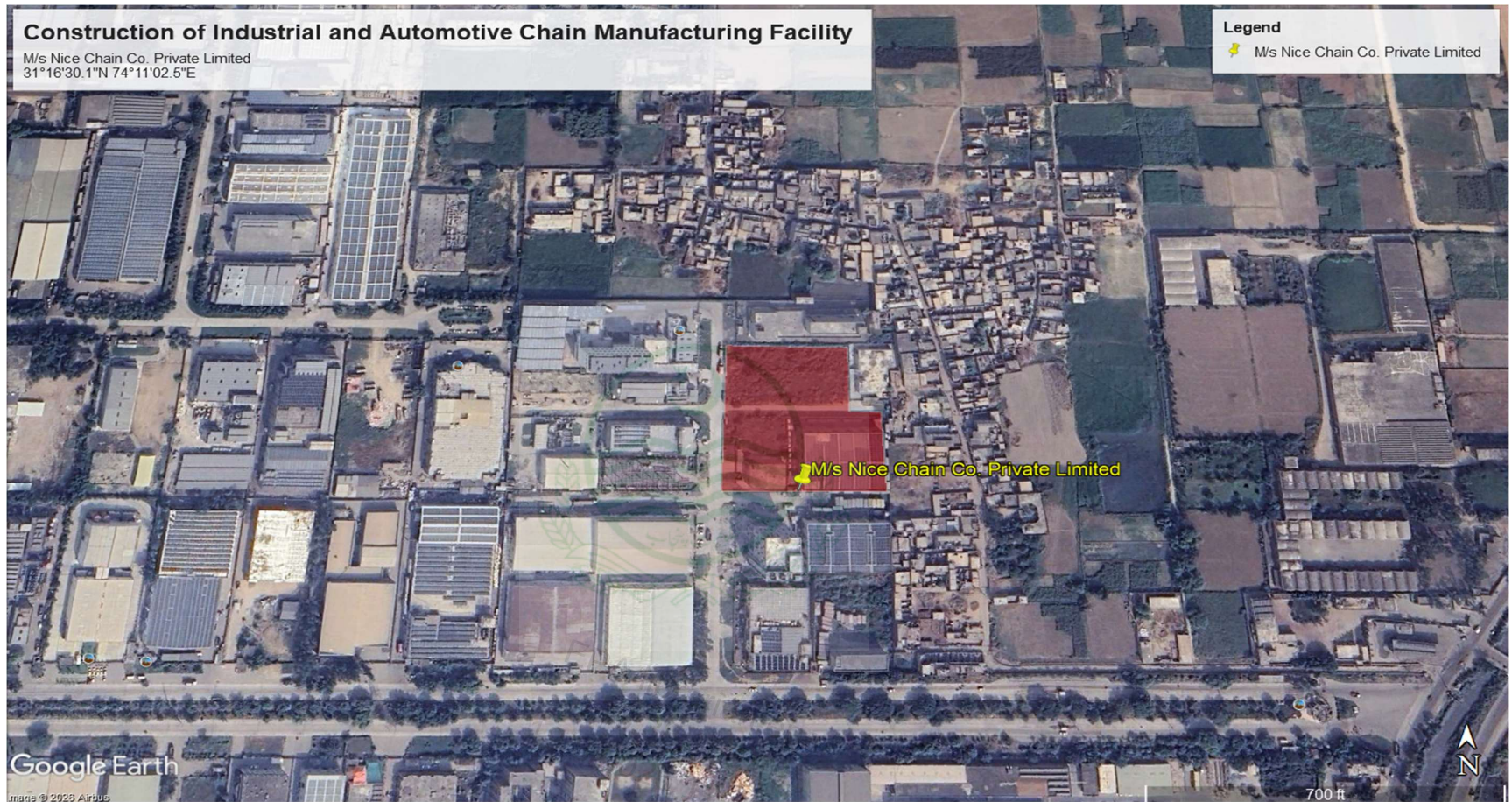


Figure 0-1: Location Map

IV. Name of Organization Preparing the Report

Integrated Environment Consultants

Head Office: 218, Street No. 5 Upper Mall Scheme Lahore

Phone: (042)-37897273

Email: inenvconsultants@yahoo.com

V. Name of the Proponent

Name: Khalid Rafat Chishti

Address: House No. 317, Block no. 4, sector A 2, Township Lahore.

VI. Brief outline of the Proposal

The proposed project involves the construction and operation of an integrated manufacturing facility by M/s Nice Chain Co. Private Limited. dedicated to the production of high-quality industrial and automotive chains. The facility will produce motorcycle, industrial roller, agricultural, and conveyor chains using an end-to-end manufacturing process, including cutting, stamping/punching, heat treatment, shot blasting, assembly, and testing. The company is committed to conducting business in accordance with best industrial practices and environmental safety standards.

<u>BRIEF OUTLINE OF THE PROJECT</u>	
Land Available	6.5 kanal
Project Estimated Cost	250 Million Rupees
Raw Material for industrial and automotive chain manufacturing	♦ Alloy Steel, ♦ Lubricating Oil, ♦ Grease, ♦ Quenching Oil ♦ Steel Strip
Capacity of the Project	10,000 units/day (3 Million units/year)

VII. Project Impacts and Recommendations for their Mitigation

Table 1 shows the project impacts; related with construction and operation and accordingly mitigation measures have also been proposed to safeguard the environment and for sustainable development.

Table 0-1: Project Impacts and their Mitigations Measure

Screening of possible Impacts during Design/Pre- Construction phase

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
1	Inadequate site drainage	Unlikely	Moderate	Medium	Long

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
	design leading to future waterlogging				Term
2	Improper zoning compliance for industrial activity	Rare	Major	High	Long Term
3	Omission of fire safety protocols in the facility design	Unlikely	Major	Medium	Long Term
4	Lack of detailed Waste Management Plan (WMP) for operations	Likely	Moderate	Medium	Long Term
5	Inefficient layout increasing energy demand and resource usage	Likely	Minor	Low	Long Term
6	Inaccurate assessment of raw material storage safety requirements	Unlikely	Moderate	Medium	Long Term

Screening of possible Impacts during Construction phase

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
1.	Dust generation from site preparation and earthworks	Likely	Moderate	Medium	Short Term
2.	Noise pollution from heavy machinery and construction activity	Likely	Minor	Low	Short Term
3.	Improper disposal of construction debris and waste materials	Unlikely	Moderate	Medium	Long Term
4.	Traffic congestion due to machinery mobilization and logistics	Likely	Minor	Low	Short Term
5.	Soil compaction and alteration of drainage patterns	Unlikely	Moderate	Low	Long Term
6.	Occupational safety risks to workers during structure assembly	Likely	Moderate	Medium	Short Term
7.	Accidental spills of fuel or construction-related chemicals	Unlikely	Major	Medium	Long Term

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
8.	Depletion of local water resources for construction needs	Possible	Minor	Low	Short Term
9.	Potential damage to existing site infrastructure/nearby utility lines	Rare	Major	Medium	Long Term
10	Loss of vegetation or site clearing impacts on local biodiversity	Unlikely	Minor	Low	Long Term
11	Socio-economic impacts on local labor/employment opportunities	Likely	Minor	Low	Short Term

Screening of possible Impacts during Operational Phase

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
1	Air emissions (particulate matter/fumes) from Heat Treatment furnaces	Likely	Moderate	Medium	Long Term
2	Soil and groundwater contamination from spent quenching oil/lubricants	Likely	Major	High	Long Term
3	Noise pollution generated from heavy-duty Power Presses and machinery	Likely	Moderate	Medium	Long Term
4	Hazardous waste generation (metal shavings, oily rags, contaminated grease)	Likely	Moderate	Medium	Long Term
5	Occupational health risks to staff from chemical/oil skin exposure or inhalation	Likely	Moderate	Medium	Short Term
6	Increased energy demand placing pressure on the industrial estate's grid	Possible	Minor	Low	Long Term
7	Wastewater effluent discharge containing suspended solids and oil traces	Possible	Moderate	Medium	Long Term
8	Fire hazards due to the storage of flammable materials (oils, grease, alloy steel)	Unlikely	Major	Medium	Short Term

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
9	High-temperature thermal discharge from shot blasting and heat treatment units	Possible	Minor	Low	Short Term
10	Traffic increase due to daily heavy logistics and product transport	Likely	Minor	Low	Long Term
11	Potential for accidental spills during bulk oil and chemical storage/transfer	Possible	Moderate	Medium	Long Term

VIII. Proposed Monitoring

The monitoring program for the M/S Nice Chain Co. Private Limited. facility is designed to ensure strict compliance with the environmental standards set by the Punjab-EPA. This Monitoring Plan (MP) provides essential data for effective environmental management, allowing for the continuous assessment of mitigation effectiveness throughout the construction and operational phases. Monitoring these key industrial and environmental parameters will ensure the project's adherence to the Punjab Environmental Quality Standards (PEQS) and industrial safety protocols.

Table 0-2: Proposed Monitoring Plan

Sr. No.	Monitoring Parameters	Monitoring Mechanism	Frequency	Responsibility
DURING INSTALLATION				
1.	Dust & Air Quality	Ambient Particulate Matter (PM ₁₀ and PM _{2.5}) monitoring at the project site.	Quarterly	Proponent & Contractor
2.	Noise Levels	Noise level meter testing to manage impact from heavy machinery mobilization.	Quarterly (3rd party)	Proponent & Contractor
3.	Soil Contamination	Visual inspection for fuel/oil spills from heavy earth-moving equipment.	Daily	Contractor HSE Officer
4.	HSE Plan	Inspection of PPE, site security, and industrial safety protocols.	Daily	Proponent & Contractor
5.	Waste Management	Logbook maintenance for construction debris and disposal of metal scrap.	Weekly	Contractor
DURING OPERATION				

Sr. No.	Monitoring Parameters	Monitoring Mechanism	Frequency	Responsibility
1.	Noise Levels	Monitoring of Power Press and Chain Assembly machine noise as per PEQS.	Quarterly (3rd party)	Proponent (Nice Chain Co.)
2.	Air Emissions	Monitoring of furnace exhaust and particulate matter from Shot Blasting units.	Quarterly	Proponent / EHS Team
3.	Oil & Grease Management	Testing of floor runoff and drainage for Quenching Oil and Lubricant traces.	Monthly	EHS/Production Team
4.	Furnace/Heat Safety	Inspection of Heat Treatment Furnace temperature controls and ventilation.	Daily	Production Manager
5.	Workplace Safety	Inspection of machinery guards, fire extinguishers, and emergency shut-offs.	Daily	EHS Officer
6.	Industrial Effluent	Testing of wash-water and industrial discharge for compliance with PEQS.	Quarterly	Proponent

IX. Environmental Management Cost

The cost for environmental management and monitoring will be an integral part of the contracts for the Contractor and Consultants. However, a lump sum amount has been allocated by the project proponent, M/S Nice Chain Co. Private Limited., to cover environmental training, monitoring, and compliance for the duration of the project's construction and operational phases. The following table outlines the estimated costs associated with ensuring the facility meets Punjab-EPA standards and industrial safety requirements within the framework of the PKR 250 million total project cost

Table 0-3: Environmental Management Cost

Sr. No.	Environmental Mitigation/Monitoring Item	Unit	Amount (PKR)
1	Air quality monitoring (Baseline + Construction Phase)	Per event	150,000
2	Noise level monitoring (Baseline + Construction + Operational)	Per event	150,000
3	Water quality testing (Industrial Effluent & Sanitary Discharge)	Per event	150,000
4	Soil & hazardous waste sampling (Oils, Grease, & Metal waste)	Per event	150,000

Sr. No.	Environmental Mitigation/Monitoring Item	Unit	Amount (PKR)
5	Development of Environmental Management Plan (EMP)	Lump sum	400,000
6	Implementation of EMP (Signage, Safety Barriers, Site Fencing)	Lump sum	350,000
7	Tree plantation & green belt development (Facility boundary)	Lump sum	250,000
8	Waste handling (Oil spill kits, specialized bins, scrap management)	Lump sum	250,000
9	Health & safety (HSE) training for factory staff & PPE	Per session	250,000
10	Emergency response & Fire safety (Fire suppression systems)	Lump sum	250,000
11	Third-party environmental audit & Compliance reporting	Per audit	150,000
Total	Estimated Environmental Management Cost		2,500,000

X. Stakeholder Consultations

Stakeholder consultations were conducted with the local industrial community and representatives within the vicinity of the proposed project site. The local industrial community and neighboring operators expressed a highly positive outlook toward the project, viewing the establishment of the M/S Nice Chain Co. Private Limited. manufacturing facility as a significant milestone that will enhance the domestic production of high-quality industrial and automotive chains. The local community and industrial operators observe significant positive impacts regarding the modernization of local manufacturing and the subsequent increase in the socio-economic value of the area through job creation and specialized industrial growth. The Environmental Impact Assessment (EIA) findings depict that the stakeholders perceive the project as a vital contribution to sustainable industrial development, with overall positive social and economic impacts. Stakeholders specifically appreciated the selection of the site, noting that its professional management and commitment to environmental and safety standards will ensure a reliable and safe supply of high-grade mechanical components to meet the growing industrial needs of the region.

XI. Conclusion

The study was conducted to assess the environmental aspects of establishing the M/S Nice Chain Co. Private Limited. manufacturing facility. All potential environmental impacts were identified through comprehensive site assessments, and robust mitigation measures have been proposed in accordance with the Punjab Environmental Protection Act, 1997 (Amended 2012) and the Review of IEE & EIA Regulations, 2022. Given the project baseline and proposed control measures, it is concluded that the construction and operation of the facility will significantly contribute to local industrial infrastructure without causing adverse impacts that cannot be managed through the Environmental Management Plan (EMP). The surrounding industrial community strongly supports the project, recognizing it as a vital contributor to the local supply of high-quality mechanical components and regional industrial growth.

1 INTRODUCTION

Reliable Sustainable industrial growth within the Punjab region necessitates strict adherence to the Punjab Environmental Protection Agency (EPA) guidelines to ensure that development remains ecologically sound and socially responsible. As industrial activity expands, the demand for high-quality, durable mechanical components specifically motorcycle, industrial, agricultural, and conveyor chains has increased significantly to support the broader manufacturing sector. The absence of localized, high-capacity infrastructure often leads to supply chain volatility, an over-reliance on imported materials, and structural instabilities that can impede regional economic progress. To address these critical market needs, M/S Nice Chain Co. Private Limited. has initiated a strategic project to establish a dedicated, modern manufacturing facility that bridges the gap between engineering innovation and local industrial requirements. The proposed facility is designed as a centralized production node, utilizing advanced manufacturing technologies including precision power presses, automated heat treatment furnaces, and state-of-the-art shot blasting units to ensure that all output meets rigorous performance and durability standards. Beyond its core production capabilities, the project is engineered to uphold the highest safety and environmental benchmarks, featuring comprehensive oversight systems to manage industrial effluents and resource consumption. By integrating a robust Environmental Management Plan (EMP) and strict quality control protocols, the facility is designed to minimize its ecological footprint while maximizing output. Through the establishment of this permanent industrial landmark, M/S Nice Chain Co. Private Limited. not only strengthens the local manufacturing supply chain but also reinforces Pakistan's commitment to sustainable industrial development under the regulatory framework of the provincial Environmental Protection Agency. In compliance with the legal requirement of Section-12 of Punjab Environment Protection Act-2012, the proponent is required to submit the Environmental Impact Assessment (EIA) report before the commencement of the proposed project, therefore, Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore.

1.1 Purpose of the Report

As per the Punjab Environmental Protection Act 1997 (Amended 2012), Section 12, which covers the filing of an Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA), no project proponent is permitted to commence construction or operational activities without submitting the requisite documentation to the designated Provincial Environmental Protection Agency. Given the technical scale and infrastructure requirements of the proposed M/S Nice Chain Co. Private Limited. facility, an Environmental Impact Assessment (EIA) is mandatory to identify and mitigate any potential adverse environmental or social effects. This is particularly critical due to the intensive nature of the proposed manufacturing processes, including the operation of advanced heat treatment furnaces and high-temperature metal processing, which necessitate proactive management to ensure emissions, energy use, and operational safety align with provincial environmental standards.

Consequently, official approval must be obtained from the Punjab Environmental Protection Agency (Punjab-EPA). This legal requirement, mandated by the Government of Punjab, necessitates the preparation of this comprehensive Environmental Impact Assessment (EIA) Report to secure the necessary Environmental Approval (EA) for the Construction of Industrial & Automotive chain Manufacturing Facility By M/s Nice Chain Co. Private Limited. At Plot No. 759, 760 And 762 at Sundar Industrial Estate, Raiwind Road Lahore.

This report provides detailed technical information and baseline data regarding the environmental, economic, and social parameters of the project. It serves as a formal justification that the manufacturing of industrial, automotive, agricultural, and conveyor chains by M/S Nice Chain Co. Private Limited. will comply with the principles of sustainable development. All activities during both the construction and operational phases will adhere to the requirements of the Punjab Environmental Quality Standards (PEQS), the Review of IEE and EIA Regulations 2022, and all other applicable rules and regulations enforced by the Government of Punjab, alongside the relevant industrial safety mandates.

1.2 Objectives of the Project

The primary objective of this project is to establish a high-capacity manufacturing facility for M/S Nice Chain Co. Private Limited. to ensure a reliable supply of premium-quality industrial and automotive chains. This facility aims to strengthen the local industrial supply chain, reduce dependency on imported mechanical components, and foster long-term growth in the regional engineering sector.

The project fulfills the following core functions:

- **High-Standard Production:** Utilize advanced manufacturing technologies, including precision power presses, heat treatment furnaces, and shot blasting units, to meet demanding industrial quality standards.
- **Operational Efficiency:** Minimize waste and improve durability through modern, automated production lines and standardized engineering processes.
- **Regulatory Compliance:** Operate in full accordance with the Punjab Environmental Protection Agency guidelines and provincial safety mandates.
- **Industrial Benchmark:** Establish a model for precision manufacturing in the region, promoting ISO compliance and technical excellence.
- **Socio-Economic Impact:** Enhance the regional industrial footprint by creating specialized employment opportunities and supporting the localized development of the manufacturing sector.

By achieving these objectives, the project will ensure the provision of high-performance mechanical parts, eliminate technical instabilities associated with substandard production, and bolster investor confidence in the region's industrial infrastructure.

1.3 Scope of Work

In order to address the growing industrial demands and infrastructure requirements for high-precision metal manufacturing, the project titled "Establishment of M/S Nice Chain Co. Private Limited. Manufacturing Facility" has been initiated with the following key components:

- **Procurement and Installation of Modern Production Lines:** Featuring specialized equipment for the high-precision production of motorcycle, industrial, agricultural, and conveyor chains, utilizing advanced power presses and automated assembly lines.
- **Construction of Civil Infrastructure on a 6.5 kanal Site:** Development of a comprehensive facility with a total footprint of approximately 6.5 Kanals, including dedicated production halls, specialized heat treatment furnace sections, and organized storage for raw steel and finished products.

- **Installation of Advanced Thermal Processing Systems:** Utilizing high-capacity, automated heat treatment furnaces designed to achieve the required hardness and durability standards for high-performance chain components.
- **Development of Supporting Infrastructure:** Including specialized surface treatment areas, modern quality control laboratories equipped for mechanical stress testing, and efficient material handling zones for industrial processing.
- **Establishment of Utility and Safety Systems:** Installation of heavy-duty electrical infrastructure, robust ventilation and air handling systems for the furnace areas, and specialized industrial drainage systems to manage manufacturing-related effluents.
- **Implementation of Environmental and Safety Mitigation Measures:** Development of internal green belts for site aesthetics, specialized containment areas for chemical treatment agents, and rigorous safety protocols for operating high-temperature furnaces and heavy machinery.
- **Training of Operational Staff:** Specialized training on industrial manufacturing techniques, furnace operation safety, clean-processing protocols, emergency response for high-temperature handling, and routine maintenance in strict compliance with ISO 9001:2015 standards and provincial regulations.

A comprehensive site layout plan has been developed for the facility, based on the industrial estate's master plan, technical engineering requirements, and environmental safety considerations. The manufacturing flow is designed to ensure maximum efficiency from raw material intake to final dispatch, minimizing production waste and ensuring product integrity. The overall design integrates the manufacturing floors with automated monitoring systems to ensure a reliable, safe, and continuous supply of high-strength industrial components in an environmentally responsible manner

1.4 Environment Category of the Project

Based on the Punjab Environmental Protection Act, 2012 and the Review of IEE & EIA Regulations, 2022 for filing, reviewing, and approving environmental assessments, the present project is classified under Schedule II class B (20) **manufacturing and processing**. This regulatory framework ensures that the project is developed and implemented in a socially, economically, and environmentally sustainable manner. Following list shows the projects included in Class B.

B. Manufacturing and Processing

1. Cement plant
2. Chemical manufacturing units, including pharmaceuticals and cosmetic
3. Sugar mills and Distilleries
4. Food processing industries including, beverages, milk and dairy products with total cost more than Rs 200 million
5. Paper and paperboard, paper pulping, paints and dyes,
6. Textile units comprising of dyeing & printing
7. Pesticides and fertilizer manufacturing units
8. Poultry waste processing units / rendering units
9. Tannery and leather units
10. Rubber projects with total cost more than Rs. 100 million

11. Battery Manufacturing and Recycling Plants
12. Ceramics and glass units
13. Electro plating and nickel/chrome plating including Surgical Units
14. Cutlery units
15. Slaughter House
16. Iron and steel rolling mills
17. Steel Furnaces
18. Smelting plants
- 19. Auto mobile manufacturing and assembling units**
20. Resource Recovery Unit

1.5 Objectives of the EIA Report

The primary objective of this Environmental Impact Assessment (EIA) study is to evaluate the potential environmental and social impacts associated with the establishment and operation of the M/S Nice Chain Co. Private Limited. manufacturing facility. This study ensures that critical environmental and social considerations are seamlessly integrated into the planning, design, construction, and operational phases of the project. By doing so, it establishes a robust framework for managing impacts through systematic mitigation, continuous monitoring, and institutional coordination in line with provincial regulations.

The more specific objectives of this EIA study are to:

- **Facilitate the Project Proponent** in ensuring the environmental, technical, and social sustainability of the industrial and automotive chain manufacturing infrastructure.
- **Establish a Detailed Baseline** of the existing physical (soil, noise, air), biological (local flora), and socio-economic conditions within the 6.5 kanal project site and the surrounding industrial area.
- **Identify and Evaluate Significant Impacts** that may arise during all phases of the project lifecycle, including facility construction, installation of high-temperature heat treatment furnaces, and long-term manufacturing operations.
- **Recommend Mitigation Measures** to avoid or minimize potential risks such as thermal emissions, industrial effluent discharge, and noise from heavy-duty machinery, while enhancing the positive socio-economic effects of localized manufacturing.
- **Ensure Meaningful Stakeholder Consultation** by engaging with neighboring industrial operators and local authorities, incorporating their feedback into the final project design and safety protocols.
- **Provide a Comprehensive Environmental Management Plan (EMP)** to guide the implementation of mitigation measures, define monitoring responsibilities, and outline capacity-building needs for technical staff to ensure total environmental compliance with Punjab-EPA standards.

1.6 Proponent of the Project

Name: Khalid Rafat Chishti

Address: House No. 317, Block no. 4, sector A 2, Township Lahore.

1.7 Title and Location of the Project

Title: Construction of Industrial & Automotive Chain Manufacturing Facility by M/S Nice Chain Co. Private Limited.

Location: Plot No. 759, 760 And 762 at Sundar Industrial Estate, Raiwind Road Lahore.

1.8 Details of Consultant

Integrated Environment Consultants

Head Office: 218, Street No. 5 Upper Mall Scheme Lahore

Phone: (042)-37897273

Email: inenvconsultants@yahoo.com

1.9 Brief Description of Nature, Size and Location of project

The proposed project involves the installation of a high-precision manufacturing unit by M/S Nice Chain Co. Private Limited., located at its designated site within the Sundar Industrial Estate, Raiwind Road, Lahore. The facility occupies a total area of approximately 6.5 Kanals. M/S Nice Chain Co. Private Limited. will conduct operations using industry-best practices for the manufacturing of industrial and automotive chains, including motorcycle, agricultural, and conveyor systems. The production capacity is strategically designed to meet growing market demand for high-strength mechanical components through the integration of the following core machinery:

- **Automated Power Presses:** High-tonnage machinery utilized for the precision stamping and forming of chain plates and components.
- **High-Capacity Heat Treatment Furnaces:** Advanced thermal processing units designed to achieve the required hardness, durability, and tensile strength standards for all chain products.
- **Automated Assembly Lines:** Integrated systems for the efficient, high-speed assembly and linking of chain components to ensure consistent product quality.
- **Surface Treatment and Finishing Units:** Specialized equipment for the cleaning, coating, and rust-proofing of finished chains to enhance longevity and corrosion resistance.
- **Quality Control and Testing Apparatus:** Specialized laboratory equipment, including mechanical stress-testing machines and hardness testers, to ensure compliance with international industrial standards.

1.10 Approach and Methodology

The detailed approach and methodology used for this Environmental Impact Assessment (EIA) study involved a systematic and comprehensive review of technical guidelines, environmental baseline data, and industrial manufacturing reports. The process was designed to ensure that the establishment of the M/S Nice Chain Co. Private Limited. facility aligns with both rigorous engineering requirements and environmental safeguards. This included:

- (a) **Review of Legislative Framework:** An in-depth analysis of the Punjab Environmental Protection Act 1997 (Amended 2012), the Review of IEE & EIA

Regulations 2022, and the applicable Punjab Environmental Quality Standards (PEQS) to ensure total legal compliance for the industrial manufacturing sector.

- (b) Spatial and Land Use Analysis:** Detailed analysis of satellite imagery and topographic surveys to assess the land-use patterns of the 6.5 kanal project site and the surrounding units, ensuring the site meets required industrial safety and operational buffers.
- (c) Socio-Economic Assessment:** Examination of regional demographic data, local labor availability, and industrial records to understand the socio-cultural baseline of the beneficiary community and the local workforce.
- (d) Comparative Technical Review:** Reference to similar EIA reports for high-temperature metal processing and precision component manufacturing facilities within the Punjab region to identify proven mitigation strategies and best practices for thermal, air, and solid waste management.

Both published and unpublished data sources were utilized to collect site-specific information on the physical (soil, air, noise), biological (local flora), and socio-economic environment of the project area. This multi-layered methodology ensures that the findings of this report are based on verifiable data and professional environmental and engineering standards.

1.11 Review of Environmental Laws and Institutional Requirements

The project is required to comply with all applicable national as well as international environmental policies, laws, guidelines, acts and legislations.

