IRRIGATION DEPARTMENT
GOVERNMENT OF BALOCHISTAN

PROJECT DESIGN, CONSTRUCTION SUPERVISION AND IMPLEMENTATION SUPPORT FOR BALOCHISTAN WATER RESOURCES DEVELOPMENT SECTOR PROJECT
(LOAN 3700-PAK)


INITIAL ENVIRONMENTAL EXAMINATION REPORT
WATER RESOURCES BUILDING, QUETTA

June 2021

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LIST OF ABBREVIATION

ADB	Asian Development Bank
AJK	Azad Jammu Kashmir
BEPA	Balochistan Environmental Protection Agency
BHUs	Basic Health Units
BWRDP	Balochistan Water Resources Development Project
BOQ	Bill of Quantities
CAD	Command Area Development
CCR	Community Complaint Register
CC	Construction Contractor
DO	Dissolved Oxygen
EA	Executing Agency
EHS	Environment Health & Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPC	Environmental Protection Council
FOs	Farmer Organizations
GIS	Geographic Information System
GoB	Government of Balochistan
GRC	Grievance Redress Committee
GRM	Grievance Redressal Mechanism
H_2S	Hydrogen Sulphide
IEE	Initial Environmental Examination
EHS	Environment, Health and Safety
IWRM	Integrated Water Resources Management
M&E	Monitoring and Evaluation
MCM	Million Cubic Meter
NCS	National Conservation Strategy
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
NOx	Oxides of Nitrogen
NTU	Nephelometric Turbidity Unit
PEPA	Pakistan Environmental Protection Act
PEPO	Pakistan Environmental Protection Ordinance
PHE	Public Health Engineering Department
PIS	Perennial Irrigation Schemes
PMD	Pakistan Meteorological Department
PPC	Pakistan Penal Code
PPEs	Personal Protection Equipment
PPTA	Project Preparatory Technical Assistance

PIU	Project Implementation Unit
BID	Balochistan Irrigation Department
REA	Rapid Environmental Assessment
RHCs	Rural Health Centers
SOx	Oxides of Sulfur
SPS	Safeguard Policies
SC	Supervision Consultants
TA	Technical Assistance
TCI	Techno Consult International
TDS	Total dissolved solids
TSS	Total Suspended Solids
UNEP	United Nation Environment Program
VOCs	Volatile Organic Compounds
WHO	World Health Organization
WUA	Water User Association

EXECUTIVE SUMMARY

A. INTRODUCTION

This report presents the findings of an Initial Environmental Examination (IEE) study for proposed water resources building, Quetta. The Project is being funded by Asian Development Bank (ADB) with Balochistan Irrigation Department (BID) acting as the Executive Agency (EA).

The proposed civil work is located on an existing building compound of Irrigation department, Balochistan which is on government-owned land. There is no protected area, environmental sensitive areas, wetlands, mangroves, estuaries, cultural heritage site or historical monuments in or near the Project's location.

Based on the ADB's Rapid Environment Assessment Checklist and Safeguards Policy Statement 2009, the environmental categorization of the project is category B, requiring the preparation of initial environment examination (IEE).

The anticipated impacts on the physical and biological environment are temporary, localized, can be easily avoided or minimized with the implementation of mitigation and monitoring measures which are detailed in the environmental mitigation plan (EMP) and environmental monitoring plan (EMoP), respectively. The following are the anticipated impacts and the corresponding mitigation measures during the construction phase of the Project:

(i) Air pollution from the dust emissions from demolishing of existing building of irrigation department, movement of earth materials and emission from movement of heavy equipment and construction vehicles which will be mitigated by good construction practices such as water spraying on road surface and work areas, covering all salvageable materials during transportation, proper maintenance of construction vehicles and equipment, and washing truck-tires particularly trucks carrying soil from the construction areas;

(ii) Water pollution from run-off or soil erosion from stockpiled construction materials and wastewater from domestic sewage of construction workers and accidental spillage of oil and other lubricants from washing of construction equipment, which will be mitigated by covering exposed soils, construction of temporary silt traps, and provision of adequate and on-site sanitation facilities;