1.12 Impact Assessment and Mitigation Measures

A logical and systematic approach was adopted for the identification and assessment of potential impacts associated with the establishment of the M/S Nice Chain Co. Private Limited. manufacturing facility. The process began during the screening phase and continued through technical scoping, which allowed the study team to pinpoint key environmental and social issues and classify them based on their significance to the industrial and local community.

Identification of potential impacts analyzed in terms of their nature, magnitude, spatial extent, and duration was carried out with precision. These impacts were directly correlated to the project's specific lifecycle stages, including:

- **Design Phase:** Site selection at the 6.5 kanal facility and equipment specifications, such as the high-capacity heat treatment furnaces and specialized metal processing machinery.
- **Construction Phase:** Mobilization of heavy industrial machinery, civil works for the production halls, and facility foundation works.
- **Operational Phase:** Long-term effects of high-precision manufacturing, including metal-related effluent management, industrial waste disposal, and noise from heat treatment utility systems and ventilation equipment.

Based on impact prediction modeling and the outcomes of stakeholder consultations with the surrounding industrial community, the study team screened the adverse environmental and social impacts to develop targeted mitigation measures. Detailed matrices were utilized to evaluate temporal impacts, while spatial overlays were used to assess the project's footprint relative to the neighboring industrial units. This rigorous evaluation ensures that all identified risks, ranging from high-temperature process

safety to wastewater discharge, are addressed within the Environmental Management Plan (EMP), prioritizing the safety and well-being of the local environment and workforce.

1.13 Environmental Management Plan (EMP)

A logical and systematic approach was adopted for the development of the Environmental Management Plan (EMP) for the M/S Nice Chain Co. Private Limited. manufacturing facility. The process began during the screening phase and continued through technical scoping, which allowed the study team to pinpoint key environmental and social issues and classify them based on their significance to the industrial and local community.

- **Identification of potential impacts** analyzed in terms of their nature, magnitude, spatial extent, and duration was carried out with precision. These impacts were directly correlated to the project's specific lifecycle stages, including:
- **Design Phase: Site selection at the 6.5 kanal** facility and equipment specifications, such as the high-capacity heat treatment furnaces and specialized metal processing machinery.
- **Construction Phase:** Mobilization of heavy industrial machinery, civil works for the production halls, and facility foundation works.
- **Operational Phase:** Long-term effects of high-precision manufacturing, including metal-related effluent management, industrial waste disposal, and noise from heat treatment utility systems and ventilation equipment.

Based on impact prediction modeling and the outcomes of stakeholder consultations with the surrounding industrial community, the study team screened the adverse environmental and social impacts to develop targeted mitigation measures. Detailed matrices were utilized to evaluate temporal impacts, while spatial overlays were used to assess the project's footprint relative to the neighboring industrial units. This rigorous evaluation ensures that all identified risks, ranging from high-temperature process safety to wastewater discharge, are addressed within the Environmental Management Plan (EMP), prioritizing the safety and well-being of the local environment and workforce.

1.14 Environmental Monitoring Plan

An Environmental Monitoring Plan (EMnP) has been designed to systematically evaluate the execution and efficacy of the proposed mitigation measures across all phases of the project's lifecycle. The core objective of this plan is to ensure strict adherence to the Punjab Environmental Protection Act. The EMnP establishes a structured framework for routine testing, data collection, and reporting regarding key environmental indicators including ambient air quality, industrial stack emissions, noise levels, and solid/liquid waste management. By implementing these regular monitoring protocols, the facility can proactively identify potential environmental deviations, verify the operational efficiency of pollution control devices, and implement prompt corrective actions to minimize the project's overall ecological footprint.

1.15 Structure of Report

This report contains the following ten chapters:

- **Chapter 1– “Introduction”** describes introduction, location of project, objective and purpose of the EIA report.

- **Chapter 2–“Screening of the project”** describes the process of categorizing the project to determine the level of environmental assessment required by law.
- **Chapter 3–“Scoping of the project”** identifies the specific environmental issues and boundaries that need to be prioritized and analyzed within the study.
- **Chapter 4 – Analysis of Project Alternatives”** discusses the available options and selection of the most suitable options based on specific criteria.
- **Chapter 5 – “Project Description”** provides an overall project description, including its background, features and key components, timeframe and costs.
- **Chapter 6– “Description of the Environment”** comprises a detailed narrative of the existing (baseline) conditions of the project area, with respect to its physical, biological and socio-economic environment.”
- **Chapter 7– “Anticipated Environmental Impacts & Mitigation Measures”** elaborates the likely impacts of the project on the physical, biological and socio-economic environment during the construction and operation stages and lays down the proposed measures to mitigate the adverse impacts of the project.
- **Chapter 8 – “Environmental Management Plan and Institutional Requirements”** provides the mechanism to be adopted for the implementation of measures and monitoring the environment during all stages.
- **Chapter 9 – “Public Consultation and Information Disclosure”** provides a summary of consultative sessions with the local community as well as with other stakeholders, including local government officials for their opinions and suggestions on the project.
- **Chapter 10– “Conclusion and Recommendations”** gives the conclusion of the EIA study and recommendations for the construction and operational stages.

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2 SCREENING OF THE PROJECT

Based on the Punjab Environmental Protection Act, 2012 and the Review of IEE & EIA Regulations, 2022 for filing, reviewing, and approving environmental assessments, the present project is classified under Schedule II class B (20) **manufacturing and processing**. This regulatory framework ensures that the project is developed and implemented in a socially, economically, and environmentally sustainable manner. Following list shows the projects included in Class B.

C. Manufacturing and Processing

1. Cement plant
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14. Cutlery units
15. Slaughter House
16. Iron and steel rolling mills
17. Steel Furnaces
18. Smelting plants
- 19. Auto mobile manufacturing and assembling units**
20. Resource Recovery Unit

M/s Nice Chain Co. Private Limited. necessitates the preparation of an Environmental Impact Assessment (EIA) due to the scale and complexity of their operations, as well as the potential environmental and health risks associated with industrial metal manufacturing and high-temperature thermal processes. Given the stringent regulatory requirements governing environmental protection, industrial safety, and public health, an EIA is essential to evaluate the project's impacts on air, water, soil, and surrounding communities. Furthermore, the EIA ensures that appropriate mitigation measures are identified and implemented during the design, construction, and operational phases. It also facilitates informed decision-making and encourages public participation, thereby promoting transparency, sustainability, and compliance with the Punjab Environmental Protection Act, 1997 (Amended 2012).

3 SCOPING OF THE PROJECT

The scoping process outlines the essential concerns and impacts requiring detailed investigation. It establishes the spatial and temporal limits, crucial concerns raised during consultations, and significant impacting factors impacting the project.

3.1 Spatial and Temporal Boundaries of Environmental Assessment

Considering spatial and temporal boundaries in environmental assessments is vital to comprehensively evaluate the impact of a project. Spatial boundaries define the area affected, aiding in recognizing the extent of impact on ecosystems and nearby communities. Temporal boundaries assess short and long-term effects, enabling an understanding of how impacts evolve over time and helping in planning mitigation measures and long-term sustainability strategies. This approach ensures accurate, detailed assessments and effective addressing of potential environmental consequences related to the project. The proposed M/s Nice Chain Co. Private Limited. project is located at its designated site within the Sundar Industrial Estate, Raiwind Road, Lahore, where these boundaries have been established to cover all direct and indirect operational influences.

The proposed project site has existed in industry zone where all facilities are available. The Google coordinates of the project are as followings:

Latitude	31°16'30.1"N
Longitude	74°11'02.5"E

3.2 Important issues and concerns raised during consultation

The EIA for the M/S Nice Chain Co. Private Limited. project incorporated a two-stage consultation process, primarily focused on one-on-one meetings. In the initial stage, the consultation was specifically directed towards engaging local government authorities, neighboring industrial operators within the estate, and relevant stakeholders. The primary goal of this stage was to evaluate both the short-term and long-term impacts that might result from the new industrial development in its early stages. The intent was to gather insights and perspectives from key stakeholders in the immediate vicinity to better understand the potential environmental, social, and economic implications of metal manufacturing and furnace operations.

The second stage of consultations, as indicated, will be conducted through a more extensive process of public participation if deemed necessary. This broader involvement will allow for a wider outreach, enabling a more comprehensive engagement to gather additional feedback, concerns, and insights from a larger cross-section of the community, including workers and nearby facility managers. This will ensure a more inclusive approach, providing an opportunity for a wider range of stakeholders to contribute their perspectives, concerns, and suggestions, which can be valuable in shaping and refining the EIA for the proposed industrial facility.

3.3 Significant impacts and factors to be determined

In the M/s Nice Chain Co. Private Limited. manufacturing facility, the determination of significant impacts involves a thorough assessment of environmental, occupational, and operational risks associated with metal processing, thermal treatment, and industrial manufacturing processes. Key factors to be considered include:

- **Environmental Emissions:** The potential for air pollution from furnace exhaust, particulate matter from metal cutting, and the management of industrial wastewater and oily effluents.
- **Resource Consumption:** Efficient monitoring of high-energy consumption required for heat treatment furnaces and the sustainable usage of water resources during cooling and cleaning processes.
- **Waste Management:** Proper handling, storage, and disposal of hazardous waste (such as spent quenching oils and chemical treatment sludge) and non-hazardous industrial scrap.
- **Occupational Health and Safety:** Risks to workers due to exposure to high-temperature furnace operations, mechanical hazards from heavy-duty machinery, and noise pollution from high-speed production lines.
- **Community and Infrastructure:** Impacts on local air quality, traffic flow within the industrial estate, and the capacity of local infrastructure to support facility operations.
- **Emergency Preparedness:** Development of robust emergency response plans for accidental spills, fires, or mechanical failures, ensuring adherence to industrial safety standards.

Identifying and mitigating these risks is essential for protecting human health, minimizing environmental degradation, and achieving full regulatory compliance with Punjab Environmental Quality Standards (PEQS) throughout the lifecycle of the industrial unit.

3.4 Development of an Environmental Management Plan

The Environmental Management Plan (EMP) for the M/s Nice Chain Co. Private Limited. facility is a crucial document, as it outlines strategies to mitigate environmental impacts, ensures regulatory compliance, guides project operations, promotes sustainability, reduces industrial risks, assures stakeholders, and allows for ongoing improvement and adaptation to address environmental concerns throughout the project's lifecycle.

The key components of this EMP include:

- **Project Description:** A clear overview of the industrial and automotive chain manufacturing infrastructure and its operational scope.
- **Impact and Risk Outline:** A detailed identification of potential environmental impacts, including furnace emissions, industrial waste, and noise pollution.
- **Mitigation Measures:** Specific strategies tailored to address identified impacts, such as advanced air filtration for furnace exhaust and containment systems for chemical effluents.
- **Monitoring and Reporting:** A comprehensive system to track environmental indicators to ensure continued compliance with Punjab Environmental Quality Standards (PEQS).
- **Emergency Response and Contingency Planning:** Robust protocols for managing accidental spills, mechanical failures, or fire hazards related to high-temperature metal processing.
- **Stakeholder Engagement:** Clearly defined communication strategies for ongoing interaction with local authorities and neighboring industrial operators.

- **Review and Adaptive Framework:** A structure for the regular review and updating of the EMP to ensure its adaptability and effectiveness as the facility's production capacity evolves.

Together, these components form a comprehensive EMP designed to guide environmental practices at the M/s Nice Chain Co. Private Limited. site, minimize adverse effects, and maintain strict adherence to provincial environmental regulations and best industry practices.



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4 ALTERNATIVES OF THE PROJECT

The alternatives for the proposed project and their relative potential impacts on the environment were considered to evaluate the best project option. The following alternatives were considered for the project.

Project Alternatives

- No project option/worst scenario option.
- Site Alternative
- Technology Alternative

4.1 No Project Option / Worst Scenario Option

Analysis

Strengths and Opportunities

If the proposed manufacturing unit by M/S Nice Chain Co. Private Limited. is not established at the designated site within the Sundar Industrial Estate, Lahore, various resources including financial investments, time, and human effort will be preserved. These resources could be redirected toward other ventures of the proponent. There will be no requirement for intensive site development on the 6.5 Kanal plot, thus avoiding any potential localized inconvenience to neighboring industrial units. Additionally, environmental disturbances associated with construction and installation activities such as noise from foundation works, fugitive dust emissions, and temporary traffic congestion on estate roads will be completely avoided. The absence of a new industrial operation also means no risk of industrial emissions, wastewater generation, or other environmental stresses on the local air and groundwater quality. The status quo of the Sundar Industrial Estate area will remain undisturbed, and the existing ecological and social equilibrium will be maintained.

Weaknesses and Threats

However, not proceeding with the manufacturing unit by M/S Nice Chain Co. Private Limited. carries considerable disadvantages. The Sundar Industrial Estate and the surrounding Lahore region would miss out on significant socio-economic benefits, such as direct and indirect employment opportunities, technical skill development for the local workforce, and overall industrial growth. Local vendors and service providers would also lose potential business prospects associated with the specialized supply chain of the industrial and automotive chain industry, including raw material logistics and technical maintenance services. Additionally, the region's capacity to locally produce and supply high-strength industrial components would be limited, potentially increasing dependence on other regions for critical mechanical parts. This could affect supply chain stability, increase procurement costs, and reduce the overall competitiveness of the provincial industrial sector. The opportunity to promote environmentally responsible industrial growth through strict compliance with modern Punjab EPA safety standards including the implementation of advanced waste management and efficient resource utilization would also be forfeited.

Conclusion

The "No Project Option" suggests that not establishing the proposed manufacturing unit at the Sundar Industrial Estate will result in missed opportunities for local economic uplift, technical job creation, and the regional supply of high-quality industrial components. While this option avoids potential environmental risks associated with industrial operations in the short term, it also prevents sustainable industrial

development and the implementation of modern environmental safeguards within the area. Thus, the "No Project Option" is not recommended for this project.

4.2 Site Alternatives

The proponent's land has been carefully chosen due to its proximity to existing infrastructure and logistical convenience. The site for the M/S Nice Chain Co. Private Limited. facility within the Sundar Industrial Estate has already undergone thorough assessments and is deemed suitable in terms of safety, environmental impact, and compliance with Punjab EPA regulations. The proponent's land is already owned, eliminating the need for additional land acquisition and streamlining the construction process. This option provides more control and flexibility to the proponent over the project's development and operation. The site is well-located in regard to the following:

- **Established Industrial Zone:** Located within a planned industrial estate (SIE), minimizing environmental and land-use conflicts with residential or sensitive receptors.
- **Logistical Connectivity:** Excellent connectivity to major transportation routes, including the Raiwind Road and the Motorway (M-2), ensuring efficient distribution of industrial products.
- **Industrial Infrastructure:** Immediate availability of essential infrastructure such as industrial-grade electricity, a centralized sewerage network, and high-capacity access roads.
- **Economic Proximity:** Close proximity to Lahore's major markets, raw material suppliers, and a skilled technical workforce, significantly reducing logistics and operational costs.

The said site has the advantage of being not only environmentally friendly but also technically sound to enhance sustainable industrial development in the region. Therefore, the given site is the most suitable for the establishment of the M/S Nice Chain Co. Private Limited. project.

4.3 Technology Alternative

4.3.1 Design / Technology Alternatives, Their Selection and Rejection Criteria

In the industrial manufacturing industry, the selection of appropriate technology and design standards is critical for ensuring product durability, process efficiency, and regulatory compliance. For the proposed manufacturing facility by M/s Nice Chain Co. Private Limited., the selection of thermal processing technology is vital to ensure metallurgical precision and energy efficiency. While several furnace technologies exist, the following table summarizes the primary alternatives evaluated for the facility's heat treatment and melting operations:

Furnace Type	Best Use Case	Key Advantage	Status	Rationale
Induction Furnace	Clean scrap, small-to-medium batches, and high-purity ingots.	Electromagnetic stirring ensures chemical homogeneity.	Selected	Chosen for its ability to ensure the metallurgical precision required for high-strength chain alloys and its minimal

Furnace Type	Best Use Case	Key Advantage	Status	Rationale
				environmental impact.
Reverberatory Furnace	Large-scale operations, diverse scrap types, high volume.	High capacity and lowest operating cost per ton.	Rejected	Rejected due to lower energy efficiency in high-purity applications and higher potential for air emissions.
Rotary Furnace	Low-grade scrap, dross recovery, highly contaminated materials.	Rotating action improves heat transfer for contaminated loads.	Rejected	Rejected due to high emission profiles, which conflict with environmental standards in the Sundar Industrial Estate.
Tower (Shaft) Furnace	Clean, bulky scrap requiring high energy efficiency.	Uses exhaust gases to preheat scrap, reaching up to 77% efficiency.	Rejected	Deemed inappropriate due to the facility's requirement for flexible, batch-processing of diverse chain component types.

4.4 Environmental Alternatives, Their Selection and Rejection Criteria

The major aim of the manufacturing process at M/s Nice Chain Co. Private Limited. is to maximize resource efficiency and minimize environmental impact through sustainable production practices. Because industrial waste, if not properly managed, places significant stress on natural resources and creates disposal challenges, the company prioritizes recycling and efficient production cycles. These practices align with the pillars of sustainability by reducing waste and preserving resources for future generations. Below is a detailed explanation of the benefits associated with the operational approach of M/ Nice Chain Co. Private Limited.

i. Waste Reduction

- Through the systematic processing of raw materials and scrap, the amount of waste released into the environment is significantly reduced, thereby improving overall environmental health.
- This approach reduces health risks associated with industrial pollution and lowers the rate of solid waste production.
- Effective metal and material management also decreases the capital expenditure required for environmental rehabilitation projects intended to mitigate pollution.

ii. Automotive and Industrial Parts Production

- M/s Nice Chain Co. Private Limited. contributes to high-demand markets, including the automotive and agricultural sectors, by producing high-strength chain components.
- Lightweight materials and precision-engineered parts are essential in modern manufacturing to reduce the carbon footprint of transport vehicles by improving fuel economy.
- The industry maintains high rates of material recovery; for example, nearly 90% of automotive aluminum scrap is collected for recycling, reflecting a circular economy model that the company supports.

In summary, these benefits make the manufacturing operations at M/s Nice Chain Co. Private Limited. a sustainable short- and long-term solution to resource management challenges. By optimizing production and emphasizing material efficiency, the project helps mitigate mineral scarcity and simplifies industrial waste management, contributing to the broader industrial development of the region.

4.5 Economic Alternatives, Their Selection and Rejection

Managing metal waste is obviously linked to the management of the entire mineral cycle. Inadequate non degradable waste management pollutes environment that are important sources for all the inhabitants. Therefore, the discharge of metals waste, without or with inadequate treatment or reused in some other manner, involves significant costs, including environmental and social ones.

Metal waste management and processing involves significant benefits (avoided costs). Therefore, the cost of no action may be interpreted as benefits not achieved due to the release of metal waste with no or inadequate processing. In other words, if metal scrap is released into the environment without any processing, costs are generated or potential benefits are lost. The potential benefits associated with reuse or recycle the metal waste into costly material can be grouped into two general categories: market and non-market benefits. Most environmental and health benefits have significant value, but unlike most benefits from productivity cannot be valued in monetary units as market prices do not exist. Market benefits are easily identifiable and quantifiable, while non-market benefits are difficult to measure and require specific economic valuation methods. Where these benefits cannot be valued in monetary units because the techniques are in infancy, they will be reported into the analysis; no effort will be made to conflate non-monetary units onto monetary values.

Recycling aluminum has been shown to provide major economic benefits. As a result, it is appropriate for the aluminum industry to identify, develop, and implement all technologies that will optimize the benefits of recycling. Aluminum remains the most economically attractive material from which to make aircraft and space vehicles, and new construction proceeds at a prodigious rate.

4.6 Design as per ASME Standards

ASME standards provide a globally recognized framework for the design, fabrication, inspection, and testing of pressure vessels and storage systems. This standard is commonly used for utility equipment within the M/s Nice Chain Co. Private Limited. facility, such as high-pressure heat treatment vessels and air utility tanks. ASME-compliant equipment ensures:

- High safety levels through rigorous inspection and quality control.

- Proper material selection for high-pressure or hazardous thermal applications.
- Long service life and reliability under continuous industrial operations.
- Global certification, easing international supply chain integration and regulatory approvals.

While ASME is focused primarily on mechanical integrity and pressure handling, it serves as the foundational engineering standard for maintaining the structural safety of the facility's heavy-duty thermal processing equipment.

4.7 Design as per International Industrial Quality Standards

For the specific chain manufacturing requirements of M/s Nice Chain Co. Private Limited. International quality-focused design systems are employed. These standards are essential for the production lines due to their focus on:

- **Operational Precision:** Ensuring that every link and chain assembly meets exact dimensional tolerances.
- **Process Consistency:** Implementing standardized manufacturing steps to ensure uniform strength and wear **resistance** across high-volume production batches.
- **High-Performance Output:** Utilizing manufacturing techniques that enhance the tensile strength and fatigue life **of** the final chain products.

Conclusion

While ASME standards provide a strong foundation for pressure-containing components and are essential for certain utilities within the facility, specialized industrial and quality-focused design systems are more suitable for M/s Nice Chain Co. Private Limited. due to their focus on operational precision, process consistency, and high-performance output. Therefore, for M/s Nice Chain Co. Private Limited, a hybrid approach is adopted:

- **ASME standards** will be applied for mechanical and pressure systems, such as industrial pressure vessels and compressed air **systems**, to ensure structural and operational safety.
- **International industrial quality standards** will be implemented for all chain manufacturing processes, heat treatment lines, and precision machinery to ensure product durability and strict adherence to technical specifications.

This combined strategy ensures both operational safety and regulatory compliance, making it the preferred technological pathway for the proposed facility.

5 DESCRIPTION OF THE PROJECT

This chapter provides a simplified description of the M/S Nice Chain Co. Private Limited. project, which involves the installation of a high-efficiency chain manufacturing and casting unit, its salient features, its location, its components, and its various operational phases. Also covered in this chapter are the inputs such as water, fuel, electricity, and raw materials and the discharges, including wastes, emissions, and disposal methods associated with the construction and operation phases of the project. This proposal is a core component of the construction phase within the project cycle.

5.1 Type & Category of the Project

The proposed establishment of M/S Nice Chain Co. Private Limited. at Plot 759, 760 and 762, Sundar Industrial Estate, Lahore (GPS: 31°16'30.1"N 74°11'02.5"E), represents a modern, compliant facility dedicated to the annual production of 3 million motorcycle, industrial, agricultural, and conveyor chains using a systematic process of raw material cutting, stamping, heat treatment, shot blasting, assembly, lubrication, testing, and packing. Spanning 6.5 Kanals (0.8 acres/29,000 sq. ft.) with a total investment of PKR 250 million, the facility integrates specialized machinery including power presses, assembly machines, furnaces, shot blasters, riveters, and air compressors to handle raw materials like steel wire rods, alloys, and lubricants. Given the scale of its industrial metal processing and heat treatment operations, the project is classified under the Punjab Environmental Protection Act and relevant IEE/EIA regulations as a development requiring the preparation of a comprehensive Environmental Impact Assessment (EIA) report to ensure adherence to safety and operational standards.

5.2 Objectives of the Project

The proposed project involves the construction and commissioning of a manufacturing facility for M/S Nice Chain Co. Private Limited., situated on a dedicated 6.5 Kanal site at the Sundar Industrial Estate, Lahore. This industrial infrastructure is designed to provide a centralized and high-standard production hub for essential automotive and industrial chains, replacing current supply limitations with a permanent manufacturing solution capable of meeting regional industrial demands. The project site has been strategically selected within the planned industrial estate to ensure optimal logistical access while maintaining the strict environmental and safety buffers required for metal processing operations.

The project represents a substantial infrastructure investment of PKR 250 million aimed at enhancing the region's manufacturing capacity. The scope of work includes the procurement and installation of state-of-the-art chain assembly lines, heat treatment furnaces, and shot blasting equipment, alongside the construction of specialized testing and quality control zones. By utilizing modern manufacturing technology and advanced waste management systems, the project ensures a sustainable production process that will support the long-term economic growth and socio-economic development of the Punjab region.

5.3 Location and Site Layout of the Project

The project site is located at plot no. 759, 760 and 762, Sundar Industrial Estate, Lahore. The area has been officially declared an "Industrial Zone" by the competent authorities, ensuring it is appropriately designated for this type of development. The total area of the proposed project site is 6.5 Kanals (approximately 29,000 square feet or 0.8 acres). Furthermore, the facility is situated within an established industrial area, maintaining an appropriate operational buffer from residential populations.

Google Coordinates:

Google coordinates of the project site are as follows:

Latitude	31°16'30.1"N
Longitude	74°11'02.5"E

Surroundings of the Project Site

The Project Boundaries are provided below:

North	Rana Arshad Farm
South	Nice Chain Co. Pvt. Ltd
East	Open Land
West	Hope Field International Private Limited.



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Construction of Industrial & Automotive Chain Manufacturing Facility
M/s Nice Chain Co. Private Limited.
Environmental Impact Assessment (EIA)

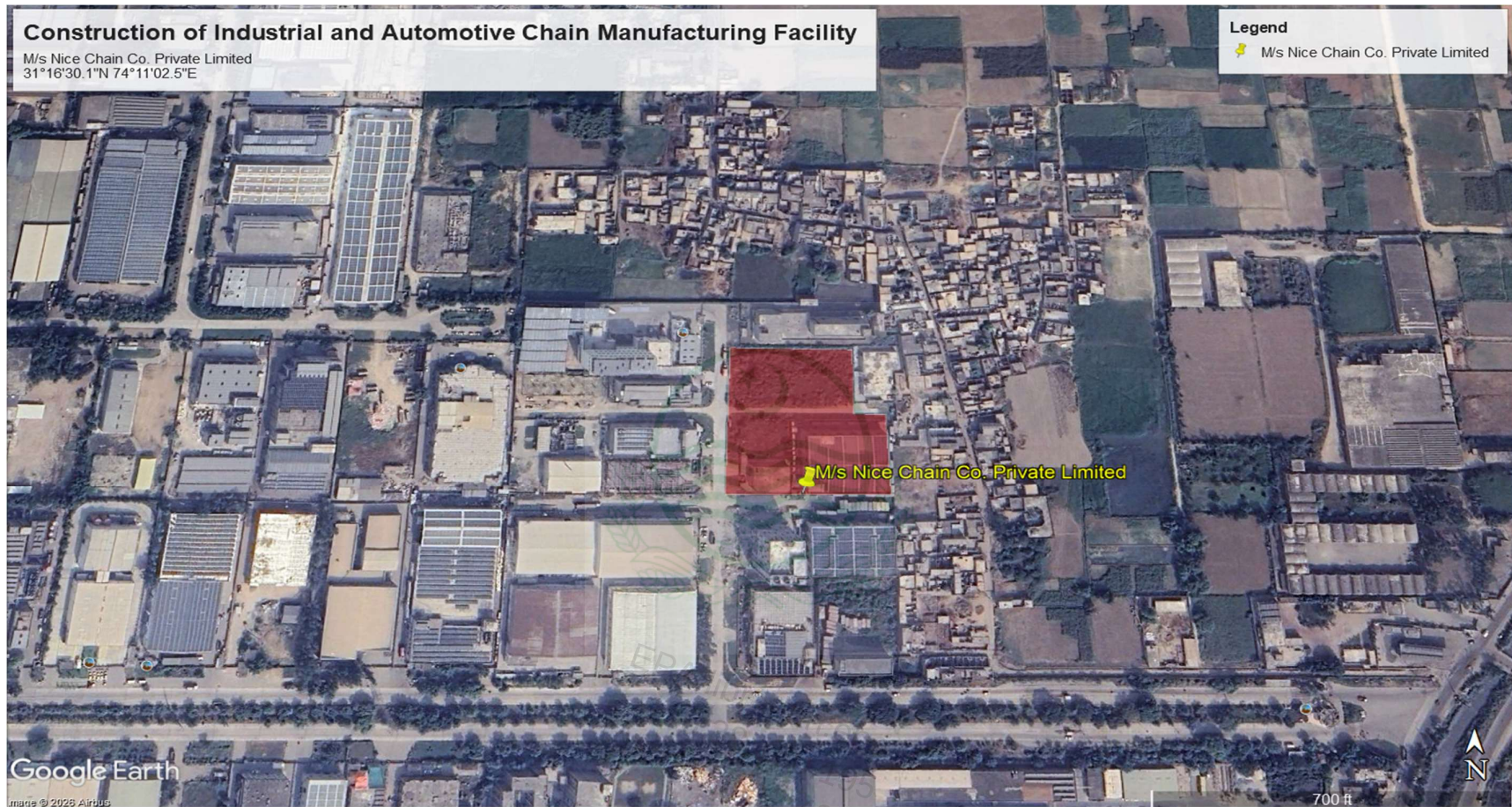


Figure 5-1: Location Map of the Proposed Project

5.4 Land Use on The Project site

The proposed site for M/S Nice Chain Co. Private Limited. is located at plot no. 759, 760 and 762 Sundar Industrial Estate (SIE), Lahore, within a dedicated industrial zone specifically developed to host large-scale manufacturing and processing units. The land is strictly categorized for industrial use, making it an ideal and compliant location for establishing a state-of-the-art chain manufacturing facility. The surrounding land use is characterized by a high density of diverse industrial operations, including various manufacturing and processing units, all operating within the structured framework of the industrial estate. This strategic placement ensures that the facility is surrounded by compatible industrial activities, with residential settlements located outside the estate boundaries at a safe distance. The site's inclusion in a planned industrial hub ensures access to purpose-built infrastructure while minimizing potential land-use conflicts with non-industrial stakeholders. Currently, the proposed land is open land and already owned by the proponent, with a total area of 6.5 Kanals (approximately 29,000 square feet or 0.8 acres).

5.5 Road Access

The proposed site of M/S Nice Chain Co. Private Limited, located in Sundar Industrial Estate (SIE), Lahore, enjoys excellent road connectivity designed specifically for heavy industrial logistics. It is directly accessible via the internal high-capacity road network of the Sundar Industrial Estate, which connects seamlessly to Raiwind Road—a major arterial route linking the facility to the city's central commercial hubs and national distribution networks.

Additionally, the site's close proximity to the Motorway M-2 (Lahore-Islamabad) and the Lahore Ring Road facilitates the highly efficient transportation of raw materials and finished industrial and automotive chain products to and from the facility. The estate's internal roads are wide, asphalt-paved, and structurally engineered to handle heavy traffic loads, including multi-axle commercial vehicles and containerized cargo transport.

This reliable road access minimizes logistical bottlenecks, ensures smooth daily engineering operations, and supports rapid emergency response and routine regulatory inspections by the **Punjab EPA**. Ultimately, this robust connectivity enhances the project's feasibility from both an operational and supply chain perspective, ensuring a seamless, stable link between the manufacturing block and the broader industrial, automotive, and engineering markets.

The road access map is shown in the Figure 5-2 below.

Construction of Industrial & Automotive Chain Manufacturing Facility
M/s Nice Chain Co. Private Limited.
Environmental Impact Assessment (EIA)



Figure 5-2: Road Access near the Project Site

5.6 Vegetation Features of the Site

The proposed project site for M/S Nice Chain Co. Private Limited. is located within the Sundar Industrial Estate (SIE), Lahore, a strictly designated and developed industrial zone. The total project footprint comprises 6.5 Kanals. Because the site is situated within a fully planned industrial estate, it contains virtually no natural or undisturbed vegetation. The land has been primarily cleared, graded, and leveled for industrial construction, characterized by barren ground with only minor patches of seasonal wild grasses or common hardy shrubs.

No agricultural activities are carried out on or adjacent to the site, and there are no ecologically sensitive plant species, endangered flora, natural habitats, or forested areas present within the plot boundaries. The nearest notable vegetation consists of planned green belts and roadside tree plantations systematically maintained by the SIE management along the main boulevards. Consequently, the construction and operation of the chain manufacturing facility will not cause any significant adverse impacts on local natural vegetation or biodiversity. To further ensure environmental compliance and aesthetic integration, the project proponent will develop a dedicated green belt and implement proper landscaping measures within the facility plot boundaries during the operational phase.

5.7 Cost and magnitude of the operations

The total capital investment for the M/S Nice Chain Co. Private Limited. manufacturing facility is estimated at PKR 250 Million. The proposed timeline for the completion of the project, including civil works, the installation of heavy specialized machinery, and the commissioning of industrial power and utility systems, is approximately 6 months.

This investment ensures the establishment of a state-of-the-art facility capable of meeting the high-volume industrial and automotive demand for precision Motorcycle Chains, Industrial Roller Chains, Agricultural Chains, and Conveyor Chains. The budgetary allocation is meticulously distributed to cover the heavy structural engineering required for the production floor (designed to withstand automatic mechanical stamping and link-punching forces), the procurement of advanced raw material shearing lines, high-temperature heat-treatment ovens for chain hardening, automated assembly loops, and integrated localized air-filtration and pollution-mitigation systems

5.8 Schedule of Implementation

The outlined project implementation schedule for the proposed project is intended to be followed, contingent upon smooth execution as per the plan and the absence of significant obstacles. The implementation stages for the facility at Plot # 759, 760 and 762, Sundar Industrial Estate include:

1st Stage: Planning and Regulatory Approvals

- Conducting topographic surveys, soil testing, and geotechnical investigations of the plot.
- Finalizing the architectural design and industrial layout plan for the chain manufacturing facility.
- Obtaining approval of building plans from Sundar Industrial Estate (SIE) management and necessary regulatory clearances from the Punjab EPA.

2nd Stage: Civil Works and Infrastructure

- Ground excavation and foundation laying.
- Civil construction of specialized production blocks and storage areas.
- Installation of utility networks, including industrial electricity, water supply, and gas connections.
- Construction of the Water Treatment plant, necessary industrial wastewater treatment systems, and primary drainage systems.

3rd Stage: Equipment Installation and Finishing

- Installation of specialized production machinery, including power presses, chain assembly lines, heat treatment furnaces, and shot blasting equipment.
- Installation of industrial ventilation systems and controlled environments required for metal processing.
- Establishment of the Quality Control (QC) and testing laboratories.
- Internal finishing, electrical wiring, and mechanical works.

4th Stage: Commissioning and Validation

- Commissioning of production machinery and utility systems.
- Trial production runs for chain units under the supervision of technical experts.
- Comprehensive training of operational staff on quality standards and safety protocols.
- Validation and qualification of industrial production processes.

5th Stage: Commercial Operation

- Commencement of full-scale commercial chain production.
- Implementation of routine environmental monitoring and ongoing compliance with Punjab EPA requirements.

5.9 General Description of the Proposed Grid Station

The proposed project involves the establishment of a state-of-the-art manufacturing facility by M/S Nice Chain Co. Private Limited. at the Sundar Industrial Estate, Lahore, covering a total area of approximately 6.5 Kanals (29,000 sq. ft.). This project is aimed at establishing a modern, fully compliant manufacturing facility specialized in the production of high-quality industrial and automotive chains, including motorcycle, industrial roller, agricultural, and conveyor chains. The facility consists of multiple specialized production and utility units, including advanced power press machines, chain assembly lines, heat treatment furnaces, and shot blasting equipment, designed to achieve a production capacity of 10,000 units per day.

To support uninterrupted operations, the facility includes dedicated storage and warehousing infrastructure for raw materials, finished products, and packaging. In addition, comprehensive quality control and industrial compliance are ensured through dedicated testing laboratories and specialized inspection zones. The facility is constructed using advanced engineering designs to ensure durability, efficiency, and strict adherence to industrial safety standards. The infrastructure includes optimized resource management systems and primary drainage networks to ensure sustainable operations. With an investment of PKR 250 million and a significant industrial scale, the project qualifies as a major development within the Sundar Industrial Estate. Once completed, the project will contribute significantly to the local manufacturing industry

by providing high-quality chain products while generating technical employment and supporting the economic development of the Punjab region.

Table 5-1: Project Specifications (M/S Nice Chain Co. Private Limited.)

Feature	Specification
Project Type	Industrial Chain Manufacturing Facility
Proponent	M/S Nice Chain Co. Private Limited.
Location	Sundar Industrial Estate (SIE), Lahore
Total Land Area	6.5 Kanals (Approx. 29,000 sq. ft. / 0.8 Acres)
Primary Products	Motorcycle, Industrial Roller, Agricultural, & Conveyor Chains
Production Capacity	10,000 units/day (3 million units/annually)
Environmental Control	Industrial Waste Management & Drainage System
Regulatory Standards	Industrial Safety & Environmental Compliance Standards
Design Standards	Industrial Engineering & Manufacturing Frameworks
Infrastructure	Concrete & Industrial Building Structures
Power & Utilities	Industrial-grade SIE Grid Connection & Backup Systems
Compliance Bodies	Punjab EPA
Laboratory Units	Quality Control (QC) & Testing Laboratory
Strategic Access	Raiwind Road & Motorway M-2 Connectivity
Primary Beneficiary	Regional Industrial Sector & Punjab Manufacturing Market

5.10 Project components

The project comprises multiple integrated components essential for establishing a state-of-the-art manufacturing facility for M/S Nice Chain Co. Private Limited. Core components include specialized production sections dedicated to the manufacturing of high-quality automotive and industrial chains, utilizing advanced machinery such as power presses, assembly lines, heat treatment furnaces, and shot blasting units. To maintain product quality and industrial standards, the facility will feature support infrastructure including a dedicated testing area and a Quality Control (QC) laboratory designed to meet rigorous performance specifications.

5.10.1 Raw materials

Raw material requirements for the proposed project are as follows:

1. **Steel Wire Rod:** High-grade steel wire rods will serve as the primary raw material for chain link production, selected for its tensile strength and structural integrity.
2. **Steel Strip:** Precision-cut steel strips will be utilized in the stamping and punching stages to form specialized chain components.
3. **Alloy Steel:** Specific alloys will be sourced to enhance the wear resistance and fatigue strength of the final products, particularly for heavy-duty industrial applications.
4. **Lubricating Oil:** Industrial-grade lubricants will be applied to minimize friction and prevent premature wear during the assembly and operation of the chains.
5. **Grease:** High-viscosity grease will be utilized to provide long-term protection and smooth mechanical operation for high-load moving parts.
6. **Quenching Oil:** Specialized quenching oils will be used during the heat treatment process to achieve the required hardness and material properties for the chains.

Raw materials will be obtained locally. Through the use of mechanized equipment, raw materials will be loaded into the preparation units, from where they will be transferred into the heat treatment furnaces for processing.



Figure 5-3: Raw Materials for Automotive and industrial chain manufacturing

5.11 Steps for Manufacturing of Automotive and industrial chain

The production cycle at M/S Nice Chain Co. Private Limited. is engineered for precision and durability, following these systematic technical stages:

- **Raw Material Preparation**

The process begins with the rigorous inspection and staging of high-grade steel wire rods, strips, and alloy materials. These materials are verified against material specifications to ensure the structural integrity of the final product.

- **Precision Cutting**

Raw materials are precision-cut into required lengths using high-capacity industrial shearing equipment to ensure consistency across all production batches.

- **Stamping and Punching**

The cut steel segments are subjected to high-force stamping and punching processes. This stage accurately shapes the individual chain components, ensuring they meet the required dimensions for seamless assembly.

- **Heat Treatment**

Components undergo a controlled heat treatment process within specialized furnaces. This critical stage has ensured the material achieves the optimal balance of hardness, ductility, and fatigue strength required for heavy-duty industrial application.

- **Shot Blasting**

To achieve a superior surface finish and remove any scale or impurities resulting from the heat treatment, the components are processed through a high-velocity shot blasting system.

- **Mechanical Assembly**

The prepared components are integrated into the final chain assembly on automated lines. The proponent has ensured that this process adheres to precise tolerances to prevent premature wear during operation.

- **Precision Lubrication**

Once assembled, the chains pass through an automated lubrication bath. This step ensures deep penetration of high-viscosity lubricants, which protects internal surfaces against friction and corrosion.

- **Performance Testing**

Every batch undergoes comprehensive stress and durability testing. The proponent has ensured that the testing protocols confirm the chain's ability to withstand high mechanical loads and perform under operational stress.

- **Final Packing**

The finished, inspected products are securely packed in moisture-resistant materials to ensure quality is maintained during transit and storage prior to market distribution.

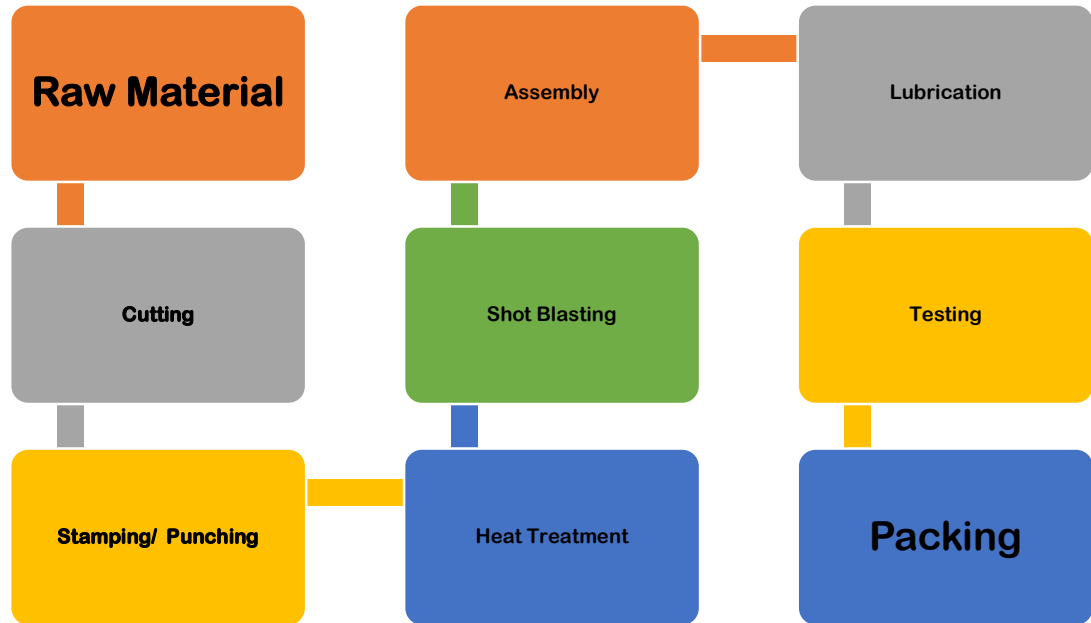


Figure 5-4: Process Flow diagram, M/S Nice Chain Co. (Pvt.) Ltd.

5.12 Equipment and Machinery

The following table details the primary machinery and equipment utilized in the manufacturing process for M/S Nice Chain Co. Private Limited. The proponent has ensured that each piece of equipment is selected to maintain high operational efficiency and adhere to technical manufacturing standards.

Machine Name	Functional Detail	
Power Press Machine	Used for high-force stamping and punching of steel strips into precise chain component shapes.	
Chain Machine Assembly	Automated system designed to integrate individual components into complete chain configurations with exact tolerances.	
Heat Treatment Furnace	Controlled environment furnace used to achieve the necessary hardness, ductility, and fatigue strength of components.	
Shot Blasting Machine	Employs high-velocity media to clean and refine the surface finish of components post-heat treatment.	

Machine Name	Functional Detail	
Riveting Machine	Specialized unit used to securely fasten pins and side plates, ensuring the structural integrity of the assembled chain.	
Testing Machine	Critical equipment used for performing stress, durability, and load-bearing tests to verify product performance.	
Air Compressor	Provides high-pressure air necessary to power pneumatic tools and automated systems throughout the facility.	

5.13 Manufacturing Process: M/S Nice Chain Co. Private Limited

The production process at the M/S Nice Chain Co. Private Limited. facility involves sophisticated mechanical and thermal systems designed for precision industrial manufacturing. The following sections detail the operational stages and the corresponding machinery utilized to ensure high-quality output

A. Raw Material Pre-treatment and Preparation

The proponent has ensured that all incoming materials undergo rigorous preparation to maintain the structural integrity of the final product.

- **Sorting and Cleaning:** Raw materials, including steel wire rods and alloy strips, are categorized and cleaned to remove surface contaminants or impurities.
- **Mechanical Processing:** Specialized machinery is used to shred or prepare the material, ensuring the input is optimized for the subsequent forming stages.

B. Precision Forming and Heat Treatment

Once prepared, the materials are processed through high-capacity industrial equipment.

- **Forming and Punching:** The materials are introduced into high-force industrial presses, where precise stamping and punching occur to shape the individual chain components.
- **Heat Treatment:** Components are transferred into high-temperature furnaces. The proponent has ensured that these furnaces utilize controlled heating cycles to achieve the necessary hardness, ductility, and fatigue strength required for heavy-duty industrial applications.

Table 5-2: Heat Treatment Process and Capacity Specifications

Technical Parameter	Specification / Capacity
Furnace Type	Continuous Atmosphere-Controlled Heat Treatment Furnace.

Technical Parameter	Specification / Capacity
Operational Capacity	500 kg to 800 kg per hour, depending on product dimensions.
Temperature Range	800°C to 1,050°C, with PID-controlled accuracy within $\pm 5^{\circ}\text{C}$.
Atmospheric Control	Integrated gas-carburizing system to ensure uniform surface hardening and optimal fatigue strength.
Quenching System	Automated oil-quenching bath with constant temperature circulation for consistent material hardness.
Cycle Time	Variable, optimized per batch to achieve specified Rockwell C (HRC) hardness ratings.

C. Surface Finishing and Mechanical Assembly

- **Shot Blasting:** To achieve a superior surface finish and remove any scale resulting from heat treatment, components are processed through high-velocity shot blasting equipment.
- **Automated Assembly:** The proponent has ensured that the assembly process utilizes specialized machinery to integrate individual components into complete chain configurations with exact tolerances.

Operation	Technical Specification
Shot Blasting	Equipped with a 15 kW turbine capacity for high-velocity surface impact. The proponent has ensured that the blast media is continuously filtered to maintain high surface finish standards.
Automated Assembly	Integrated with high-precision linkage detection systems. The proponent has ensured that the machinery maintains assembly tolerances within 0.05 mm to guarantee structural consistency.

D. Quality Assurance and Product Validation

The proponent has ensured that every stage of production is supported by a rigorous quality management system to guarantee that all chain products meet mechanical and durability specifications.

- **Performance Testing:** During the operational phase, the facility utilizes specialized tensile testing rigs and fatigue-load machines to perform stress, durability, and load-bearing evaluations. The proponent has ensured that these tests are performed on random samples from each batch to confirm compliance with design standards.
- **Dimensional Inspection:** Components are subjected to precise measurement protocols using calibrated gauges and optical inspection tools. This ensures that

every assembly maintains the exact tolerances required for smooth power transmission and operational longevity.

- **Final Certification and Storage:** Once products pass all mechanical stress and dimensional checks, they are systematically inspected for surface finish quality. The finished chains are then lubricated, securely packaged, and labeled for distribution, ensuring they remain protected from environmental factors during storage and transit

E. Finalization and Product Dispatch

Upon completion of the final assembly and surface treatment, the products are transitioned to the finishing area. The proponent has ensured that the final products are prepared for market distribution through the following systematic stages:

- **Final Quality Validation:** Samples from every production batch are subjected to rigorous mechanical stress and durability testing to verify that they meet the project-specific technical standards.
- **Dimensional Accuracy:** Each finished chain is inspected using calibrated measurement tools to ensure that pitch, width, and roller diameter tolerances remain within the established precision limits.
- **Packaging and Labeling:** The finished products—typically packaged in bulk reels or individual boxes depending on client requirements—are systematically labeled with technical specifications, batch numbers, and manufacturing dates for full traceability.
- **Preparation for Dispatch:** The proponent has ensured that the final products are securely strapped and palletized to prevent damage during storage and transit to regional industrial and automotive markets.

Table 5-3: Products to be manufactured at the M/S Nice Chain Co. Private Limited. facility

Sr. No.	Product Name	Product Category	Primary Use/Indication
1	Motorcycle Chains	Automotive	Power transmission in two-wheelers.
2	Industrial Roller Chains	Industrial	Mechanical power transmission in machinery.
3	Agricultural Chains	Agricultural	Application in farming equipment and harvesters.
4	Conveyor Chains	Industrial	Material handling and production line transport.

5.14 Project Capacity

The following table details the comprehensive manufacturing capabilities of M/S Nice Chain Co. Private Limited. for its industrial chain product range, including motorcycle, industrial roller, agricultural, and conveyor chains. The facility is equipped to handle high-volume production, with a total daily capacity reaching up to 10,000 units. The proponent has ensured that this production scale maintains a consistent supply of high-grade industrial chains to meet regional manufacturing and agricultural demands.

Table 5-4: Daily and Annual Manufacturing Capacities of M/S Nice Chain Co. (Pvt.) Ltd.

Product Range	Daily Capacity	Annual Capacity (Estimated)
Motorcycle Chains	4,000 units	1.2 Million units
Industrial Roller Chains	3,000 units	0.9 Million units
Agricultural Chains	2,000 units	0.6 Million units
Conveyor Chains	1,000 units	0.3 Million units
Total Facility Output	10,000 units	3.0 Million units

5.15 Electricity

LESCO (Lahore Electric Supply Company) will be the primary source of electricity for the M/S Nice Chain Co. Private Limited. facility at Sundar Industrial Estate. The electrical infrastructure is designed to support high-precision industrial machinery, including the Power Press, Heat Treatment Furnaces, and Automated Assembly lines. To ensure uninterrupted operations and maintain the consistency of the heat treatment and assembly processes, the proponent has ensured that a high-capacity standby generator will provide emergency power during load-shedding or grid failure. This ensures that critical systems, such as the induction furnaces (operating at 800°C–1,050°C) and automated assembly units, remain operational to prevent production delays and batch loss.

5.16 Water Supply

The primary water source for the M/s Nice Chain Co. Private Limited. facility will be the dedicated industrial supply provided by the Sundar Industrial Estate (SIE). This water will undergo processing in an on-site treatment system to ensure it meets the operational requirements for industrial cooling and maintenance. The proponent has ensured that these water outputs are managed effectively to support the shot blasting, lubrication baths, and heat treatment cooling systems.

5.16.1 Operational Water Usage

- The water supply is primarily utilized for the cooling of heat treatment furnaces, where the proponent has ensured consistent circulation to prevent thermal damage.
- The proponent has ensured that water used in the lubrication and cleaning stages is treated to prevent corrosion and maintain the surface finish quality of the manufactured chains.
- The proponent has ensured that the industrial water management system adheres to the sustainability guidelines set forth by the Sundar Industrial Estate

5.17 Natural Gas / Fuel

The facility at Sundar Industrial Estate utilizes LESCO-supplied electricity and SNGPL-provided natural gas to power high-precision manufacturing systems. A high-capacity standby generator fueled by High-Speed Diesel (HSD) ensures operational continuity for heat treatment and assembly lines during power fluctuations. The site management has ensured that all industrial utilities are configured to maintain the structural integrity

and quality of M/S Nice Chain Co. Private Limited. product range. This infrastructure supports a daily output of 10,000 units, ensuring a reliable supply for industrial and automotive sectors.

5.18 Water Requirement and Management

5.18.1 Construction Phase

During the construction phase, water will be primarily required for civil works, concrete mixing, curing, and dust suppression (sprinkling), as well as meeting the domestic needs of the construction workforce.

- **Quantity Required:** The estimated water consumption during this phase is 400 gallons per day.
- **Source & Extraction:** This requirement will be met entirely via groundwater, extracted safely using a motorized pump installed at the site.

5.18.2 Operational Phase

Once the manufacturing plant is fully operational, water consumption will split between industrial processes and the domestic needs of the staff.

- **Quantity Required:** The total water requirement during optimum plant operation is estimated to be approximately 1800 liters per day.
- **Primary Consumptive Uses:** Water will be utilized across three main areas:
 - **Domestic Use:** Drinking, sanitation, and hygiene facilities for the 150–160 operational workers.
 - **Industrial Processes:** Process cooling and steaming necessary for manufacturing motorcycle parts.
 - **Site Maintenance:** Periodic sprinkling for dust control and green belt maintenance.
- **Source of Supply:** To ensure a reliable and continuous supply, groundwater remains the primary source, extracted on-site via an efficient motor pump system.

5.19 Wastewater Generation & Disposal

- **Generation:** The facility is expected to generate approximately 700 liters per day of wastewater. This effluent originates entirely from domestic sources (washrooms and canteen facilities); no toxic chemical process wastewater is anticipated.
- **Treatment & Ultimate Disposal:** The generated domestic wastewater will first be routed to an on-site Septic Tank for primary treatment and sedimentation. The overflow effluent will then be safely discharged into the Sunder Drain in compliance with local environmental discharge regulations.

5.20 Design of Septic Tank

Septic tanks will be installed within the boundary wall of the project site. Design is given in Figure 5-5. below

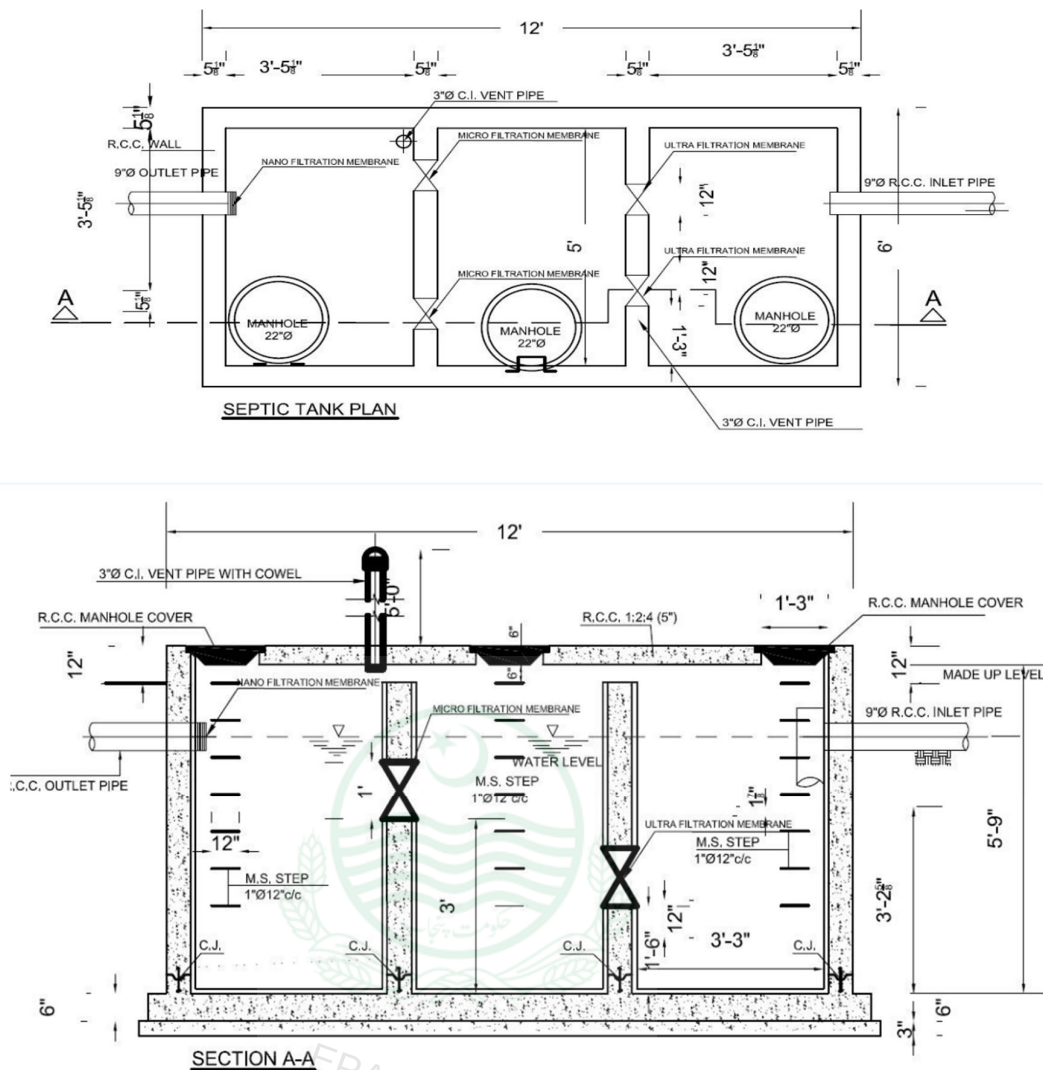


Figure 5-5: Design of the septic tank (M/s Nice Chain Co. Private Limited.)

5.21 Air Emissions and Control Measures

The manufacturing facility of M/S Nice Chain Co. Private Limited. is engineered to minimize its environmental footprint regarding local ambient air quality. Because the operations focus strictly on the production of specialized chain systems specifically Motorcycle Chains, Industrial Roller Chains, Agricultural Chains, and Conveyor Chains, the process emissions are highly localized and inherently lower compared to chemical synthesis or heavy primary metallurgy industries.

5.21.1 Sources of Emissions

- **Process Emissions:** Minor oil mist, localized smoke, and thermal vapors generated during high-speed link punching, component precision machining, and the oil-quenching or tempering steps involved in the heat-treatment loop of the high-strength chain plates and pins.
- **Particulate Matter (Metallic Dust):** Fine steel dust and suspended particulates (PM₁₀ and PM₂₅₀) generated during the uncoiling and shearing of raw steel strips,

mechanical component tumbling, shot-peening (used to increase the fatigue life of the chains), and final assembly lines.

- **Utility Emissions:** Intermittent combustion emissions (such as NO_x, CO, and smoke) originating from any standby backup generator setups, utilized exclusively to maintain operations during localized power outages.
- **Control and Mitigation Measures**

To maintain absolute compliance with the Punjab Environmental Quality Standards (PEQS), the facility integrates the following targeted air pollution control strategies into its engineering framework:

- **Oil Mist Collectors & Localized Exhausts:** Heavy stamping presses and automatic pin/roller machining lines will be fitted with specialized oil mist collectors to capture airborne cutting-fluid or cooling-lubricant vapors directly at the source.
- **Cyclone Separators & Baghouse Filters:** Dedicated cyclone units and heavy-duty fabric bag filters will be integrated into the shot-peening, tumbling, and component-cleaning bays to trap fine metallic particulates before process air is vented out.
- **Thermal Venting Stacks:** Quenching and tempering furnaces used for structural hardening of the chains will vent thermal exhausts via high-temperature stacks, designed according to regulated height protocols to ensure safe dispersion.
- **Utility Stack Monitoring:** Routine emission testing of backup power stacks will be scheduled to guarantee that criteria combustion pollutants remain safely within the limits defined by the PEQS.

Through these specific physical extraction and dry-filtration measures, M/s Nice Chain Co. Private Limited. will safely maintain a clean indoor working environment for its 150–160 personnel while fully preserving the ambient air quality of the Sundar Industrial Estate.

5.22 Noise Control

All heavy machinery involved in chain manufacturing including high-speed link pressing machines, automated stamping units, component tumblers, and raw material shearing equipment—will be installed and operated within a structurally enclosed, sound-insulated production hall. This setup ensures that operational noise remains contained and does not disturb the broader industrial surroundings or neighboring zones within the Sundar Industrial Estate.

Furthermore, the administration of M/s Nice Chain Co. Private Limited. will implement strict engineering and management controls to minimize potential noise emissions, including:

- **Preventive Maintenance:** Routine inspection, alignment, and lubrication of all heavy punching dies, rollers, and mechanical conveyor systems to minimize friction-based noise and mechanical vibrations.
- **Acoustic Containment:** Installation of acoustic enclosures for the 400 KVA Transformer area and any standby emergency generators, alongside high-efficiency silencers on all high-pressure pneumatic systems and furnace venting units.

- **Vibration Dampening:** Heavy-duty stamping presses and link-punching equipment will be mounted on specialized vibration-absorbing foundation pads to prevent structural noise from traveling through the floor.
- **Worker Safety (PPE):** Providing high-grade Personal Protective Equipment (PPE), such as earplugs or industrial earmuffs, to the 150–160 staff members operating in close proximity to the high-speed stamping, shot-peening, or mechanical tumbling bays.
- **Monitoring:** Conducting regular ambient and workplace noise level testing to ensure continuous, unwavering compliance with the Punjab Environmental Quality Standards (PEQS) for industrial zones and local occupational health protocols.

5.23 Solid Waste Management

The primary streams of non-hazardous solid waste generated at the facility will consist of domestic waste (food scraps, organics) from the 150–160 personnel, alongside minor amounts of packaging waste (cardboard, wooden pallets, shrink wrap).

Estimated Quantity: Approximately 60–70 kg/day of combined domestic and packaging waste will be generated.

5.24 Solid Waste Management System & Practices

To ensure a clean, hygienic, and environmentally compliant facility, solid waste will be managed through a systematic approach:

- **Source Segregation:** Placement of segregated, color-coded waste bins for different waste categories (organics, recyclables, general waste) across all production, administrative, and dining areas.
- **Routine Collection:** Internal sanitary workers will collect waste from all site receptacles on a daily basis.
- **Internal Transfer:** The collected waste will be safely transferred to a designated on-site central storage area.
- **Final Disposal:** Waste will be handed over to a registered local waste contractor or the Sundar Industrial Estate's municipal authority for proper dumping, recycling, or landfilling.

5.25 Solid Waste Storage Facility

A dedicated central solid waste storage area will be allocated within the 6.5 kanal premises of the project.

- **Design & Security:** To prevent wind-blown litter, pest intrusion, and scavenging, the storage area will be enclosed by boundary walls approximately **8 feet in height** on all four sides.
- **Contractual Agreement:** M/s NICE CHAIN CO. Private Limited. will maintain a formal contract with an EPA-approved waste management company or landfill contractor to ensure regular, documented collection and off-site disposal.

5.26 Solid Waste Facilities & Internal Transport

- **Equipment:** A network of standardized waste containers and wheeled bins will be strategically stationed throughout the working zones. Hand carts and heavy-duty wheeled bins will be utilized for internal transport.

- **Handling Protocol:** Dedicated sweepers and sanitary workers will be appointed to manage the bins. To prevent spillage and odor during internal transport, all carts and bins moving waste to the central storage area will be properly covered with plastic liners or secure lids.
- **Schedule:** Internal waste collection to the central storage area will occur strictly on a daily basis.

5.27 Awareness & Training Plan

The management recognizes that effective waste management relies on human compliance. Therefore, all sanitary workers and relevant floor staff will undergo targeted training in Solid Waste Management (SWM). This training will cover:

- The linkage between a deteriorating environment, unmanaged waste, and human health.
- Proper segregation, handling, and transportation procedures.
- Occupational health and safety hazards.
- Strict enforcement of personal hygiene and the correct usage of Personal Protective Equipment (PPE) during waste handling.

5.28 Sludge Management

Given that the facility relies on a Septic Tank for its domestic wastewater treatment, biological sludge will accumulate over time.

- **Desludging & Disposal:** The septic tank will be periodically cleaned and desludged by a licensed vacuum-truck contractor.
- **Treatment:** The extracted sludge will be disposed of in an environmentally friendly manner by the contractor, typically through approved municipal co-composting facilities or incineration, ensuring no raw sludge is illegally dumped into local water bodies or open land.

5.29 Area and Layout

The total area for the M/S Nice Chain Co. Private Limited. project is 6.5 Kanal, located within the Sundar Industrial Estate, Lahore. The site layout has been meticulously planned to optimize industrial workflow ensuring a smooth, logical progression from raw steel coil handling to link pressing, heat treatment, and final chain assembly while prioritizing environmental safety, worker protection, and efficient waste containment.

5.30 Government Approval

In compliance with local regulatory frameworks, the proposed project site for M/S Nice Chain Co. Private Limited. is located on a plot measuring 6.5 Kanal within the master-planned Sundar Industrial Estate, Lahore. Obtaining formal environmental approval in accordance with Section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012) is a mandatory legal requirement for the project prior to the commencement of construction and operational activities.

5.31 Restoration/Rehabilitation at the End of Project Life

During construction, M/S Nice Chain Co. Private Limited. will ensure zero damage to the infrastructure of the Sundar Industrial Estate, with all civil debris, waste, and minor spills immediately cleared and the land leveled under constant water sprinkling for dust

control. Long-term ecological rehabilitation is not required since the 6.5 Kanal site is proponent-owned and located within a designated industrial zone. At the end of the project's operational lifespan, the facility will be carefully dismantled using standard demolition safety codes to minimize pollution and protect nearby properties. High-value salvage materials like structural steel and mechanical chain-press components will be segregated for recycling or resale, while all remaining non-recyclable debris will be disposed of in an environmentally sustainable manner in strict compliance with Punjab EPA and local regulatory frameworks.



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6 DESCRIPTION OF THE ENVIRONMENT

This chapter provides a simplified description of the M/S Nice Chain Co. Private Limited. project, which involves the installation of a high-efficiency chain manufacturing and casting unit, its salient features, its location, its components, and its various operational phases. Also covered in this chapter are the inputs such as water, fuel, electricity, and raw materials—and the discharges, including wastes, emissions, and disposal methods associated with the construction and operation phases of the project. This proposal is a core component of the construction phase within the project cycle.

6.1 Corridor of Impact (COI)

The Corridor of Influence (COI) includes the actual project footprint as well as the surrounding area in which positive and adverse impacts may be foreseen due to the construction of M/s Nice Chain co. (Pvt.) Ltd. The area of influence encompasses the location likely to be affected by the project, including all its ancillary aspects such as access roads within the Sundar Industrial Estate, waste disposal zones, and construction material storage areas, as well as unplanned developments induced by the subproject.

For the purposes of the environmental assessment, the area of influence for the proposed facility at Plot # 759, 760 And 762 has been defined as a 300-meter radius from the boundary of the project site. Additionally, a focused area of 100 meters has been designated as the immediate area of influence for the proposed construction and installation works to monitor localized effects such as noise, dust, and vibration.

6.2 Physical Environment

6.2.1 History of the area

Lahore, the vibrant heart of Pakistan, is a city where history meets modernity. Renowned for its rich cultural heritage, architectural splendor, and dynamic spirit, Lahore stands as a symbol of resilience and progress. The geography of Lahore Division comprises the various features relating to the land and climate. Lying between 31°15'—31°45' N and 74°01'—74°39' E, Lahore is bounded on the north and west by the Sheikhpura District, on the east by Wagha, and on the south by Kasur District. The Ravi River flows on the northern side of Lahore. Lahore city covers a total land area of 1014 km² and is still growing.

Lahore Division enjoys air, rail and road connections with rest of the country. The capital of the Punjab, Lahore has Allama Iqbal International Airport to cater the needs of District Lahore and its adjacent cities, as regular national and international flights run from here. Lahore Station is a major railway junction serving links to major cities. On the south of Lahore National Highway N-5 links Multan, on northwest and north runs Motorway M-1 and National Highway N-5 towards Gujranwala. On the west, it is linked with textile hub Faisalabad with a 4-lane highway, built on BOO (Built - Operate - Own) basis. A historical Grand Trunk Road which was a major artery during subcontinent era, originally built by Sher Shah Suri, the Afghan ruler, leads toward Indian border passing through the city. Lahore boasts a rich and storied history that spans over a millennium, making it one of the oldest and most culturally significant cities in South Asia. Once the capital of several great empires—including the Ghaznavids, Mughals, and Sikhs—Lahore has long been a center of art, architecture, learning, and political power. The city flourished during the Mughal era, leaving behind iconic landmarks such as the Badshahi Mosque, Lahore Fort, and Shalimar Gardens. Under British colonial rule, Lahore evolved into a key administrative and educational center, home to institutions like Government College and the University of the Punjab.

Today, the city's layered history is reflected in its vibrant streets, where ancient traditions and modern life coexist in harmony.

Lahore, a thriving industrial hub of Pakistan, stands as a beacon of industrial excellence, driving economic growth through its diverse and dynamic manufacturing sectors. Among its much industrial strength, the city has seen significant advancement in the production of wires and cables, supplying high-quality electrical components to meet both domestic and international demands. With state-of-the-art manufacturing units, skilled labor, and a focus on innovation, Lahore's wire and cable industry plays a crucial role in supporting the nation's infrastructure, energy, and construction sectors.

6.2.2 Topography

The combination of stable plains and proximity to developing residential zones makes this a geologically and strategically significant location for regional power infrastructure.

Topographically, Lahore City District comprises of level, and nearly level, surfaces. These surfaces had been used for irrigated-agriculture in the past. Currently, most of them are being urbanized at a rapid pace. The district is divided into 2 parts topographically:

- The low-lying areas along River Ravi (called hithar)
- The upland areas in the east of River Ravi (called uttar)

The lowlands, known as hithar are generally inundated by the waters of River Ravi which flows in the west of the district. The hithar areas are a part of the old bed of River Beas and, thus, usually receive inundation waters of the River Ravi during the Monsoons. The general height of the area is approximately 150-200 m above sea level. Uttar areas (upland) are situated in the north and form two-thirds of the entire land of the district, comprised mostly of fertile loamy soils.

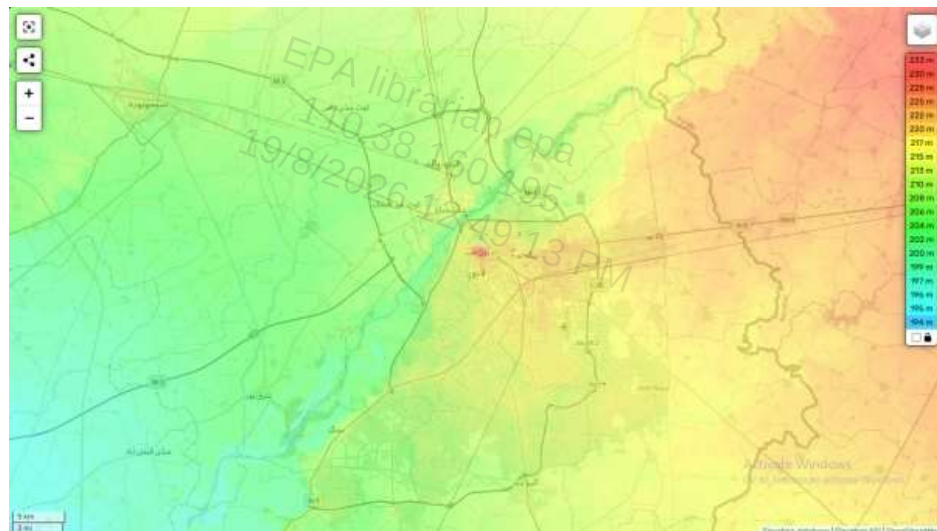


Figure 6-1: Map Showing the Digital Elevation of the Project area

6.2.3 Geology and Soil

The soil of the district is entirely alluvial and rich in potential plant nutrients. The soils of the hithar areas are soft alluvial and loam, but in some places, the soils are too sandy to be fertile. The soils of Lahore District are deposited by the Ravi River and its tributaries. These soils are generally fertile, well-drained, and suitable for a variety of agricultural activities. They range from sandy loam to clay loam in texture, supporting crops such as wheat, rice, sugarcane, and vegetables. However, in some areas, soil fertility is affected by salinity and waterlogging, requiring proper management practices. Overall, the district's soil profile supports both agriculture and urban development due to its favourable composition and structure.

6.2.4 Seismic Activity/Seismicity

Lahore lies in a region of moderate seismic activity and situated within Seismic Zone 2B as classified by the Pakistan Building Code (2007). This zone indicates a region with low to moderate risk, where seismic events are possible but generally not highly destructive. The city is not located directly on any major active fault line, but it can be affected by distant seismic sources from northern and western Pakistan, including the Main Boundary Thrust (MBT) and the salt Range Fault System. Earthquakes originating from these zones can produce tremors felt in Lahore, especially from significant seismic events such as those in the Hindukush or Kashmir regions. While Lahore is not highly prone to strong earthquakes, it remains vulnerable to secondary effects such as structural damage due to moderate tremors, especially in poorly constructed or unregulated buildings. Therefore, adherence to seismic-resistant construction codes and proper urban planning is essential for risk mitigation.

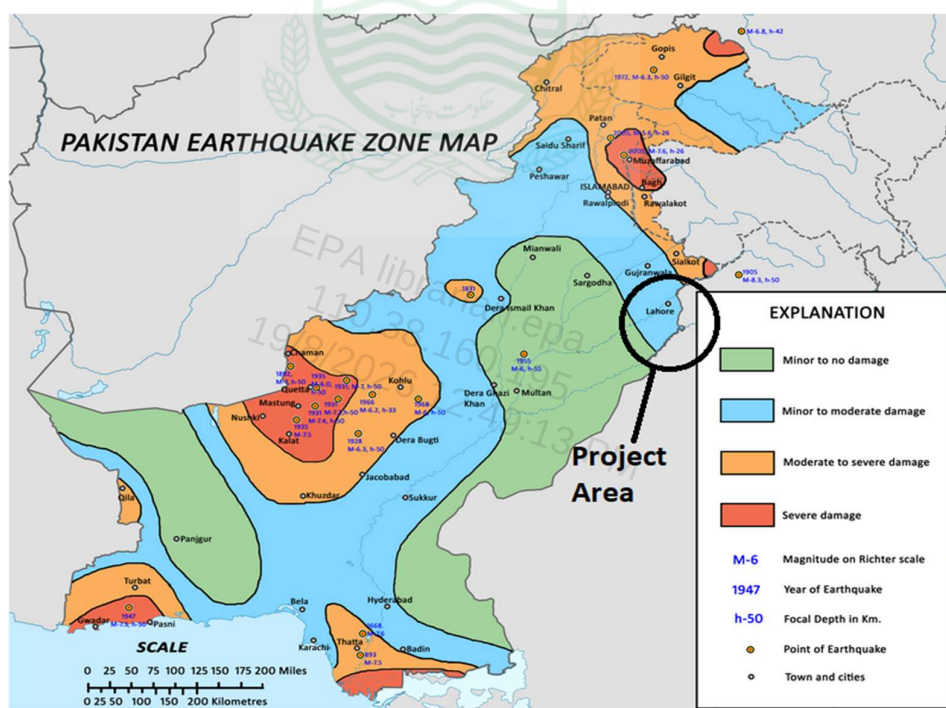


Figure 6-2: Map Showing the Earthquake Vulnerability of Project Area

6.2.5 Climate, Temperature, and Rainfall

Lahore experiences an extreme climate characterized by scorching summers and chilly winters. The summer season begins in April and lasts until September, with May,

June, and July being particularly oppressive. June is the hottest month, with average maximum temperatures reaching up to 40°C and minimums around 27°C. Occasional dust storms and intense heat waves are common features of this period. The monsoon typically arrives toward the end of June, bringing intermittent rain spells through mid-September.

Winter spans from November to February, with January being the coldest month. During this time, average maximum and minimum temperatures are about 20°C and 6°C, respectively, though temperatures can drop as low as 0°C.

Lahore's semi-arid climate includes five distinct seasons:

- **Foggy winter** (Nov 15 – Feb 15), with cold temperatures and occasional western disturbances.
- **Pleasant spring** (Feb 15 – Apr 15).
- **Hot and dusty summer** (Apr – Jun), marked by intense heat and storms.
- **Rainy monsoon** (Jul – Sep 15), with heavy rainfall and thunderstorms.
- **Dry autumn** (Sep 16 – Nov 14).

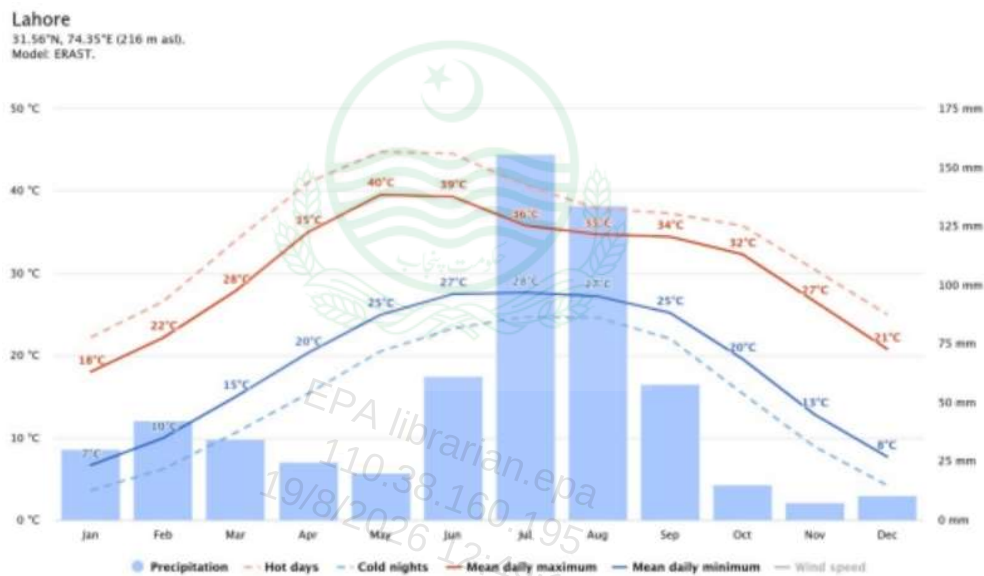


Figure 6-3: Climate and Average Weather Year-Round in Lahore

The average annual rainfall is approximately 630 mm, with July being the wettest month. Lahore has recorded extreme temperatures, including a high of 48.3°C on May 30, 1944, and a low of -1°C on January 13, 1967.

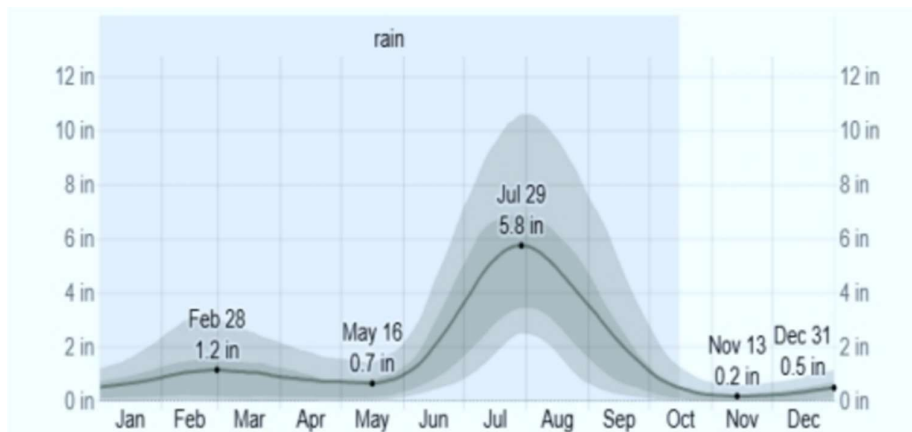


Figure 6-4: Average Monthly Rainfall in Lahore

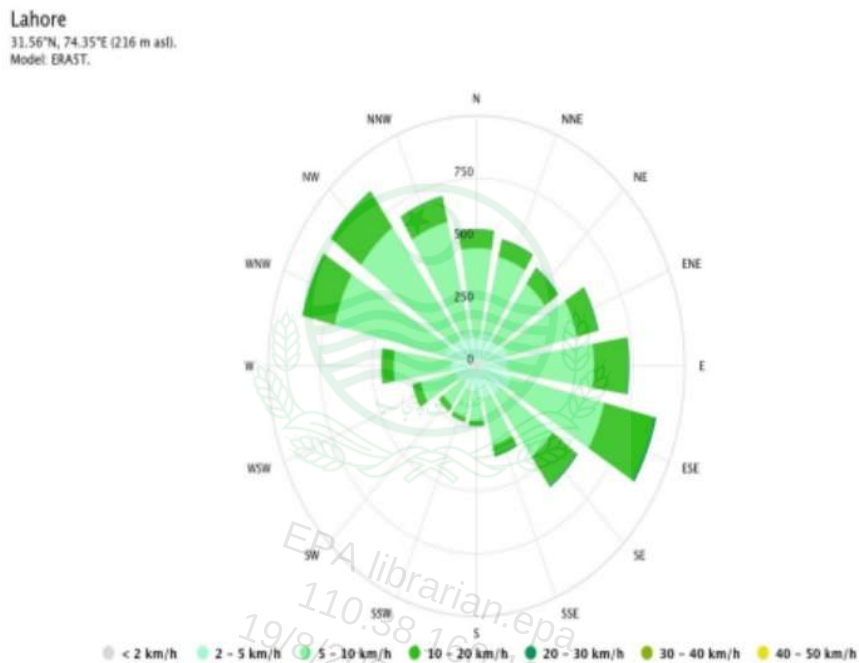


Figure 6-5: Wind Rose in Lahore

6.3 Water Resources

The water resources in Lahore are relatively more developed compared to arid regions, with availability from both surface water and groundwater sources. Water for industrial and domestic use in the region is primarily supplied through the extensive aquifer system and tube wells, although groundwater levels in the Lahore district are gradually declining due to over-extraction and rapid urbanization. The underground water is supplied by the Sunder Industrial Estate in the project area as Project is present in Sunder Industrial Estate.

6.3.1 Main Recharge Sources

- Rainfall, the Ravi River during the monsoon, and irrigation canals provide limited natural recharge

- However, average precipitation is insufficient to offset heavy groundwater extraction.
- The river-based recharge is largely negligible outside the monsoon period

Emerging Solutions

- Initiatives like WWF-led rainwater harvesting and aquifer recharge schemes aim to boost groundwater levels — targeting up to 331,000 m³/yr recharge
- Sustainable management requires wastewater treatment, controlled extraction, and artificial recharge through rooftop capture or recharge wells.

Aspect	Detail
Surface water dependency	Ravi River — seasonal & polluted
Groundwater extraction	~1161 MCM/year
Annual recharge	~1013 MCM/year
Water table decline	~1 m/year
Pollution risk	Sewage and industrial effluent infiltrate aquifers
Recharge methods	Monsoon rain, canal flow, artificial recharge projects

6.4 Biological Base Line

Lahore's ecological resources, though challenged by rapid urbanization, remain vital for the city's environmental health and biodiversity. Green spaces such as parks, botanical gardens, canal banks, and urban forests support a variety of native flora and fauna, contributing to air purification, temperature regulation, and habitat preservation. Key ecological assets include the Lahore Canal greenbelt, Jallo Park, and the Lahore Botanical Garden, which serve as urban biodiversity hotspots. These resources play a crucial role in enhancing the city's resilience to climate change and improving the quality of life for its residents.

6.4.1 Flora

The area surrounding Plot 759, 760 And 762 lies within the established industrial ecological setting of the Sundar Industrial Estate in Lahore, where natural habitats have been significantly altered due to intensive industrialization, infrastructure development, and specialized land use. The original native vegetation of the region has largely been replaced by industrial structures, paved road networks, and planned ornamental plantations within the estate's green belts, with only small patches of seasonal grasses and hardy roadside shrubs remaining.

Faunal diversity in the area is low and primarily consists of urban-adapted and industrial-tolerant species such as sparrows, pigeons, crows, and mynas. Small mammals like rats and squirrels, along with common reptiles such as lizards, are occasionally observed within the peripheral areas of the industrial plots. No ecologically sensitive habitats, wildlife sanctuaries or protected ecological zones are present within the immediate project influence area or the 6.5 kanal facility site. Overall,

the biological environment reflects a highly modified industrial ecosystem with limited biodiversity, typical of modern, regulated industrial zones in Punjab.

Table 6-1: Flora of the project site (M/s Nice Chain Co. Private Limited.

Common Name	Scientific Name	Category
Neem	<i>Azadirachta indica</i>	Tree
Peepal	<i>Ficus religiosa</i>	Tree
Banyan	<i>Ficus benghalensis</i>	Tree
Eucalyptus	<i>Eucalyptus camaldulensis</i>	Tree (introduced)
Shisham (Indian Rosewood)	<i>Dalbergia sissoo</i>	Tree
Amaltas (Golden Shower)	<i>Cassia fistula</i>	Tree
Gulmohar	<i>Delonix regia</i>	Ornamental tree
Bougainvillea	<i>Bougainvillea glabra</i>	Shrub/Climber
Marigold	<i>Tagetes erecta</i>	Flowering plant
Alstonia	<i>Alstonia scholaris</i>	Tree
Grass (Doob Grass)	<i>Cynodon dactylon</i>	Ground cover

LC – Least Concern, NT – Near Threatened, VU – Vulnerable, EN – Endangered, CR – Critically Endangered, EW – Extinct in the Wild, EX – Extinct, DD – Data Deficient, NE – Not Evaluated.



Figure 6-6: Floral species in the Project Area

6.4.2 Fauna

The faunal presence around the M/s Chain Co. (Pvt.) Ltd. project site is relatively limited and mainly consists of species adapted to the industrial and disturbed environments of the Sundar Industrial Estate in Lahore. Due to intensive industrialization, infrastructure development, and the reduction of natural habitats, the

area supports mostly common and human-tolerant wildlife. Typical fauna includes small mammals such as rats and mice, which are commonly found in industrial zones and storage areas. Reptiles such as house lizards are also present, particularly in shaded corners of the industrial structures. Avifauna is dominated by urban-adapted birds including sparrows, pigeons, crows, and mynas, which thrive in human-altered landscapes and roadside green belts. Insect populations such as ants, flies, and beetles are also commonly observed, especially in irrigated ornamental patches and landscaped areas of the estate. No endangered, protected, or ecologically sensitive fauna has been recorded within the immediate project influence area or the 6.5 Kanal plot. Overall, the faunal composition reflects a typical industrial ecological setting with low biodiversity and species mainly adapted to modified habitats.

Table 6-2: Fauna around the project site

Common Name	Scientific name
Mammals	
Indian Palm Squirrel	<i>Funambulus palmarum</i>
Indian Grey Mongoose	<i>Herpestes edwardsii</i>
Fruit Bat	<i>Pteropus giganteus</i>
House Mouse	<i>Mus musculus</i>
Common Rat	<i>Rattus rattus</i>
Birds	
Common Name	Scientific Name
House Sparrow	<i>Passer domesticus</i>
Common Myna	<i>Acridotheres tristis</i>
Rock Pigeon	<i>Columba livia</i>
Red-wattled Lapwing	<i>Vanellus indicus</i>
Indian Peafowl (in parks)	<i>Pavo cristatus</i>
Cattle Egret	<i>Bubulcus ibis</i>
Black Kite	<i>Milvus migrans</i>
Reptiles and Amphibians	
Common Name	Scientific Name
Garden Lizard	<i>Calotes versicolor</i>
House Gecko	<i>Hemidactylus frenatus</i>
Indian Cobra	<i>Naja naja</i>
Common Toad	<i>Duttaphrynus melanostictus</i>

LC – Least Concern, NT – Near Threatened, VU – Vulnerable, EN – Endangered, CR – Critically Endangered, EW – Extinct in the Wild, EX – Extinct, DD – Data Deficient, NE – Not Evaluated.



Figure 6-7: Dominant Fauna in the project area

6.4.3 Protected Areas and Endangered Fauna

No wildlife protected area is available within or 500m radius of the right of way of the subproject. No forest area is available within or 500m radius of the right of way of the subproject.

Protected wildlife areas and endangered wildlife

Following are the wildlife protected areas of the district

- Game Reserve, a part of 5-Mile Border Strip
- Jallo Wildlife Park
- Tehra Plantation Wildlife Sanctuary

6.5 Socio Economic Environment

6.5.1 Socio-Economic Baseline

A detailed socio-economic assessment was conducted to collect information on Lahore, the second-largest city of Pakistan, is a dynamic socio-economic hub with a rapidly growing population exceeding 13 million. As the provincial capital of Punjab, it serves as a center for education, commerce, culture, and industry. The city boasts a high literacy rate of around 77%, supported by numerous universities, colleges, and technical institutions.

Economically, Lahore has a diversified base, with major contributions from the services sector, manufacturing industries (notably textiles, electronics, and cables), retail, and construction. Employment opportunities range from formal public and private sector jobs to informal labor markets. Despite its economic vibrancy, the city faces challenges such as income disparity, urban poverty, and housing shortages in peri-urban areas.

Healthcare facilities are relatively advanced, yet unevenly distributed. The city's robust infrastructure, cultural richness, and industrial activity make it a key driver of regional development, though rising population pressure continues to strain public services and environmental resources.

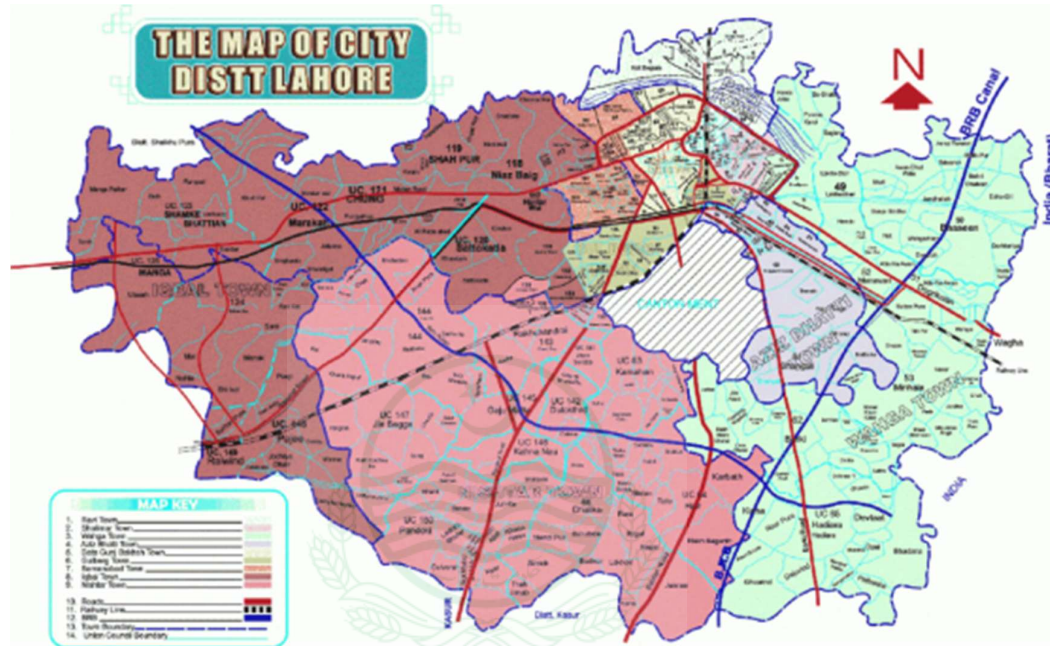


Figure 6-8: Map of Lahore city

6.5.2 Total Population and Area (2023) Population Profile of Lahore District – 2023 Census

Lahore, the capital of Punjab province, is the second-largest city in Pakistan after Karachi. According to the 2023 census, the population of Lahore exceeds 13 million, making it one of the fastest-growing urban centres in South Asia.

Table 6-3: Population profile of the project area

Total population	13,004,135	
Annual growth (2017–2023)	2.65%	
Gender split	Male	52.9%
	Female	47.1%
	Transgender	0.026
Population density	7,339 ppl/km ²	
Age Distribution	0–9 years	3.23 M
	10–19	2.67 M

	20–29	2.30 M
Literacy Rate (age 10+)	Overall 79.6%	
	Male	81.4%
	Female	77.6%

6.5.3 Education and Literacy in Lahore

Lahore is often hailed as Pakistan’s educational capital, home to a rich network of schools, colleges, and universities both public and private. It boasts some of the country’s most prestigious institutions, such as Government College University (est. 1864), University of the Punjab (est. 1882), University of Engineering & Technology (est. 1921), and Lahore University of Management Sciences (LUMS), the only AACSB-accredited business school in Pakistan.

Table 6-4: Literacy Rate of the project area

Category	Literacy Rate (%)
Overall	77%
Male	81%
Female	72%
Urban (District Avg)	83%
Rural (District Avg)	62%

Literacy & Enrollment

- The overall literacy rate in Lahore is approximately 79.6%, with male literacy at 81.4% and female literacy at 77.6%, ranking among the highest in the country
- Enrollment is strong, particularly at the primary and secondary levels, reflecting Punjab’s provincial averages—gross enrollment rates (GER) around 90% and net enrollment (NER) approximately 56%
- Youth literacy (15–24 years) in Punjab—where Lahore is located—surpasses 92% for both males and females in urban areas

6.5.4 Gender Higher Education & Institutions

- **Major universities in Lahore include Government College University (GCU):** Over 10,600 students; long history and top performance
- **University of the Punjab:** More than 45,000 on-campus students; one of South Asia’s oldest public universities
- **University of Lahore (UoL):** Private university with ~45,000 students and strong program offerings

There are also many reputable private schools (e.g., Lahore Grammar School, Beaconhouse) producing graduates who go on to top universities such as LUMS and abroad



Figure 6-9: Educational Institutions in Lahore

6.5.5 Language Distribution

The linguistic profile of the Sundar Industrial Estate and the surrounding Lahore district reflects a predominantly Punjabi-speaking population, consistent with the cultural and regional identity of central Punjab. Punjabi is the primary spoken language across the industrial workforce and local communities, while Urdu is widely understood and serves as the primary medium for official, educational, and administrative communication. Due to the industrial nature of the area, which attracts a diverse workforce from across the country, a small proportion of the population also communicates in other regional languages. The project area for M/s Nice Chain co. (Pvt.) Ltd. shows similar linguistic characteristics, with Urdu and Punjabi being the dominant languages used for daily operations and technical coordination

Table 6-5: Age Distribution

Language	Speakers (Estimated)	Percentage
Punjabi	10,250,000	82%
Urdu	1,500,000	12%
Pashto	375,000	3%
Saraiki	250,000	2%
Others	125,000	1%

6.5.6 Health Facilities and Services

The Lahore hosts one of the most extensive and diverse healthcare systems in Pakistan, catering to its rapidly growing population through a combination of public, private, military, and charitable facilities. The public health sector includes major teaching and tertiary care hospitals such as Mayo Hospital, Jinnah Hospital, Services Hospital, and Punjab Institute of Cardiology. These institutions handle high patient loads and offer specialized services in cardiology, surgery, neurology, pediatrics, and emergency care, though they often face challenges like overcrowding, limited equipment, and long wait times. The private healthcare sector has seen significant growth and includes modern hospitals like Shaukat Khanum Memorial Cancer Hospital, Evercare Hospital, Doctors Hospital, Hameed Latif Hospital, and National Hospital. These facilities offer high-quality medical services, including advanced diagnostics, surgical procedures, intensive care, and maternity services, often in better

environments but at a higher cost. Military hospitals such as CMH Lahore provide high-standard medical care and are accessible to both military personnel and civilians. Specialized institutions like Gulab Devi Hospital (for chest and respiratory diseases), Children's Hospital (for pediatric care), and the Punjab Institute of Mental Health (for psychiatric services) also serve critical health needs. Additionally, Lahore has a vast network of small private clinics, diagnostic laboratories, and outpatient services that improve access to healthcare across urban and semi-urban areas. Public health initiatives like the Sehat Sahulat Program (Sehat Card) have improved access for low-income populations by covering hospital expenses in many empaneled hospitals. While the city's healthcare infrastructure is advanced compared to other regions, disparities in quality, affordability, and access still persist, especially for vulnerable populations.

Table 6-6: Health Infrastructure Overview

Teaching Hospitals (Specialized Health	19
THQ Hospitals	01
Indus THQ Hospital	05
RHCs	05
BHUs	38
Rural Dispensaries	21
MCH Centers	50
Total	139

6.5.7 Economic Activity

The economy of Lahore has a diversified base, including telecommunications, information technology, manufacturing industry, engineering, pharmaceuticals, steel, chemicals, and construction material. The economy of Lahore is prosperous, as it is a major urban center. Lahore is one of the more industrialized districts of Pakistan and is home to the largest IT Park. in the country, which is called the Arfa Software Technology Park. Lahore is the country's second largest economic hub and also the commercial capital of Punjab. The Lahore Stock Exchange is Pakistan's second largest stock exchange, with the Karachi Stock Exchange being the largest.

Table 6-7: Economic activity of the area

Agriculture with its Allied Livestock Breeding, Fishing, Forestry	5.7%
Manufacture	9.6%
Construction	30%
Wholesale/ Retail, Hotel/ Restaurant	15.6%
Transport, Storage & Communication	6.7%
Community, Social & Personal Services	17.1%
Financing, Insurance, Real Estate	5.4%
Activities not adequately defined	9.4%
Electricity, Gas & Water	0.5%

6.5.8 Economic Infrastructure

The district is linked with Sheikhupura, Gujranwala, Okara, Kasur, and Narowal districts through metalled roads. The main Peshawar-Karachi railway line passes through Lahore District, and it is linked with Sheikhupura, Narowal, Gujranwala, and Kasur Districts through the railway network. District Amritsar of India is also connected by rail with Lahore for international traffic only. Lahore Transport Company (LTC) was established in 1984 to ease the traffic congestion in Lahore and improve bus services. LTC was given all the transport responsibilities of Lahore in December 2009. A Bus Rapid Transit System (BRTS) fleet of 650 buses was introduced, and named TransLahore. However, the BRTS did not have dedicated lanes and had to share the roads with regular traffic, with no right-of-way privileges. This resulted in a system that was a BRTS only in name. The Lahore Metro Bus Service was inaugurated on 10 February 2013. The first section consists of a 27 km road track, from Gajumata to Shahdara. It has 27 bus stations and incorporates e-ticketing.

Total Road length	1,309.93 km
National Highways	48.43 km
Provincial Highways	1261.5 km

6.5.9 Religion

The religious composition of the district is as follows:

Muslims	93.9%
Christians	5.8%
Hindus	Negligible %
Ahmadis	0.2%
Scheduled Castes	Negligible %
Others	Negligible %

6.5.10 Ethnic Structure

Cast	Percentage	Numbers
Kamboh	05	0.55 million
Rajput	05	0.55 million
Miscellaneous	20	2.23 million
Kashmiris	30	3.33 million
Arain	40	4.45 million

6.5.11 Site Suitability

Based on the environmental and socio-economic baseline of Lahore, it is concluded that the selected site within the Sundar Industrial Estate (SIE) is highly suitable for the establishment and operation of the M/S Nice Chain Co. Private Limited. manufacturing facility. The location is strategically integrated within a premier, purpose-built industrial zone, ensuring seamless accessibility through existing heavy-vehicle road networks and proximity to specialized industrial supply chains. This industrial setting enhances operational efficiency and the reliability of logistical distribution throughout the province.

The site is free from ecologically sensitive areas and does not fall within any protected habitat or wildlife reserve, thereby minimizing significant biological concerns. In addition, the surrounding land use is strictly industrial, which is inherently compatible with heavy manufacturing infrastructure and regulatory requirements. The selection of this site also ensures compliance with high safety standards, ease of specialized maintenance, and optimal logistics for the transport of industrial chain products, making it both technically and environmentally appropriate for the proposed project.



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7 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND ITS MITIGATION MEASURES

Potential impacts arising from design, construction and operation of the proposed project have been identified and assessed on the basis of primary and secondary data, expert opinion and by examining previous similar projects in Pakistan.

The impact screening matrices during development phases i.e. project design; construction and operation are presented below.

7.1 Methodology for Impact Screening

The methodology for assessing the risk level associated with each potential impact is presented below. Risk has been assessed as the likelihood that the activity will have an effect on the environment as well as the consequence of the effect occurring.

$$\text{Risk} = \text{Likelihood} \times \text{Consequence}$$

Likelihood Scale

Likelihood	Definition	Scale
Certain	Will certainly occur during the activity at a frequency greater than every week if preventative measures are not applied.	5
Likely	Will occur more than once or twice during the activity but less than weekly if preventive measures are not applied.	3
Unlikely	May occur once or twice during the activity if preventive measures are not applied.	2
Rare	Unlikely to occur during the project.	1

Consequence Scale

Consequence	Definition	Score
Catastrophic	The action will cause unprecedented impacts.	5
Major	The action will cause major adverse impacts.	3
Moderate	No or minimal impacts.	2
Minor	No or minimal impacts.	1

Risk Score Table

Likelihood	Consequence				
		Catastrophic	Major	Moderate	Minor
	Certain	25	15	10	5
	Likely	15	9	6	3
	Unlikely	10	6	4	2
	Rare	5	3	2	1

Risk:
Significant: 15-25
Medium: 6-10
Low: 1-5

Any 'Medium' to 'Significant' risk requires an environmental management measure to manage the potential environmental risk. Judgment will be required concerning the application of an environmental management measure to mitigate low risk situations.

7.2 Design/Pre-Construction Phase

7.2.1 Impact Screening Matrix

The screening of potential impacts during the design/pre-construction phase is provided in Table 6.1 below.

Table 7-1: Screening of Possible Impacts during Design/Pre- Construction Phase

Sr. No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
1	Inadequate site drainage design leading to future waterlogging	Unlikely	Moderate	Medium	Long Term
2	Improper zoning compliance for industrial activity	Rare	Major	High	Long Term
3	Omission of fire safety protocols in the facility design	Unlikely	Major	Medium	Long Term
4	Lack of detailed Waste Management Plan (WMP) for operations	Likely	Moderate	Medium	Long Term
5	Inefficient layout increasing energy demand and resource usage	Likely	Minor	Low	Long Term
6	Inaccurate assessment of raw material storage safety requirements	Unlikely	Moderate	Medium	Long Term

7.2.2 Inadequate site drainage design leading to future waterlogging

Impacts:

Inadequate drainage can result in the accumulation of stagnant water during peak monsoon seasons. This leads to structural degradation of foundations, corrosion of heavy machinery bases, and potential disruption of logistical activities within the Sundar Industrial Estate.

Mitigation Measures:

- Design a robust surface drainage network with adequate gradient towards the main industrial estate disposal points.
- Install perimeter swales and catch basins to manage storm-water runoff effectively.
- Regularly clear drainage channels to prevent siltation

Residual Impact:

- **Low;** dependent on consistent maintenance of the drainage network.

7.2.3 Improper zoning compliance for industrial activity

Impacts: Failure to align with industrial zoning regulations can lead to legal penalties, suspension of operations by regulatory authorities, and forced relocation, resulting in significant financial loss and project delays.

Mitigation Measures:

- Ensure all project layouts are pre-approved by the Punjab EPA and estate management.
- Maintain updated compliance records for land-use classification.

Residual Impact:

- **Low;** ensured through strict adherence to regulatory filing requirements.

7.2.4 Omission of fire safety protocols in the facility design

Impacts

The absence of comprehensive fire safety measures poses a severe threat to human life and the facility's structural integrity. Given the nature of heat treatment and industrial furnaces, a fire outbreak could result in catastrophic asset loss.

Mitigation Measures:

- Install automated fire suppression systems (sprinklers/gas-based) in furnace and storage areas.
- Design clearly marked emergency exits and evacuation routes.
- Conduct periodic fire drills and maintain readily accessible fire extinguishers.

Residual Impact:

- **Low;** maintained through routine safety audits and staff training..

7.2.5 Lack of detailed Waste Management Plan (WMP) for operations

Impacts

The Without a formal WMP, industrial waste including hazardous lubricants and metal shavings may be disposed of improperly, contaminating local soil and groundwater and violating environmental protection laws.

Mitigation Measures:

- Develop a comprehensive WMP categorizing waste streams (hazardous vs. non-hazardous).
- Establish dedicated, bunded storage areas for industrial waste pending off-site disposal.
- Partner with certified third-party waste disposal services.

Residual Impact:

- **Low;** managed through effective documentation and waste tracking.

7.2.6 Inefficient layout increasing energy demand and resource usage

Impacts

A disorganized production flow increases material handling time and energy consumption for logistics and machinery, leading to higher operational costs and an unnecessary increase in the facility's carbon footprint.

Mitigation Measures:

- Optimize the facility floor plan to minimize the distance between raw material storage, production lines, and shipping areas.
- Implement energy-efficient lighting and high-performance motors for all heavy machinery.

Residual Impact

Low; requires periodic operational audits to maintain layout efficiency.

7.2.7 Disruption Inaccurate assessment of raw material storage safety requirement

Impacts

Improper storage of raw metal materials and chemical agents can lead to environmental leaching, degradation of materials, or hazardous chemical reactions, compromising both product quality and worker safety.

Mitigation Measures

- Construct climate-controlled and moisture-proof storage facilities for sensitive raw materials.
- Implement strict material handling protocols based on Material Safety Data Sheets (MSDS).

Residual Impact

Low; temporary and ceases upon completion of the installation phase.

7.3 Impacts during Construction Phase

The detailed risk Matrix of Construction phase is shown in the table.

Table 7-2: Risk Matrix of Construction phase

S/No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
1.	Dust generation from site preparation and earthworks	Likely	Moderate	Medium	Short Term
2.	Noise pollution from heavy machinery and construction activity	Likely	Minor	Low	Short Term
3.	Improper disposal of construction debris and waste materials	Unlikely	Moderate	Medium	Long Term
4.	Traffic congestion due to machinery mobilization and logistics	Likely	Minor	Low	Short Term

S/No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
5.	Soil compaction and alteration of drainage patterns	Unlikely	Moderate	Low	Long Term
6.	Occupational safety risks to workers during structure assembly	Likely	Moderate	Medium	Short Term
7.	Accidental spills of fuel or construction-related chemicals	Unlikely	Major	Medium	Long Term
8.	Depletion of local water resources for construction needs	Possible	Minor	Low	Short Term
9.	Potential damage to existing site infrastructure/nearby utility lines	Rare	Major	Medium	Long Term
10.	Loss of vegetation or site clearing impacts on local biodiversity	Unlikely	Minor	Low	Long Term
11.	Socio-economic impacts on local labor/employment opportunities	Likely	Minor	Low	Short Term

7.3.1 Dust generation from site preparation and earthworks

Impacts

- Earthworks release airborne particulate matter (PM₁₀ and PM₂₅₀), which degrades local air quality and poses respiratory health risks to workers and nearby personnel.

Mitigation Measures

The following measures will be implemented:

- Implement regular water sprinkling on unpaved surfaces and haul roads to suppress dust.
- Cover all stockpiles of loose construction materials with tarpaulins.
- Enforce speed limits for vehicles within the site to minimize dust mobilization.

Residual Impacts

- Low**; managed through daily site operational protocols.

7.3.2 Noise pollution from heavy machinery and construction activity

Impacts

High-decibel noise from machinery and tools can cause auditory stress to workers and disturb operations in adjacent industrial units within the Sundar Industrial Estate.

Mitigation Measures

The following measures will be implemented:

- Restrict noisy construction activities to daylight hours.
- Equip heavy machinery with high-efficiency silencers and maintain equipment regularly.
- Provide workers with appropriate Personal Protective Equipment (PPE), such as earplugs or earmuffs.

Residual Impacts

- **Low**; controlled by strictly adhering to working time schedules.

7.3.3 Improper disposal of construction debris and waste materials

Impacts

Accumulation of waste creates aesthetic blight, occupies valuable site space, and increases the risk of contamination if debris contains hazardous residues.

Mitigation Measures

The following measures will be implemented:

- Segregate waste at the source into recyclable and non-recyclable streams.
- Contract with authorized waste management service providers for off-site disposal.

Residual Impacts

- Low; ensured through proper waste tracking and documentation.

7.3.4 Traffic congestion due to machinery mobilization and logistics

Impact

Increased movement of heavy transport vehicles can cause bottlenecks on roads leading to the Sundar Industrial Estate, disrupting local industrial logistics.

Mitigation Measures

The following measures will be implemented:

- Schedule deliveries of heavy machinery and construction materials during off-peak traffic hours.
- Employ traffic marshals to manage ingress and egress at the site entrance.

Residual Impacts

- Low; managed through effective logistical planning.

7.3.5 Soil compaction and alteration of drainage patterns

Impacts

Movement of heavy machinery compresses the soil, reducing porosity and potentially altering natural site drainage, leading to localized flooding.

Mitigation Measures

The following measures will be implemented:

- Restrict machinery movement to designated temporary haul roads to minimize compaction.
- Implement a temporary drainage system during construction to prevent runoff accumulation.

Residual Impact:

Medium; requires monitoring post-earthworks

7.3.6 Occupational safety risks to workers during structure assembly

Impacts

- Working at heights, manual handling of heavy structural elements, and use of power tools pose significant risks of injury to the construction workforce.

Mitigation Measures

The following measures will be implemented:

- Mandate the use of full-body harnesses, helmets, and steel-toed boots for all workers.
- Conduct daily "toolbox talks" regarding safety hazards before starting work.

Residual Impacts

- **Low;** maintained through rigorous safety supervision..

7.3.7 Accidental spills of fuel or construction-related chemicals

Impacts

- Spills can penetrate the soil surface, contaminating localized groundwater and soil, causing long-term environmental degradation.

Mitigation Measures

The following measures will be implemented:

- Store fuels and chemicals in secondary containment (bunded) areas.
- Maintain spill kits containing absorbent materials on-site for immediate response.

Residual Impact:

- Low; managed through quick response training.

7.3.8 Depletion of local water resources for construction needs

Impacts

Excessive consumption of groundwater for curing and dust suppression may lower the water table, affecting nearby industrial operations.

Mitigation Measures:

- Utilize treated wastewater or recycled water for dust suppression and concrete curing where possible.
- Install flow meters to monitor and limit water usage.

Residual Impact:

- Low; controlled by resource management protocols.

7.3.9 Potential damage to existing site infrastructure/nearby utility lines

Impacts:

- Excavation activities may accidentally rupture buried utility lines (electricity, water, or data cables) within or adjacent to the site.

Mitigation Measures:

- Obtain and verify underground utility maps from the industrial estate management before breaking ground.
- Use manual excavation methods in areas where utility lines are identified.

Residual Impact:

- Low; ensured through careful pre-construction site surveys.

7.3.10 Loss of vegetation or site clearing impacts on local biodiversity

Impacts

- While the site is industrial, clearing of existing patches of vegetation results in a loss of local green cover and small-scale habitats.

Mitigation Measures:

- Limit clearing to the minimum required footprint for the building structure.
- Implement a post-construction landscaping plan to replant native vegetation around the facility perimeter.

Residual Impact:

- Low; mitigated by replanting initiatives

7.3.11 Socio-economic impacts on local labor/employment opportunities

Impacts

The construction project brings both positive (local job creation) and negative (potential influx of outside labor) socioeconomic pressures.

Mitigation Measures:

- Prioritize hiring local labor for unskilled and semi-skilled construction roles to benefit the local community.
- Ensure all temporary housing for laborers meets basic sanitation and safety standards.

Residual Impact:

- Positive; contributes to local skill development.

7.4 Impacts during Operational Phase

Table 7-3: Risk Matrix of Operational Phase
Screening of possible Impacts during Operational Phase

S/No.	Potential Issue	Likelihood	Consequence	Risk Level	Residual Impact
1	Air emissions (particulate matter/fumes) from Heat Treatment furnaces	Likely	Moderate	Medium	Long Term
2	Soil and groundwater contamination from spent quenching oil/lubricants	Likely	Major	High	Long Term
3	Noise pollution generated from heavy-duty Power Presses and machinery	Likely	Moderate	Medium	Long Term
4	Hazardous waste generation (metal shavings, oily rags, contaminated grease)	Likely	Moderate	Medium	Long Term
5	Occupational health risks to staff from chemical/oil skin exposure or inhalation	Likely	Moderate	Medium	Short Term
6	Increased energy demand placing pressure on the industrial estate's grid	Possible	Minor	Low	Long Term
7	Wastewater effluent discharge containing suspended solids and oil traces	Possible	Moderate	Medium	Long Term
8	Fire hazards due to the storage of flammable materials (oils, grease, alloy steel)	Unlikely	Major	Medium	Short Term
9	High-temperature thermal discharge from shot blasting and heat treatment units	Possible	Minor	Low	Short Term
10	Traffic increase due to daily heavy logistics and product transport	Likely	Minor	Low	Long Term
11	Potential for accidental spills during bulk oil and chemical storage/transfer	Possible	Moderate	Medium	Long Term

7.4.1 Air emissions (particulate matter/fumes) from Heat Treatment furnaces

Impacts

High-temperature furnace operations release particulate matter and process fumes, which can degrade local air quality within the Sundar Industrial Estate.

Mitigation Measures

- Install high-efficiency scrubbers and electrostatic precipitators on furnace exhaust stacks to capture particulates.
- Conduct regular stack emission monitoring to ensure compliance with Punjab EPA standards.

Residual Impacts

- Low; managed through routine system maintenance and air quality monitoring.

7.4.2 Soil and groundwater contamination from spent quenching oil/lubricants

Impacts

Inadequate containment of spent quenching oils and lubricants during metal processing can lead to soil and groundwater contamination.

Mitigation Measures

Following mitigation measures will be implemented:

- Use double-walled storage tanks and concrete-bunded areas for all liquid chemical and oil storage.
- Implement a rigorous leak detection and preventative maintenance schedule for piping systems.

Residual Impacts

- Low; ensured through engineering controls and secondary containment.

7.4.3 Noise pollution generated from heavy-duty Power Presses and machinery

Impacts

Continuous operation of power presses creates high-decibel noise, impacting the well-being of operators and the surrounding industrial environment.

Mitigation Measures

Following mitigation measures will be implemented:

- Install acoustic enclosures and vibration-damping mounts for all heavy-duty power presses.
- Rotate staff shifts to limit individual exposure to high-noise areas and provide mandatory hearing protection (PPE).

Residual Impacts

- Low; managed by limiting noise transmission at the source.

7.4.4 Hazardous waste generation (metal shavings, oily rags, contaminated grease)

Impacts

Accumulation of industrial hazardous waste, if mismanaged, poses significant risks to soil health and regulatory standing.

Mitigation Measures:

- Categorize all waste streams into hazardous and non-hazardous; store in clearly labeled, fire-rated containers.
- Contract only with government-approved hazardous waste management facilities for final disposal.
- **Residual Impact:** Low; tracked through a comprehensive waste registry and disposal manifest system.

7.4.5 Occupational health risks to staff from chemical/oil skin exposure or inhalation

Impacts

Chronic exposure to industrial lubricants and furnace emissions poses risks of respiratory issues and dermatological conditions for facility personnel.

Mitigation Measures:

- Mandate the use of specialized gloves, masks, and protective clothing when handling chemicals.
- Install localized exhaust ventilation systems at all workstations where fumes or oil mists are generated.

Residual Impact:

- Low; maintained through consistent safety audits and health check-ups.

7.4.6 Increased energy demand placing pressure on the industrial estate's grid

Impacts

High energy requirements for furnaces and heavy machinery can strain the local power infrastructure of the industrial estate.

Mitigation Measures:

- Implement energy-efficient motor controllers and high-performance equipment to minimize power consumption.
- Explore potential for on-site renewable energy integration to reduce grid dependency.

Residual Impact

Medium; requires periodic energy consumption audits.

7.4.7 Wastewater effluent discharge containing suspended solids and oil traces

Impacts

Discharge of untreated wastewater containing suspended solids and oil traces directly into the estate's drainage system threatens local water bodies and contravenes environmental regulations.

Mitigation Measures:

- Construct an on-site primary treatment unit, including oil-water separators and sedimentation tanks.
- Regularly sample and test treated effluent to verify it meets environmental discharge limits.

Residual Impact

- Low; controlled by rigorous effluent quality monitoring.

7.4.8 Fire hazards due to the storage of flammable materials (oils, grease, alloy steel)

Impacts

- The presence of flammable quenching oils and metal alloys in high-temperature environments creates a persistent risk of fire and potential structural failure.

Mitigation Measures:

- Store flammable materials in segregated, fire-proof zones equipped with automated fire suppression systems (e.g., CO2 or foam-based)
- Equip all furnace areas with thermal sensors and automated shut-off systems.

Residual Impact

- Low; maintained through regular emergency drills and fire safety inspections

7.4.9 High-temperature thermal discharge from shot blasting and heat treatment units

Impacts

- Direct release of heat into the workspace or external environment affects ambient temperatures and may impact worker comfort and energy cooling loads.

Mitigation Measures:

- Implement heat exchangers to capture and reuse thermal energy for secondary processes.
- Ensure proper facility ventilation and thermal insulation of furnace shells to reduce heat transfer to the environment.

Residual Impact

Low; managed through insulation and heat recovery.

7.4.10 Traffic increase due to daily heavy logistics and product transport

Impacts

Consistent transport of raw alloy steel and distribution of finished chain products increases traffic load, causing potential delays and wear on estate infrastructure.

Mitigation Measures:

- Optimize logistical planning to consolidate shipments, reducing the total number of vehicle trips.

- Manage vehicle entry/exit protocols to avoid peak hours within the industrial zone.

Residual Impact

Low; mitigated by logistical efficiency measures.

7.4.11 Potential for accidental spills during bulk oil and chemical storage/transfer

Impacts

Failures during the transfer of bulk fluids can lead to sudden, high-impact environmental contamination events.

Mitigation Measures:

- Utilize automated pumping systems with shut-off valves to prevent overfilling.
- Maintain "Spill Response Kits" containing absorbents and barriers near all transfer points and conduct staff response training.

Residual Impact

Low; managed through preventative training and containment infrastructure.

7.5 Potential Environmental Enhancement Measures

As described above the worth mentioning wastes will be sewage and solid waste in the plant in the form of waste iron/melts etc of the project. In order to enhance environment the following equipment will be installed:

7.5.1 Air Pollution Control System

Working Principle

- Air Blower (Induced Draft Fan) creates negative system pressure
- Fume Hood collects polluted gas
- Collected gas is forced into Gravity Chamber #1 where most of heavy dust particles are collected
- Gravity Chamber #2 collects remaining heavy dust particles
- Cyclone creates air vortex to collect medium dust particles
- Fine dust particles are collected in the Bag house having appropriate filter media
- Bag house media is periodically cleaned by blowing compressed air in reverse
- Clean, pollution free gas is discharged into the atmosphere by Air Stack

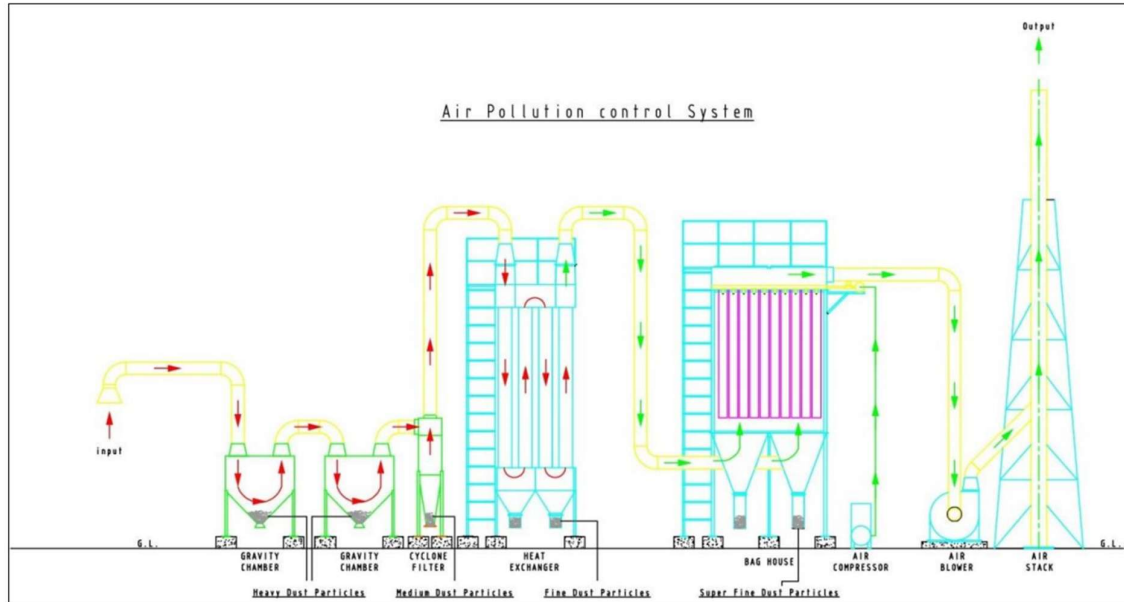


Figure 7-1: Air Pollution Control system

7.5.2 Water Management

- Rain water disposal will be done through adequate system to be provided at all levels of the building.
- Sewage will be discharged to the main sewerage system; after its treatment as recommended in this EIA report; and also getting the permission from the competent authority.
- A tentative summary flow sheet (sketch) of the effluent treatment process is following

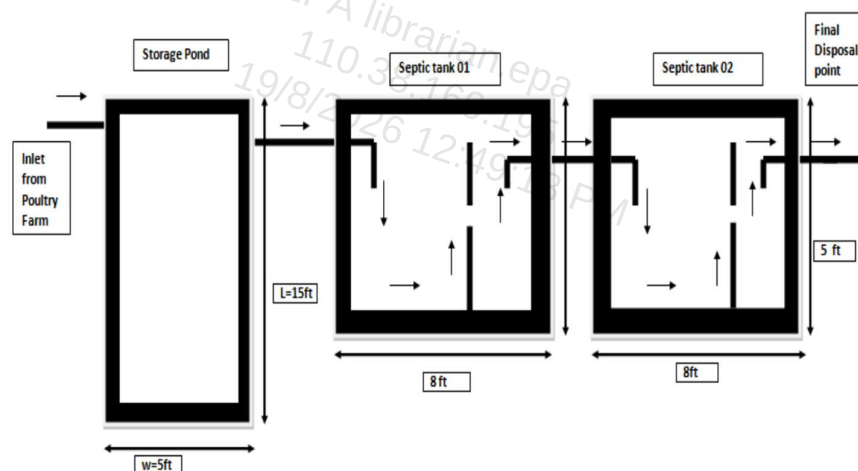


Figure 7-2: Septic Tank

The project will ensure a reliable power supply to maintain continuous production and safety systems:

- **Primary Power:** Electricity will be sourced from WAPDA with a total connected load of 450 kW to meet the operational demands of the production line.
- **Backup Power:** A 350 kVA Diesel Generator will be maintained as a standby source for use during power outages to ensure critical equipment, such as the air pollution control system, remains operational.
- **Noise Mitigation:** The standby generator will be housed in a double-built acoustic containment unit, ensuring noise emissions remain well within the limits of Punjab Environmental Quality Standards (PEQS)
- **Emission Control:** Due to the infrequent and short-duration usage of the standby generator, gaseous emissions and particulate matter (PM) generation will be negligible.

Safety, Privacy, and Aesthetics

- **Fire Safety Readiness:** An adequate fire-fighting system will be maintained at all times, with the required volume of water kept in dedicated storage to ensure immediate response.
- **Architectural Integration:** The visual impact of the building and its surroundings has been carefully considered to ensure the facility aligns with the industrial aesthetics of the Sundar Industrial Estate.
- **Land Use & Privacy:** The site layout is designed to ensure that operational activities do not infringe upon the privacy of adjoining industrial units or buildings.

7.5.3 Baseline Environmental Monitoring

To establish the existing environmental status of the M/S Nice Chain Co. Private Limited. project site, a comprehensive on-site monitoring program was conducted:

- **Ambient Air Quality:** Monitoring was performed to assess levels of gaseous emissions, specifically Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x), and Carbon Monoxide (CO).
- **Particulate Matter & Noise:** Baseline concentrations of particulate matter (PM) and ambient noise levels were measured to define existing conditions before project commencement.
- **Water Quality:** The quality of the local groundwater supply was determined through standardized laboratory testing of samples collected from the site's underground water system to ensure it meets health and safety requirements.

7.5.4 Impacts on Socio-Economic Environment

The project has no negative socio-economic impacts rather it has positive impacts on the local community.

8 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

An Environmental Management and Monitoring Plan (EMMP) is a comprehensive and systematic approach designed to effectively control, mitigate, and assess the impacts of industrial activities on the environment. The overarching goal of this program is to safeguard, preserve, and enhance environmental quality, ensuring the sustainable use of natural resources. This holistic strategy emphasizes the importance of environmental protection while underscoring the imperative of responsible resource management for the benefit of current and future generations. The Environmental Impact Assessment (EIA) identifies the potential impacts of establishing the M/S Nice Chain Co. Private Limited. manufacturing facility at the Sundar Industrial Estate, Lahore. It evaluates both positive and negative effects across all project stages including design, construction, and long-term operation—to ensure the facility is environmentally sustainable and socially acceptable within the industrial framework of the region.

Mitigation measures recommended in this EMMP are based on environmental sensitivities, applicable laws such as the Punjab Environmental Protection Act, and international best practices for high-precision industrial manufacturing. The EMMP serves as a definitive guideline for contractors, engineers, and stakeholders to minimize adverse impacts during the installation of production lines and daily operations. It ensures that the manufacturing of high-strength industrial chain products does not harm the surrounding industrial or residential environment. Furthermore, this EMMP forms an integral part of the project documentation for effective environmental management, monitoring, and total regulatory compliance.

8.1 Environmental Management Plan (EMP)

The Environmental Management Plan (EMP) designed for the M/S Nice Chain Co. Private Limited. project ensures a structured approach to environmental stewardship and regulatory adherence. The EMP will ensure the following:

- **Delivery of Prescribed Outcomes:** Ensure the delivery of prescribed environmental outcomes during the design, construction, and operational phases of the chain manufacturing facility.
- **Legislative Compliance:** Formulate a systematic framework for total compliance with the Punjab Environmental Protection Act and PEQS (Punjab Environmental Quality Standards) requirements and obligations.
- **Sustainable Design:** Ensure that the project incorporates environmentally sound design and sustainability principles, such as energy-efficient heat treatment systems and optimized furnace technology, to minimize potential impacts on the Sundar Industrial Estate environment and community.
- **Impact Minimization:** Ensure that construction and manufacturing work procedures are optimized to minimize potential impacts, including noise, dust, and hazardous metal waste, on the surrounding environment and industrial workforce.
- **Pollution Control and Resource Optimization:** Develop, implement, and monitor specific measures that minimize pollution—particularly industrial effluent and waste oils while optimizing the use of energy and raw material resources throughout the facility's lifecycle.

8.2 Structure of EMP

The structure of the EMP will:

- Describe that how it fits into the overall planning process for the project
- Detail the activities that are to be carried out
- Identify the impacts of activities may have on environment
- Propose environmental control methods to be used to prevent or minimize those environmental impacts
- Assign responsibility for each control measure to specific staff members
- Identify key monitoring parameters and schedule of monitoring of these parameters
- Identify training requirements at various stages of the development of the project
- Identify the resources required to implement the EMP and outline relevant expenses

8.3 Project Implementation Institutional Requirements

The following organizations would be involved in the implementation of the proposed EMP;

- M/s Nice Chain co. (Pvt.) Ltd. as the proponents of the project and owners of the EMP during construction and operation of the project.
- Project Contractor, as the executor of the EMP during construction stage of the project.
- Supervisory Consultant, as monitor of the execution of the EMP during construction stage.
- Environmental Protection Agency (EPA), Punjab, as Government Department to review and monitor the implementation of remedial and mitigation measures as given in EIA.

8.4 Environmental Management Team Along With Their Roles and Responsibilities

List of members that shall be part of environmental management team are mentioned in **table below**:

ENV. MANAGEMENT TEAM	ROLES	RESPONSIBILITIES
Project Manager	Supervisor.	• To plan, disseminate, implement and continuously develop the environmental management system according to the policy. • To monitor and assess the implementation of the committees' environmental management system.
Health and Safety Officer	Member	• The role typically involves preparing health and safety strategies and developing policies carrying out risk assessments;

ENV. MANAGEMENT TEAM	ROLES	RESPONSIBILITIES
		- liaising with regulatory authorities to ensure compliance with mandatory regulations - investigating accidents on sites and producing subsequent reports and recommendations; and carrying out site inspections to check policies and procedures are being properly implemented.
Process Control Engineer	Member	Optimize processes and implement quality control systems in the industry. They design, test, and oversee the implementation of new processes. They are often employed at manufacturing/processing plants that process chemicals, metals, and other materials.
Head of the Audit department	Member	Developing testing methodologies to evaluate the adequacy of controls. Documenting the results of the evaluations. Developing recommendations and reports based on audits and presenting these ideas to senior Management.
Other Industry members as the Superintendent may designate.	Member	Oversee day-to-day field activities. Supervise the activities of subcontractors and subordinate staff

8.5 Proposed EMP Reporting and Reviewing Procedures

This section defines the institutional responsibilities for M/S Nice Chain Co. Private Limited., contractors, local authorities, and the Environmental Protection Agency (EPA) regarding the management of environmental performance. It outlines the clear roles required to prepare, submit, receive, review, and approve environmental compliance reports.

8.6 Institutional Responsibilities

- **M/S Nice Chain Co. Private Limited. (Proponent):** Responsible for overall EMP implementation, ensuring that environmental mitigation measures are integrated into daily operations and that all monitoring reports are submitted to regulatory bodies on time.
- **Contractors:** Tasked with the execution of site-specific mitigation measures during the construction and installation phases, and responsible for reporting any non-compliance or environmental incidents to the proponent immediately.

- **EPA (Environmental Protection Agency):** Acts as the primary regulatory authority to receive, review, and grant approval for monitoring reports, ensuring that the facility maintains compliance with the Punjab Environmental Quality Standards (PEQS).
- **Local Authorities:** Provide necessary oversight and support to ensure that project activities remain in alignment with local zoning laws and industrial facility requirements.

8.7 Implementation Schedule & Reporting Framework

An implementation schedule will be established to detail the timing, frequency, and duration of all required mitigation measures and environmental monitoring activities. This schedule will demonstrate phasing and ensure full coordination with the facility's operations manual and any applicable loan agreements.

- **Reporting Recipients:** Reports will be distributed to management personnel and technical leads responsible for the timely execution of mitigation measures and the initiation of any necessary remedial actions.
- **Report Structure and Content:** The content and submission timing of these reports are strictly specified to facilitate efficient supervision and technical review by the EPA.
- **Review and Approval:** All submitted documentation will undergo a formal review process to confirm that environmental safeguards are effective and to secure EPA approval, where required, for ongoing facility operations.

8.8 Review and Update

The EMP is intended to be dynamic and will be reviewed as often as necessary in accordance with changes to:

- Selected technologies or equipment
- Operational activities
- The legislative environment and/or approval conditions
- Improvements in best practice environmental management
- Corrective actions implemented as a result of complaints, incidents or non-conformance situation
- Audit Report recommendations

8.9 Training Requirements for EMP and Monitoring Implementation

To ensure the effective implementation of the Environmental Management Plan (EMP) and monitoring protocols at M/S Nice Chain Co. Private Limited., a structured training program is mandatory. All staff, plant operators, and third-party contractors will receive comprehensive induction training regarding their specific duties and responsibilities associated with the project's industrial activities and the requirements of the EMP.

8.10 Induction Training Components

At a minimum, the environmental component of the induction will address the following project-specific areas:

- **General Environmental Duty & Duty to Notify:** Training on the legal obligations under the Punjab Environmental Protection Act, emphasizing the mandatory requirement to notify authorities in the event of environmental harm or accidental spills.
- **Project-Specific Environmental Risks:** Instruction on the unique hazards associated with chain manufacturing, including handling quenching oils, lubricant storage, furnace emissions, and metal dust management.
- **EMP Requirements:** Detailed explanation of the EMP procedures, including the operation of the air pollution control system, waste disposal protocols, and noise mitigation measures.
- **Emergency Response & Contact Info:** Clear guidance on emergency procedures, including the use of fire suppression systems and the contact information for site safety officers and regulatory authorities.

8.11 Continuous Training & Awareness

To maintain a high standard of environmental compliance throughout the operational lifecycle of the project, relevant environmental issues will be reinforced through:

- **Regular Tool-Box Talks:** Brief, frequent sessions held during shift changes to reinforce the importance of following safety protocols.
- **Safety Drills:** Scheduled drills for fire emergencies and chemical/oil spills to ensure staff are proficient in emergency response procedures.
- **Refresher Training:** Periodic sessions to update employees on any changes to regulatory requirements or modifications to production processes.

Table 8-1: Key Environmental Management Actions

Phase / Aspect	Environmental Problem / Impact	Mitigation Measure
Project Location	Physical, socioeconomic, and ecological setting impacts.	Impacts are determined to be largely insignificant in nature.
Project Design	Potential environmental impact and local aesthetic value.	Prioritize adherence to environmental standards and carefully consider aesthetic values.
Construction (Pollutants)	Soil erosion, accumulation of debris (sand, stone, plastic, metal, rags).	Implement waste segregation and proper disposal protocols.
Construction (Air Quality)	Emissions of PM ₁₀ , smoke, dust, CO, and NO _x .	Mandatory vehicle tuning, maintenance of diesel equipment, covering transport trucks with tarpaulin, and water sprinkling on unpaved surfaces.
Construction (Noise/Vib)	Noise and vibration from machinery (batching plants, excavators, generators).	Use mufflers/silencers, install noise barriers, and restrict noisy operations during nighttime hours.

Phase / Aspect	Environmental Problem / Impact	Mitigation Measure
Construction (Other)	Fugitive dust (75 lb/vehicle-mile), utility infrastructure impacts, and social influx.	Water sprinkling to suppress dust; enforce strict safety/infrastructure protocols for labor.
Operation (Emissions)	Gaseous emissions and noise from standby generators and metal recycling.	Limit generator use to power outages; use flue-to-air heat exchangers, baghouse dust collectors, and ID fans.
Operation (Infrastructure)	Flue gas conveyance and release.	Aerodynamically designed ducts with cleaning mechanisms; release treated gases via an 80-foot stack.
Operation (Waste)	Generation of solid waste (scrap metal, dust).	Analyze and sell scrap to vendors; use automated systems to collect dust in silos and recycle flue gases.

8.12 Schedule for Implementation of Environmental Management Plan

The schedule for the implementation of the Environmental Management Plan (EMP) outlines a systematic timeline for executing key environmental management activities throughout the project. The schedule is designed to ensure the effective integration of environmental safeguards at various stages. The typical schedule may include:

Table 8-2: Schedule for Implementation of Environmental Management Plan (EMP)

Phase	Key Activities Specific to Chain Manufacturing	Responsibility
Pre-Construction	- Baseline soil and groundwater testing at Plot 759, 760, 762 to establish pre-operational benchmarks. - Finalize EMP addressing specific risks of metal processing and oil storage.	Proponent, Consultant
Construction	- Install silt fencing and sediment traps during excavation for heavy press foundations. - Implement dust control for site leveling and construction of the furnace housing area.	Contractor, EHS Officer
Commissioning	- Install flue-gas scrubbers and cyclone collectors on heat treatment stacks. - Calibrate automated oil-water separators in the quenching zone.	Contractor, EHS Officer

Phase	Key Activities Specific to Chain Manufacturing	Responsibility
Trial Run	- Conduct "dry" runs of precision power presses to test acoustic enclosure effectiveness. - Verify thermal discharge rates from heat treatment units against design parameters.	Proponent, EHS Officer
Operational	- Daily monitoring of baghouse dust collection performance for metal fines. - Weekly inspection of bunded areas for quenching oil and lubricant storage. - Systematic collection and sale of steel/alloy scrap to certified vendors.	Facility Operator, EHS Team
Monitoring & Reporting	- Quarterly stack emission testing (PM, NO_x, CO) per Punjab-EPA standards - Monitoring of effluent quality from the oil-water separator before drainage discharge.	EHS Officer, Third-party Lab
Decommissioning	- Safe decommissioning and decontamination of quenching oil tanks and furnace internals - Inventory and disposal of all accumulated hazardous oily waste and metal scrap.	Contractor, EHS Officer
Post-Construction	- Landscaping the facility perimeter to offset construction-phase vegetation loss. - Finalizing site restoration and soil quality verification.	Proponent, Consultant
External Validation	- Annual third-party audit of furnace emission systems and chemical storage protocols. - Documenting resolution of any industrial community grievances regarding noise or traffic.	Independent Auditor, Proponent
Project Closure	- Final audit of waste disposal manifests for all hazardous metal and oil waste. - Compiling environmental performance data for the Sundar Industrial Estate records.	Proponent, EHS Officer
Continuous Improvement	- Upgrading furnace heat recovery systems to improve energy efficiency. - Implementing new green-lubricants to reduce the hazardous profile of quenching waste.	Proponent, EHS Officer

This schedule for EMP implementation is adaptable and subject to adjustments based on monitoring findings, changes in project scope, or regulatory requirements. It emphasizes a proactive and adaptive approach, ensuring that environmental management measures are not only implemented effectively but also continually refined to achieve the project's environmental objectives.

8.13 Environmental Management Cost

The costs for environmental management and monitoring during the construction and operation phases will be integrated into the contracts for all appointed contractors and consultants. To ensure the effective execution of the Environmental Management Plan (EMP), the project proponent, M/S Nice Chain Co. Private Limited., has allocated a total environmental budget of Rs. 250 Million. This budget covers the implementation of environmental safeguards for the initial two-year period. Following this period, the monitoring program will be revised in consultation with the Environmental Protection Agency (EPA), and the budget will be adjusted accordingly.

Table 8-3: Summary of EMP Cost

Sr. No	Parameters	Cost (Pak Rupees)
1.	Greenbelt Development	0.75 Million
2.	Solid Waste Management	0.25 Million
3.	Health & Safety	0.25 Million
4.	Pollution Control System	1.25 Million
Total		250 Million

8.14 Environmental Monitoring Program

The monitoring program is designed to ensure that the requirements of the NOC awarded by the EPA are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause environmental disturbance. Following is a tentative plan for environmental monitoring;

Sr. No	Monitoring Parameter	Monitoring Location	Remarks / Regulatory Compliance	Monitoring Frequency
A. Construction Stage				
1.	Noise Levels	Civil works zones, fabrication areas, and temporary deployment sites.	Contractor will use calibrated sound-level meters to ensure construction noise remains within baseline limits.	Quarterly Basis
2.	Smoke Emissions	Construction vehicles, heavy machinery, and temporary backup generators.	Regular mechanical tuning and fitness certifications will be enforced to prevent heavy smoke opacity.	Quarterly Basis

Sr. No	Monitoring Parameter	Monitoring Location	Remarks / Regulatory Compliance	Monitoring Frequency
B. Operation Stage				
1.	Gaseous & Stack Emissions	Stacks of the Heat Treatment Furnace and standby utility generators.	Direct testing of combustion parameters (NO _x , CO, SO ₂ , and smoke opacity) via an EPA-certified laboratory to ensure strict compliance with Punjab Environmental Quality Standards (PEQS).	Quarterly Basis
2.	Ambient & Workplace Noise	Main production floor near the Power Press Machine, Chain Assembly Machine, Riveting Machine, Shot Blasting Machine, and the Air Compressor bay.	High-vibration areas will be monitored daily by internal HSE staff and cross-verified quarterly by a third-party laboratory to protect workers and maintain industrial zone limits.	Daily (Internal) / Quarterly (Third-Party)
3.	Industrial & Hazardous Waste	Dedicated chemical storage area and maintenance bays holding Quenching Oil, Lubricating Oil, and Grease.	Monitoring of secondary containment integrity to prevent soil/groundwater contamination, along with maintaining logbooks of spent oil volumes transferred to EPA-approved recyclers.	Monthly Basis
4.	Solid Waste & Scrap Metal	Central waste storage area and raw material handling zone (Steel Strip, Steel Wire Rod, and Alloy Steel scraps).	Tracking the daily segregation of domestic waste (60–70 kg/day) and confirming that high-value metallurgy punch-outs/scrap are safely stored for industrial recycling.	Monthly Basis
5.	Waste Water Monitoring	Final outlet/discharge point of the primary on-site Septic Tank.	Analytical testing of domestic effluent (pH, BOD ₅ , COD, TSS) prior to disposal, ensuring no process fluids or oils mix with the domestic stream, as per SMART rules.	Quarterly Basis
6.	Health & Safety (HSE) Compliance	Across all operation lines, specifically around the Shot Blasting	Daily safety audits ensuring the mandatory use of heavy-duty PPE (earmuffs near presses/compressors, dust masks near shot	Continuous / Monthly Reports

Sr. No	Monitoring Parameter	Monitoring Location	Remarks / Regulatory Compliance	Monitoring Frequency
		Machine and Testing Machine.	blasting, and safety glasses on assembly lines).	

8.15 Operation and Mitigation Phase

This section of EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedure and responsibilities are required from proponent within the operation and maintenance phase are satisfied considerations into technical designs. The EMP also covers site verification to avoid environmentally sensitive areas, planning for safe storage and handling of materials, and developing mitigation strategies for anticipated impacts. Additionally, this phase emphasizes meaningful stakeholder engagement, public disclosure of project-related information, and the establishment of grievance redress mechanisms. These actions are critical for identifying and addressing potential risks early, ensuring regulatory compliance, and setting a strong foundation for environmental management during construction and operation phases.



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8.16 Environmental Plan for Construction and Operation Phase

Table 8-4: Environmental Management Plan for Construction Phase

Sr. No.	Project Component / Impact	Mitigation / Preventive Action	Responsibility	
			Implementation	Monitoring
Construction Phase				
1	Degradation of air quality (Dust & Emissions)	- Water sprinkling on unpaved areas; cover material stockpiles - Ensure machinery complies with PEQS exhaust limits.	Construction	Proponent & Contractor
2	Soil erosion and industrial pavement damage	Restore service roads; provide temporary drainage channels to prevent runoff during foundation works.	Construction	Proponent & Contractor
3	Traffic management in SIE	- Schedule heavy machinery (presses/furnaces) mobilization during off-peak hours - Deploy flagmen for site access.	Construction	Proponent & Contractor
4	Safety risks to neighboring industrial units	- Fence the site with clear warning signage - Establish a Grievance Redressal Mechanism (GRM) for neighbors.	Construction	Proponent & Contractor
5	Occupational Health & Safety (OHS) hazards	- Mandate PPE - Conduct daily safety inductions for technical staff involved in high-elevation or electrical works.	Construction	Proponent & Contractor
6	High noise levels from civil/foundation works	- Limit noise-intensive piling to daytime - Use equipment with silencers; provide ear protection for site workers.	Construction	Proponent & Contractor

Construction of Industrial & Automotive Chain Manufacturing Facility
M/s Nice Chain Co. Private Limited.
Environmental Impact Assessment (EIA)

Sr. No.	Project Component / Impact	Mitigation / Preventive Action	Responsibility	
			Implementation	Monitoring
7	Improper waste handling (Debris/Packaging)	- Segregate metal scrap and chemical packaging - Engage certified waste contractors for disposal.	Construction	Proponent & Contractor
8	Management of temporary office effluent	- Equip temporary facilities with septic tanks - Test effluent for PEQS compliance.	Construction	Proponent & Contractor
9	Soil contamination from accidental spills	- Refuel machinery over impervious surfaces; maintain spill kits - Remove/dispose of contaminated soil at authorized sites.	Construction	Proponent & Contractor
10	Employment and social considerations	- Prioritize hiring qualified local labor - Enforce strict code of conduct and prohibit child labor.	Construction	Proponent & Contractor
11	Vegetation loss and site restoration	- Limit clearing to required footprint - Replant native species post-construction; remove temporary structures upon commissioning.	Construction	Proponent & Contractor
12	Archaeological Chance Finds	- Halt excavation immediately if artifacts are found - Coordinate with Punjab Department of Archaeology.	Construction	Proponent & Contractor

Table 8-5: Environmental Management Plan for Operational Phase

Sr. No.	Project Component / Impact	Mitigation / Preventive Action	Responsibility	
			Implementation	Monitoring
1	Emergencies or Plant Failure (Furnace/Power Press)	- Conduct regular infrared thermal imaging of furnace shells and electrical panels - Install automated fire suppression systems and fire-rated barriers between furnace zones and oil storage.	During Operational Phase	Proponent

Construction of Industrial & Automotive Chain Manufacturing Facility
M/s Nice Chain Co. Private Limited.
Environmental Impact Assessment (EIA)

Sr. No.	Project Component / Impact	Mitigation / Preventive Action	Responsibility	
			Implementation	Monitoring
2	Leakage of Industrial Lubricants/Quenching Oils	- Use high-integrity piping with regular pressure testing - maintain secondary containment designed to hold 110% of bulk oil volume - Install liquid sensors linked to the central control room.	During Operational Phase	Proponent
3	Chemical/Lubricant Exposure Risks	- Maintain restricted access zones for heat treatment and chemical quenching lines - Conduct periodic air quality monitoring to detect oil mists.	During Operational Phase	Proponent
4	Hazardous Waste (Metal Shavings/Oily Rags)	- Store oily rags, contaminated grease, and metal fines in sealed, labeled containers within bunded areas - Ensure disposal via EPA-approved industrial waste contractors.	During Operational Phase	Proponent
5	Noise Pollution (Presses & HVAC)	- Periodically monitor boundary noise levels - service furnace fans and press motors to reduce friction noise - Maintain perimeter acoustic walls.	During Operational Phase	Proponent
6	Staff & Administrative Solid Waste	- Segregate office waste (paper/cardboard) from industrial process waste - Coordinate daily removal with Sundar Industrial Estate (SIE) management.	During Operational Phase	Proponent
7	Industrial & Sanitary Wastewater	- Treat all process effluent (oil/metal traces) in the on-site oil-water separator/ETP before estate discharge - Prohibit discharge of untreated greywater into storm drains.	During Operational Phase	Proponent
8	Occupational Health & Safety (Burns/Mechanical)	Provide specialized PPE (heat-resistant gloves, face shields) enforce "Permit to Work" (PTW) and Lock-Out Tag-Out (LOTO) for furnace maintenance.	During Operational Phase	Proponent

9 FIRE SAFETY PLAN

A fire safety plan is a structured and comprehensive document that details procedures, protocols, and strategies aimed at preventing, preparing for, and responding to fire emergencies at the M/s Nice Chain Co. (Pvt.) Ltd. project site. This essential plan outlines preventive measures, emergency procedures, evacuation protocols, fire detection and suppression systems, training requirements, and communication strategies. It assigns specific roles and responsibilities to individuals and provides clear instructions for evacuations, ensuring occupants or employees understand what to do in case of a fire. Regular reviews and updates to the plan maintain its relevance, ensuring compliance with fire safety regulations and fostering a safe and prepared environment in the event of a fire emergency.

9.1 Objectives of a Fire Safety Plan

The following objectives aim to create a safe and prepared environment for M/s Nice Chain Co. Private Limited, ensuring the protection of lives, property, and assets:

- **Fire Prevention:** The primary goal is to prevent fires by implementing measures that reduce hazards associated with high-heat manufacturing, furnaces, and lubrication oils, ensuring all safety systems and protocols are up to standard.
- **Occupant Safety:** Protecting the lives and well-being of employees by ensuring quick and safe evacuation through established and practiced efficient routes and procedures.
- **Asset Protection:** Minimizing damage to high-value industrial machinery, such as power presses and heat treatment units, by having effective fire detection and suppression systems in place.
- **Response Protocols:** Outlining procedures to respond effectively and efficiently in the event of a fire, including establishing clear roles and responsibilities for personnel.
- **Regulatory Compliance:** Ensuring adherence to local fire safety regulations and industrial standards.
- **Training and Drills:** Conducting regular training sessions and drills to educate employees about safety procedures, evacuation routes, and the use of fire equipment.
- **Continuous Improvement:** Regularly reviewing and updating the fire safety plan to incorporate changes in equipment or procedures, ensuring the plan remains current and effective.

9.2 Fire Safety Symbols

In the industrial chain manufacturing facility of M/s Nice Chain Co. Private Limited., hazard identification symbols play a crucial role in communicating potential dangers to employees, emergency responders, and the public. These symbols, which are standardized, convey various hazards associated with the storage and handling of materials such as quenching oils, alloy steel, and chemical lubricants. It is crucial for all personnel to be familiar with these symbols and their meanings to ensure a safe working environment.

Some common symbols and their meanings in this facility include:

- **Flammable Symbol:** Warns about the potential for fire or explosion, particularly near quenching oil tanks, lubricant storage, and furnace fuel lines.



Figure 9-1: Symbol for Flammable Material

- **Gas Cylinder Symbol:** Highlights the presence of compressed gas cylinders used in welding or furnace atmospheres, signifying the potential pressure and hazards associated with gas containment.



Figure 9-2: Symbol for Gas Cylinder

- **Toxic Symbol:** Warns about the toxicity of certain industrial chemicals or process gases, emphasizing the need for caution and proper handling to avoid health hazards.



Figure 9-3: Symbol for Toxic Material

- **Explosive Symbol:** Indicates the potential for an explosion due to certain conditions or high-pressure elements present in the manufacturing process.



Figure 9-4: Symbol for Explosive Material

- **Electrical Hazard Symbol:** Warns about electrical hazards present in the facility, such as high-voltage power presses and furnace control panels, highlighting the risk of electrical shock or short circuits.



Figure 9-5: Symbol for Electrical Hazard

- **PPE (Personal Protective Equipment) Symbol:** Emphasizes the necessity of wearing appropriate personal protective equipment such as heat-resistant gloves, safety goggles, and protective footwear while working in the facility.



Figure 9-6: Symbols of PPEs

- **Environmental Hazard Symbol:** Signifies potential hazards to the environment, such as contamination or pollution risks arising from leaks of lubricants or quenching fluids.



Figure 9-7: Environmental Hazard Symbol

These symbols are commonly used in combination with written warnings, color codes, and other safety measures to ensure a comprehensive and easily understandable identification system for the hazards present in the automotive and industrial chain manufacturing unit

9.3 Fire Safety Measures

Fire safety measures prevent fires and explosions, safeguard personnel, protect property and equipment, ensure compliance with regulations, maintain emergency preparedness, and mitigate environmental risks associated with potential fire incidents. Following safety measures are proposed at project site.

9.4 Fire Extinguishers

Fire extinguishers are essential in production, furnace, and storage areas of the facility. They provide a means to quickly suppress small fires, prevent their escalation, comply with safety regulations, and protect lives and the environment. These extinguishers ensure emergency preparedness and the rapid containment of fires, offering immediate response and safety for individuals working in or around high-heat zones and material storage areas.

9.4.1 Dry Chemical Powder Fire Extinguishers

Dry Chemical Powder (DCP) Fire Extinguishers: These are a critical safety measure in chain manufacturing facilities due to their ability to combat different classes of fires, including those involving lubricants, quenching oils, and electrical equipment. In manufacturing operations where flammable substances and sensitive machinery are present, DCP extinguishers are highly effective as they interrupt the chemical reaction of the fire, quickly suppress flames, and minimize the risk of escalation. They are particularly useful for Class B fires (flammable liquids) and Class C fires (electrical equipment), which are common risks in production and storage facilities.



Figure 9-8: DCP Fire Extinguisher

9.4.2 Fire Extinguishers Foam Type

These play a critical role in ensuring the safety of the facility. Manufacturing operations often involve the use of flammable liquids such as quenching oils and industrial chemicals, which pose significant fire hazards if not properly managed. Foam-type extinguishers create a blanket over the liquid surface, suppressing the release of flammable vapors and effectively preventing the spread of fire.



Figure 9-9: Fire Extinguisher Foam Type

9.4.3 Fire Hydrants

These provide immediate access to water for firefighting in emergencies, supporting fire suppression efforts, ensuring site safety by cooling structures, and complying with safety regulations.



Figure 9-10: Fire Hydrant

9.4.4 Fire Alarm

Crucial for early fire detection, timely warnings, evacuation facilitation, and prevention of fire escalation. A fire alarm system is to be installed specifically in the storage and production plant.



Figure 9-11: Fire Alarm

9.4.5 Sand Buckets

Sand In the event of a small fire or a minor leak that may lead to a fire, sand buckets provide a crucial first line of defense. Sand is a non-combustible material, and when swiftly applied to a small flame, it can smother the fire by cutting off its oxygen supply. These are strategically placed throughout the facility to contain and control potential fire hazards effectively.



Figure 9-12: Sand Bucket

9.4.6 Fire Pump

A critical component of the facility's firefighting system, ensuring a pressurized and reliable water supply during emergencies. It ensures that water is delivered at high pressure to firefighting hoses and nozzles, enabling responders to swiftly extinguish or control a fire.



Figure 9-13: Fire Pump

9.4.7 Jockey Pump

This pump ensures that the fire suppression system's main piping remains pressurized within an optimal range. It helps prevent unnecessary cycling of the main fire pump and ensures the system is ready to respond swiftly to emergencies.



Figure 9-14: Jockey Pump

9.4.8 Standby Pump

This is a critical component for ensuring the reliability and continuous functionality of the fire protection system. In the event that the primary fire pump faces mechanical failure, the standby pump serves as a backup, providing a constant and reliable water supply.

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10 OCCUPATIONAL HEALTH AND SAFETY PLAN

The Occupational Health and Safety (OHS) plan holds paramount importance within the framework of this EIA for M/S Nice Chain Co. (Pvt.) Ltd. This plan is a comprehensive document that outlines strategies and protocols to safeguard the well-being of workers involved in automotive and industrial chain manufacturing. Beyond the ethical imperative of ensuring a safe working environment, the OHS plan is integral to regulatory compliance and risk management at the Sundar Industrial Estate facility.

It identifies potential occupational hazards associated with chain manufacturing—such as high-temperature furnace operations, mechanical risks from power presses, and exposure to industrial lubricants establishes preventive measures, and details emergency response procedures. By incorporating an OHS plan into the EIA, not only is the health and safety of the workforce prioritized, but it also contributes to the overall success and sustainability of the project. A well-executed OHS plan minimizes the likelihood of accidents, injuries, and occupational health issues, fostering a workplace culture that values the welfare of its personnel. In essence, the OHS plan, as part of the EIA process, aligns with responsible and ethical project management, ensuring that occupational health and safety considerations are seamlessly integrated into the facility's design, implementation, and ongoing operations.

10.1 Objectives of Occupational Health and Safety

The objectives of the Health and Safety plan at M/s Nice Chain Co. (Pvt.) Ltd. are as follows:

- **Protect Workforce and Community:** Protect the health and safety of employees, contractors, visitors, and nearby communities by preventing workplace injuries, occupational illnesses, exposure to industrial lubricants, and fire hazards.
- **Minimize Process Risks:** Minimize risks associated with automotive and industrial chain manufacturing, including the handling of quenching oils, flammable solvents, and metal fines, ensuring safe storage, processing, and disposal practices.
- **Ensure Compliance:** Ensure compliance with all applicable health, safety, and environmental regulations, as well as international industrial standards relevant to metalworking operations.
- **Promote Safety Culture:** Promote a safe working culture by providing comprehensive training, appropriate Personal Protective Equipment (PPE), and emergency preparedness measures for fires, lubricant spills, or accidental releases.
- **Safeguard the Environment:** Safeguard the local environment by preventing contamination of air, water, and soil from industrial waste, furnace emissions, and hazardous materials.
- **Continuous Improvement:** Support continuous improvement in health and safety performance through regular monitoring, internal audits, and proactive corrective actions.

10.2 Scope of Occupational Health and Safety Plan

The Occupational Health and Safety (OHS) framework at M/s Nice Chain Co. Private Limited. will cover the following areas:

- **Workplace Safety** – Implementation of safe work practices to prevent accidents, injuries, and occupational illnesses across production zones, furnace areas, warehouses, and administrative blocks.

- **Chemical & Material Safety** – Safe handling, storage, labeling, and disposal of industrial lubricants, quenching oils, degreasers, and other hazardous substances used in metal processing.
- **Mechanical & Furnace Safety** – Control measures for high-temperature furnace operations, power presses, and automated machinery to protect employees from thermal burns, mechanical entanglement, or crushing hazards.
- **Fire and Explosion Safety** – Installation and maintenance of firefighting equipment, alarms, and emergency response systems to address risks from flammable quenching oils and high-heat industrial processes.
- **Personal Protective Equipment (PPE)** – Provision, use, and monitoring of specialized PPE such as heat-resistant gloves, safety goggles, steel-toed boots, and protective aprons to reduce occupational exposure risks.
- **Health Surveillance & Medical Services** – Regular health check-ups, occupational health screenings, and first-aid facilities for all plant employees.
- **Training and Awareness** – Continuous education and training programs for employees and contractors on safe metalworking practices, emergency response, and hazard identification.
- **Emergency Preparedness & Response** – Development of evacuation plans, spill management procedures for oils/lubricants, and regular fire drills to ensure rapid and effective responses to emergencies.
- **Regulatory Compliance** – Strict adherence to provincial and national occupational health and safety standards applicable to the automotive and industrial manufacturing sector.
- **Continuous Improvement** – Regular monitoring, auditing, and reviewing of OHS performance for the ongoing enhancement of workplace safety and operational integrity.

10.3 Personal Protective Equipment

The use of Personal Protective Equipment (PPE) at M/s Nice Chain Co. Private Limited. is vital for safeguarding workers, ensuring regulatory compliance, mitigating risks, and promoting a culture of safety that is conducive to both employee well-being and operational excellence. The importance of PPE in this industrial chain manufacturing setting cannot be overstated.

Here are the key reasons highlighting the significance of PPE in this industrial facility:

- **Primary Defense:** PPE provides a crucial line of defense against various occupational hazards prevalent in a metalworking and chain manufacturing environment. It includes items such as safety helmets, heat-resistant gloves, safety goggles, and respiratory protection, which shield workers from potential injuries, lubricant exposures, and airborne metallic particles.
- **Regulatory Compliance:** Utilizing PPE is a legal requirement and is mandated by occupational health and safety regulations. Adhering to these regulations not only ensures the safety of workers but also prevents regulatory penalties and legal issues for the manufacturing unit.
- **Risk Mitigation:** Chain manufacturing involves heavy machinery, high-temperature furnaces, and chemical processes that pose inherent risks. PPE serves as a risk mitigation strategy by minimizing the likelihood and severity of injuries or illnesses, contributing to a safer working environment.

- **Chemical & Thermal Protection:** In the chain manufacturing process, workers may come into contact with various industrial lubricants, quenching oils, and degreasers used in production and finishing stages. PPE, such as chemical-resistant gloves and protective clothing, safeguards workers from direct skin contact and potential harm.
- **Respiratory Health:** Metal dust and other airborne particles are common in manufacturing plants during grinding and finishing. Respiratory protection, such as masks or respirators, is vital in preventing inhalation of harmful substances, promoting respiratory health, and minimizing the risk of respiratory-related illnesses.
- **Worker Comfort & Productivity:** PPE not only prioritizes safety but also contributes to the overall comfort of workers. Comfortable and well-fitted PPE encourages adherence to safety protocols, fostering a positive work culture and enhancing overall productivity.
- **Emergency Protection:** In the event of unexpected incidents or emergencies, PPE can be crucial for protecting workers and mitigating the impact of accidents. Items like hard hats and steel-toed boots provide added protection during emergency scenarios.
- **Employer Commitment:** Providing PPE demonstrates the employer's commitment to the health and safety of its workforce, instilling confidence and trust among employees. This, in turn, contributes to a positive work environment and higher employee morale.

10.4 PPE Required For Construction Phase

During the construction of the M/s Nice Chain Co. Private Limited. facility, a comprehensive set of Personal Protective Equipment (PPE) is necessary to safeguard the health and safety of workers involved in civil works, machinery installation, and structural assembly. The following PPE is required to manage the specific hazards associated with this construction phase:

- **Head Protection:** Hard hats to protect against falling objects, impact, or head injuries during structural steel work and overhead construction.
- **Eye and Face Protection:** Safety glasses or goggles to shield the eyes from concrete dust, metal shavings, and debris. Face shields for additional protection during welding or grinding tasks.
- **Hearing Protection:** Earplugs or earmuffs to reduce exposure to high noise levels from piling rigs, concrete mixers, and heavy machinery.
- **Respiratory Protection:** Dust masks or respirators to protect against inhalation of silica dust, cement particulates, or fumes from welding activities.
- **Hand Protection:** Safety gloves appropriate for specific tasks, such as cut-resistant gloves for handling metal materials, leather gloves for general labor, or chemical-resistant gloves for concrete admixtures.
- **Body Protection:** High-visibility vests or clothing to enhance visibility near moving construction vehicles. Protective coveralls for tasks involving exposure to lubricants, dust, or hazardous construction materials.
- **Foot Protection:** Steel-toed safety boots to protect against crushing injuries, falling tools, or punctures from sharp construction debris.
- **Fall Protection:** Safety harnesses, lanyards, and anchor systems for workers operating at heights during roof installation or high-elevation electrical/piping work.

- **Joint Protection:** Elbow and knee pads for specialized construction tasks involving prolonged kneeling or crawling during foundation and floor work.
- **Weather Protection:** Weather-appropriate gear, including rain protection, high-temperature appropriate clothing, or sunscreen, depending on the climatic conditions in Lahore during construction.
- **First Aid Kit:** On-site access to a fully equipped, well-maintained first aid kit to provide immediate care for minor injuries or emergencies.

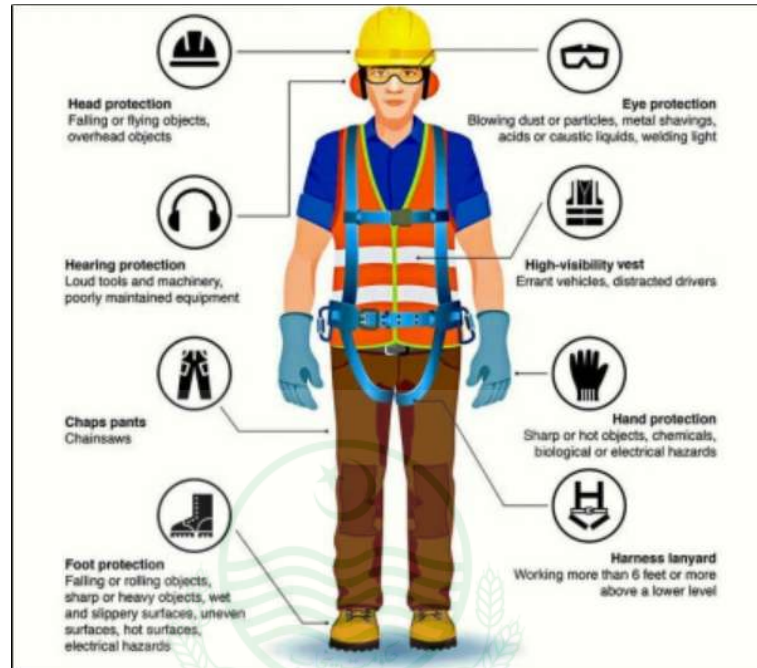


Figure 10-1: PPEs for Construction Phase

It is essential for the construction project management to conduct a thorough hazard assessment to identify the specific risks associated with each construction activity and determine the appropriate PPE for the workers involved. Regular training, monitoring, and enforcement of PPE usage contribute to a safer construction environment.

10.5 Safety Signs during Construction Phase

Safety signs serve as critical elements in maintaining a secure and hazard-free environment at construction sites. Their importance lies in their ability to effectively communicate potential risks and hazards to workers, visitors, and contractors. By providing clear information about safety procedures, required personal protective equipment, and safe work practices, these signs play a pivotal role in preventing accidents and injuries. Moreover, safety signs contribute to regulatory compliance, ensuring adherence to local regulations and occupational health and safety standards. They also serve as essential tools for emergency response by indicating the location of emergency exits, first aid stations, fire extinguishers, and other emergency equipment. In addition to their role in risk reduction, safety signs assist in site navigation, guiding individuals to specific areas and enhancing overall organization. Beyond practical benefits, safety signs contribute to fostering a culture of safety awareness among the workforce. They communicate important safety policies, promote compliance with site-specific regulations, and reduce the project's liability by showcasing a commitment to responsible construction practices. Ultimately, safety

signs are integral components in creating a safe, compliant, and organized construction site conducive to the well-being of all involved parties.



Figure 10-2: Safety signs for Constructional Phase

10.6 Personal Protective Equipment during Operational Phase

Personal Protective Equipment (PPE) is an essential component of the health and safety system at M/S Nice Chain Co. (Pvt.) Ltd. It is designed to safeguard employees from industrial hazards that may arise during metal processing, heat treatment, and storage operations. PPE provides protection against:

- **Chemical Hazards** – Exposure to industrial lubricants, quenching oils, and degreasing agents that may cause skin irritation or chemical burns.
- **Metal Dust and Particulate Exposure** – Protection from inhalation of metal fines, grinding dust, and airborne particles created during the chain manufacturing and finishing stages.
- **Thermal and Mechanical Hazards** – Prevention of burns, cuts, or crushing injuries from high-temperature furnaces, power presses, and moving machinery on the production lines.
- **General Workplace Hazards** – Minimization of risks from slips, trips, falls, and accidental oil spills within the production floor and warehouse areas.

10.7 PPE Required for M/S Nice Chain Co. (Pvt.) Ltd.

The use of appropriate PPE is mandatory in industrial operations to ensure a safe working environment. The following PPE is required for workers at the facility:

- **Protective Coveralls / Aprons** – To protect against oil splashes, metal debris, and general contamination.
- **Gloves (Nitrile / Cut-Resistant / Heat-Resistant)** – For handling sharp metal components, hot industrial parts, and chemical lubricants.

- **Safety Goggles / Face Shields** – To protect eyes from flying metal shavings, sparks during welding/grinding, and chemical splashes.
- **Respiratory Protection (Masks / Respirators)** – For safeguarding against metal dust, oil mists, and airborne contaminants.
- **Safety Shoes / Steel-Toed Boots** – To prevent injuries from slips, trips, and falling heavy metal components.
- **Hearing Protection (Ear Plugs / Muffs)** – Required in areas where noise levels from presses and furnaces exceed occupational safety limits.
- **Head Protection (Hard Hats)** – For specific operations involving overhead cranes or materials handling near production lines.

Regular training, inspection, and replacement of PPE will be ensured to maintain safety standards and regulatory compliance.



Figure 10-3: PPE required for the operational phase of M/s Nice Chain Co. Private Limited

11 TREE PLANTATION PLAN

To act as a physical barrier for noise, odor, and dust suppression, an extensive tree plantation program will be implemented along the boundary of the M/S Nice Chain Co. Private Limited facility.

D. Planning and Strategy

- **Site Selection:** Strategic areas along the boundary walls and internal access roads.
- **Site Preparation:** Removal of construction debris, soil leveling, and enrichment with organic compost to support healthy growth.
- **Greenbelt Design:** A single row of approximately 1,000 trees will be planted along the boundary line with a spacing of 5 ft (1.5 m) between each tree.
- **Selection Criteria:** Species have been chosen based on their fast-growing nature, dense foliage canopy to trap particulate matter, and tolerance to industrial environments. Preference is given to evergreen and tall-growing species for the outer perimeter to maximize the barrier effect.

11.1 Recommended Tree Species

The following species are selected for their suitability in the local climate of Lahore:

Common Name	Botanical Name	Height	Type	Picture
Khair	<i>Acacia Catechu</i>	10-12m	Evergreen	
Phulai	<i>Acacia Modesta</i>	Medium	Deciduous	
Kachnar	<i>Bauhinia Veriagata</i>	8-12m	Evergreen	
Kaghzi Tut	<i>Broussonetia Papyrifera</i>	18-25m	Deciduous	
Putranjan	<i>Putranjiva Roxburghii</i>	18m	Evergreen	

E. Lawn Planting and Landscape Protection

- **Lawn Establishment:** Lawn grass will be planted using industry-standard techniques. Planting will be avoided during extreme heat (above 90° F) or when the ground is muddy.

- **Protection:** All landscaped areas will be protected from trespassing and damage via temporary fencing and signage. Any damaged plants will be promptly treated or replaced during the maintenance period to ensure the integrity of the greenbelt.

F. GREEN BELT DESIGN

Extensive tree plantation will be carried out to act barrier to control escape of odor, if any, in the surrounding areas. As a part of tree plantation plan, plants which are moderately tolerant to the pollutants but are endowed with fast growing, dense foliage canopy will be planted. The number of plants to be grown along the boundary line of the area will be estimated after physical survey of the during construction and will be approximately 1000 in single row with a tree to tree distance of 5ft/1.5m. The trees planted here will have dense spreading canopy. The trees will also be grown along the roads and the open stretches. This area will not only act as to reduce the pollution but also will increase the aesthetics of the area. So the trees grown in this area must be flowering as well ornamental plants. All along the boundary of the treatment plant, a strip of plantation with trees which are tall in nature and evergreen in habit. This area will act as a barrier and as far as possible check the pollutants from their escape and potential contamination of other components of local environment.

- **Lawn Planting**

No lawn shall be planted when temperatures are above 90° F or if the ground is in a muddy condition/ or other conditions that are unsuitable in the area. The sweet soil surface shall be moistened with a fine spray immediately before planting. The lawn shall be planted according to acceptable standards practice in order to ensure a completely healthy grass cover. The planting procedures shall be approved by designated person at site.

- **General Landscape Protection**

Planting areas and plants shall be protected all times against trespassing and damage of all kinds for the duration of maintenance period. If any plant/s become damage or injured, they shall be treated or replaced. Protection shall also include all temporary protections fences and barriers, all signs and all other work incidental to proper maintenance.

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12 STAKEHOLDER CONSULTATION

Stakeholder consultation is of paramount importance in the EIA process for the M/s Nice Chain Co. Private Limited. facility at the Sundar Industrial Estate, as it facilitates inclusive decision-making, fosters transparency, and enhances the overall quality of the environmental assessment. Involving stakeholders including the management of the Sundar Industrial Estate (SIE), neighboring industrial units, regulatory bodies like the Punjab EPA, and local labor groups ensures that diverse perspectives, concerns, and specialized industrial knowledge are taken into account. This inclusive approach contributes to the identification of potential environmental and social impacts, such as localized traffic bottlenecks during machinery mobilization or specific drainage requirements for industrial effluent that might not be evident from a solely technical or regulatory standpoint.

Stakeholder consultation is a primary method for involving both primary and secondary stakeholders in making decisions about the facility's layout and the development of the industrial site. Stakeholder engagement builds trust between the project proponents and the existing industrial community, allows for the exchange of valuable information regarding collective utility usage and waste management infrastructure, and empowers the local workforce by giving them a voice in the decision-making process.

Moreover, it helps to align the establishment of the chain manufacturing plant with the needs and expectations of the industrial estate, minimizing conflicts over utility connections and fostering a sense of shared responsibility for the region's environmental stewardship. In essence, stakeholder consultation transforms the EIA into a more robust and credible tool, enhancing the sustainability and social acceptance of the manufacturing facility within this premier industrial zone.

12.1 Objectives of Stakeholder Consultation

In 1992, In 1992, the United Nations Conference on the Environment and Development (UNCED) supported the idea of involving the public in decision-making, and this was outlined in one of the key documents of the conference called Agenda 21.

Agenda 21 is a comprehensive plan for global actions focused on sustainable development and deals with how people interact with the environment. It highlights the importance of including the public in making decisions about the environment to achieve sustainable development.

The objectives of stakeholder consultation in the context of EIA are multi-faceted, aiming to foster meaningful engagement, inclusivity, and informed decision-making. Some key objectives include:

- Ensure the inclusion of diverse stakeholder perspectives in the decision-making process, promoting a more comprehensive understanding of potential environmental and social impacts.
- Provide a platform for stakeholders to express their concerns, values, and local knowledge related to the project, contributing to a more nuanced understanding of potential impacts and benefits.
- Gather valuable insights and feedback that can be integrated into the project design, helping to address and mitigate potential adverse impacts and enhance positive contributions.

- Establish trust among stakeholders by being transparent, responsive, and open to dialogue. Building trust is essential for the successful implementation of the project and its long-term acceptance by the community.
- Fulfill regulatory requirements by actively engaging with stakeholders, demonstrating a commitment to compliance with environmental and social standards, and addressing concerns raised during the consultation process.
- Facilitate an open and inclusive dialogue to build understanding and acceptance of the project within the affected communities, minimizing potential conflicts and fostering a sense of shared responsibility.
- Integrate local knowledge and community input to enhance the overall sustainability of the project, aligning it with the needs and aspirations of the affected stakeholders.
- Disseminate accurate and accessible information about the project, its potential impacts, and proposed mitigation measures to ensure that stakeholders are well-informed and can actively participate in the decision-making process.
- Consider the needs and interests of all affected parties, including vulnerable or marginalized groups, to ensure that the benefits and burdens of the project are distributed equitably.
- Create a platform for addressing conflicts and disputes, allowing for the resolution of issues through open communication and negotiation.

Stakeholder Management



Figure 12-1: Stakeholder Management

By achieving these objectives, stakeholder consultation contributes to the overall success and sustainability of the project, enhancing its social, environmental, and economic outcomes while fostering positive relationships with the communities it impacts.

The proponent and management, demonstrating a proactive commitment to responsible practices, assured the incorporation of all suggested mitigation measures, from installing the advanced Air Pollution Control System for the furnace and grinding operations to implementing strict dust suppression and safety protocols. Their pledge to embrace these measures underscores a dedication to environmental stewardship and sustainable industrial development.

By actively engaging in this discourse, the proponent and management not only exhibit a commitment to regulatory compliance with Punjab EPA standards but also demonstrate a broader responsibility to the well-being of the Sundar Industrial Estate

community and the preservation of the surrounding industrial landscape. This collaborative approach ensures that the installation of the chain manufacturing infrastructure aligns with best practices, fostering a positive impact on the production of industrial components while minimizing any potential adverse effects on the surrounding environment.

12.2 Proponent Environment Management Team

Environment Management Team of M/s Nice Chain Co. Private Limited. includes the following members for smooth operation of Effluent treatment plant

- Project Manager
- HSE Officer
- Process Plant Engineer
- Waste Management Team
- Electrical Technician

The above all members will be hired after the completion of construction activities.

12.3 The Responsible Authority

The Proponent assumes the crucial role of the responsible authority, pledging to undertake all necessary measures both prior to the commencement of the project and throughout its operational phases. This commitment encompasses a comprehensive approach to project management, ensuring that all regulatory requirements, environmental standards, and best practices are diligently adhered to. Before project initiation, the Proponent commits to conducting thorough assessments and implementing necessary preparatory measures to mitigate potential impacts. This includes adopting robust environmental management strategies, obtaining required permits, and addressing any concerns raised during stakeholder consultations. Throughout the operational phase, the Proponent maintains an ongoing commitment to environmental sustainability and regulatory compliance. This involves continuous monitoring, prompt response to emerging issues, and the implementation of adaptive management practices. By assuming the mantle of responsibility, the Proponent not only safeguards the project's integrity but also prioritizes the well-being of the environment, local communities, and all stakeholders involved. This proactive stance ensures that the project operates within the parameters of environmental and ethical standards, reflecting a dedication to responsible and sustainable project execution.

Table 12-1: Stakeholders and their Roles and Responsibilities

Stakeholders	Roles
Proponent / Responsible Authority (M/S Nice Chain Co. Private Limited.)	The discussion with the proponent focused on the adoption of proposed mitigation measures and technical alternatives such as the selection of high-efficiency manufacturing lines and the design of the air pollution control system to control any environmental or social disparity during the project lifecycle.
Environmental Expert (Consultant Team)	The consultants surveyed the project site and the surrounding industrial landscape of Sundar Industrial Estate to gather primary environmental data. They recorded the industrial community's stance and evaluated

Stakeholders	Roles
	the socio-economic impacts specifically related to metal processing and furnace operations.
Government Departments	Consulted departments include the Environmental Protection Agency (EPA) Punjab and the Sundar Industrial Estate (SIE) Management. These departments reviewed the proposed facility for its alignment with provincial environmental standards (PEQS) and its long-term health and economic benefits for the Lahore region.
Local Affected Communities (Industrial Units & Labor)	Social surveys and consultations were conducted with the management of neighboring industrial units and the local labor force. These surveys determined the extent to which the surrounding industrial environment might be affected by the installation of specialized manufacturing equipment and recorded their verdict to ensure the project maintains its social license to operate within the estate.

12.4 Other Departments and Agencies

A comprehensive impact analysis was conducted in collaboration with key stakeholders, including the project management of M/S Nice Chain Co. Private Limited., neighboring industrial units within the Sundar Industrial Estate (SIE), and technical staff from nearby industrial facilities. This inclusive approach sought to gather diverse perspectives and insights related to the implementation of the chain manufacturing plant at the project site. The engagement process involved scoping sessions, focused group discussions, and wayside consultations within the industrial zone, providing a multifaceted platform for dialogue and information exchange. Through these forums, all pertinent issues associated with the project were thoroughly examined, including potential environmental impacts such as noise levels from furnaces, power presses, and high-capacity machinery, as well as social concerns regarding waste management and effluent discharge. The proactive involvement of stakeholders, representing various sectors of the industrial community, ensured that a holistic understanding of the project's implications was achieved. This collaborative effort not only fostered transparency but also allowed for the incorporation of valuable local knowledge—such as existing utility load capacities and regional drainage patterns—into the impact analysis. By actively engaging with stakeholders through diverse communication channels, the project management demonstrated a commitment to responsible and inclusive decision-making, setting the stage for a well-informed and socially accepted project implementation process.

12.5 Environmental Practitioners and Experts

The project management and environmental consultants maintain a steadfast commitment to proactive stakeholder engagement, recognizing that the long-term success of the M/S Nice Chain Co. Private Limited. facility depends on the trust and support of the Sundar Industrial Estate, Lahore community and the neighboring industrial units. By facilitating transparent dialogues that bridge the gap between technical manufacturing requirements and local environmental expectations, the project ensures that the installation of high-capacity chain production lines and the development of the site proceed with high social and industrial acceptance. This collaborative approach not only fulfills regulatory mandates for the Environmental Impact Assessment but also creates a shared sense of ownership, where the

manufacturing of industrial chain products is seen as a collective milestone for regional economic development and environmental stewardship.

12.6 Discussed Points

The points that have been kept in view while consulting stakeholders are as follows:

- Activities of the project and their consequences.
- Requirements of the people likely to be affected.
- Mitigation measures or compensation strategies.
- Role of the affected people in the implementation and development of the project.

12.7 Affected and Wider Community

In the vicinity of the proposed project, there is no identified affected community; however, the proactive engagement of the proponent with stakeholders from various sectors has been instrumental in understanding and addressing local perspectives. In the vicinity of the proposed M/S Nice Chain Co. Private Limited. facility, there is no identified affected community directly within the project site; however, the proactive engagement of the proponent with the management and workforce of the Sundar Industrial Estate (SIE) has been instrumental in understanding and addressing local industrial perspectives. Although the manufacturing plant is strategically located within the industrial zone, the absence of a distinct displaced community does not diminish the importance of comprehensive consultations. The proponent has undertaken conscientious efforts to reach out to neighboring industrial units and administrative bodies, fostering a dialogue to assess the community's sentiments towards the installation of high-capacity production lines and pollution control systems. Remarkably, the feedback from these consultations has been overwhelmingly positive, with stakeholders expressing favorable views regarding the project's potential to enhance the region's manufacturing capacity. This positive reception is indicative of the proactive communication and collaborative approach adopted by the proponent, establishing a foundation of mutual understanding and support within the broader industrial community. While the project maintains a safe operational buffer—with the facility being situated at a distance designed to comply with official Punjab-EPA safety and environmental clearances—the commitment to inclusive consultations with diverse stakeholders remains integral to building a harmonious relationship with the local industrial population.





Figure 12-2: Pictorial Overview of Stake Holder Consultation



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13 CONCLUSION AND RECOMMENDATIONS

Based on the study conducted for the Environmental Impact Assessment (EIA) of the M/s Nice Chain Co. Private Limited. facility at the Sundar Industrial Estate, Lahore, the following recommendations are made:

- **Compensatory Plantation:** Extensive plantation of native and ornamental species shall be carried out within the project plot to enhance the aesthetic value of the facility and contribute to the green cover of the Sundar Industrial Estate.
- **Sustainable Infrastructure:** A sustainable development approach must be maintained through the efficient use of resources, specifically by optimizing the performance of the air pollution control system and minimizing energy consumption across the production lines.
- **EMP Implementation:** All environmental aspects of the project, specifically the management of industrial solid waste and the containment of furnace emissions, must be strictly managed through the rigorous implementation of the Environmental Management Plan (EMP).
- **Green Motto:** Project management should adopt a "Safe, Clean, and Sustainable Manufacturing" motto to ensure the production of industrial components remains environmentally friendly and socially responsible.

On the basis of the findings of this EIA, it is concluded that the proposed chain manufacturing facility and its associated technical infrastructure will not pose any significant adverse impact on the local industrial population or the environment, provided the identified mitigation measures are followed. Therefore, it is recommended that the competent authority (Punjab EPA) issue the Environmental Approval for the construction and operation of this project.

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ANNEXURE – A: EREFERENCES

1. Listed below are some of the documents, reports and other references consulted during the preparation of this report:
2. Information and data provided by project proponents;
3. Project Pre-feasibility Study Report;
4. Technical Design Data related to the project.
5. Information gathered through discussions with the project related persons of the project proponent;
6. Information collected from the Technical documents of various suppliers of machinery/equipment.
7. National Environment Quality Standards for Ambient Air November 2010; Punjab Environment Quality Standards Noise Levels November 2010;
8. Punjab Environment Quality Standards for Drinking Water November 2010;;
9. Pakistan Environmental
10. Protection Act, 1997;
11. The Punjab Environmental Protection (Amendment) Act 2011 covers aspects related to:
12. The protection, conservation, rehabilitation and improvement of the environment and the prevention, control of pollution and promotion of sustainable development;
13. Establishing complete regulatory and monitoring bodies, policies, rules, regulations and national environmental quality standards; and
14. To ensure enforcement, the act establishes regulating bodies i.e. Punjab Environmental Protection Council (PEPC) and responsible bodies i.e. Punjab Environmental Protection Agency (Punjab EPA) at Provincial level.
15. Environment related Laws in Pakistan and the Province of Punjab;
16. Government of Pakistan, Pakistan Environmental Protection Agency, Policy and Procedures for Filing, Review and Approval of Environmental Assessment, 2022;
17. Google earth, maps.
18. Guidelines for Public Consultations - These guidelines cover:
19. Consultation, involvement and participation of Stakeholders
20. Techniques for public consultation (principles, levels of involvements, tools, building trust)
21. Effective public consultation (planning, stages of EIA where consultation is appropriate)
22. Consensus building and dispute resolution.
23. Workplace safety and health act 2011
24. Land Acquisition Act (LAA) of 1894
25. The forest Act 1927
26. Pakistan Penal Code, 1860
27. Provincial Wildlife Act, 1974

ANNEXURE – B: TERM OF REFERENCES

- The Consultant is required to carry out an Environment Assessment Study of the Project as required under section 12 of Pakistan Environmental Protection Act 1997/ Punjab Environmental Protection Act 2012.
- The Study should be comprehensive and should cover all aspects which are envisaged under the relevant national and provincials laws & regulations including but not limited to
- Identification and recommendation for suitable solution/treatment/mitigation measures of emissions and effluents such as waste water and sludge etc in accordance with Punjab Environmental Quality Standards (PEQS).
- Identification and recommendation for suitable solution/treatment/mitigation measures of solvents, oils (tar), hazardous waste, organic compounds, steam, flue gases, particulate matter and chemical compounds harmful for the environment and other substances leading to air, noise, water and soil pollution in accordance with PEQS.
- The Study should be acceptable to the relevant national and/or provincial authorities (relevant authorities) in Punjab.



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ANNEXURE – C: LIST OF ACRONYMS

EA	Environmental Approval
EIA	Environmental Impact Assessment
EMtP	Environment Mitigation and Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
Ft	Feet
GoP	Government of Pakistan
HSE	Health Safety Equipment
IEE	Initial Environmental Examination
LMS	Light Melting Scrap
M&E	Monitoring and Evaluation
MT	Metric Tons
MSW	Municipal Solid Wastes
MW	Mega Watt
PEQS	Punjab Environment Quality Standards
NGOs	Non–Government Organizations
NOC	No Objection Certificate
OHS	Occupational Health and Safety
Pak–EPA	Pakistan Environment Protection Agency
PKR	Pak Rupees
PM	Project Manager
PPC	Pakistan Penal Code
PPE	Personal Protective Equipment
QA	Quality Assurance
SHE	Safety Health & Environment
VOC	Volatile Organic Compounds

ANNEXURE – D: PERSONS PERFORMING THE EIA STUDY (TEAM MEMBERS)

The proponent M/S Nice Chain Co. (Pvt.) Ltd. has assigned the task of preparing EIA report to M/S Integrated Environment Consultants. The EIA study of the proposed project has been conducted according to Environmental Assessment Procedures-1997, Review of IEE and EIA Regulation-2022 as prescribed by the Federal Environmental Protection Agency (Pak-EPA), Government of Pakistan. Study team of M/S Integrated Environment Consultants which completed the EIA report consists of following experts.

Name	Qualification	Status in Project
Mr. Ahtasham Raza	M.Phil (Env. Science)	Project In-charge
Mr. Adnan Sharif	M.Phil (Env. Sciences), DEL (Env. Law)	Team Leader
Mr. Mehmood Amjad	BS (Env. Science)	Monitoring In-charge
Mr. Muhammad Zain	BS (Env. Sciences)	Environmentalist

*Only the main roles of the team members are given. However, their role was not restricted to these, rather it also includes many other studies in their respective fields in the context of this EIA studies.



CHECKLIST (EIA)

PAK EPA GUIDELINES FOR PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS,
1997

Required Content	EIA Report		
	PAGE NO.	REMARKS (If Any)	LACKING
Executive summary:	B		
1. Title and location of project			
2. Name of the proponent	D		
3. Name of the organization preparing the report	D		
4. A brief outline of the proposal (type, process, technology and land requirement)	D		
5. The major impacts	E		
6. Recommendations for mitigation measures	E		
7. Proposed monitoring	G		
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4. Brief description of nature, size, and location of project	5		
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7. Schedule of implementation	23		
8. Description of the project (Process flow chart/steps, Technology, Raw material and products, by-products)	24		
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