(iii) Noise pollution from the construction activities resulting to disturbance and nuisance to the nearby buildings and community, which will be mitigated with continuous consultation with the officials of Irrigation department and the community on the schedule and time of construction activities and the use of noise suppression on construction equipment;

(iv) The generation of demolition debris have to require bidding contractor/bidder to be accountable for dumping the demolition debris at her/his designated landfill/site and committing to re-use or sold out the salvageable materials of the existing building such as cement tiled roofs, doors, windows, aluminum frames, glasses, existing furniture's, air conditioners, bricks, irons and so forth, therefore, it could be reduced the volumes of demolition debris. The solid wastes from existing building should be collected, temporary stored and disposing properly by hiring services of reputed contractor, and the solid waste from the construction of proposed water resources building will be mitigated by the

provision of waste bins in the construction site and the proper segregation, temporary storage, collection and disposal of solid wastes will be strictly observed.

(v) Occupational health and safety in the construction site causing harm and danger to the lives and welfare of workers, which will be mitigated with the implementation of occupational and health safety plan including the provision of personal protective equipment to all workers; in addition, COVID-19 risk management and prevention is taking into account especially for workers and staff at construction sites/civil works implementations.

(vi) Community health and safety such as the disruption of normal traffic patterns, traffic accident, damage or degradation of Capital City roads from the transport of materials and risks from unauthorized entry to the construction resulting to accidents. This will be mitigated by the implementation of community health and safety plan which will include recruitment of duly licensed drivers, the provision of fence to enclose the Irrigation department building and posting warning signs and information in the irrigation department building.

During the operation of the water resources building, PMO will ensure the implementation of proper segregation, temporary storage, collection and disposal of solid waste, provision of adequate drinking water supply and sanitation facilities, implementation of occupational health and safety to all trainees and staff, and emergency response plan during fire, earthquake and other incidents.

Public consultations involving the stakeholders of the project has been conducted through consultation meetings and key informant interviews. The concerns and recommendations of the stakeholders were incorporated in the EMP. A grievance redress mechanism (GRM) is also established to address and facilitate complaints in a timely and transparent manner during the construction phase of the project. Results of the initial environment examination indicated that proposed water resources building will not result to significant adverse environmental impacts. The anticipated impacts during the construction phase of the project can be easily mitigated with the implementation of EMP and EMoP.

CHAPTER - 1
INTRODUCTION

1. INTRODUCTION

1.1 GENERAL

Balochistan is the largest province of Pakistan in terms of area and smallest in terms of population. It is reckoned to be comparatively less developed and the sole reason is scarcity and paucity of water. Water is a critical resource for sustainable economic development of Balochistan. The Government of Balochistan (GoB) formulated Integrated Water Resources Management Policy to improve efficiency of surface and ground water and the Project supports in implementation of the Policy. The Policy provides a comprehensive framework for the province to address the issues of water management and development in the context of basin approach, with water harvesting, and groundwater recharging as an integral part of watershed management.

Balochistan Water Resources Development Sector Project (BWRDSP) is financed by Asian Development Bank (ADB) loan (3700-PAK). The project will support implementation of the integrated water resources management policy of the Government of Balochistan (GoB). The project will improve agricultural production in the project area by: (1) improving and constructing irrigation infrastructure, (2) developing command area and establishing and/or rehabilitating watershed protection and (3) strengthening institutional capacity. The project consists of development of 11 subprojects in Zhob and Mula river basins. The proposed project will construct and improve irrigation land of about 17,592 hectares (ha), and benefit about 42,900 farmers in the Balochistan province.

Current project “Construction of Water Resources (WR) Building, Quetta” is also part of the BWRDS project. The proposed WR building site is located in Quetta city adjacent to Chaman Railway Crossing, Jaffar Khan Jamali Road, in Quetta.

1.2 PROJECT LOCATION

The proposed project is located on Mir Jaffar khan Jamali Road,Mulana Abdul Aziz street near chaman pattak, Quetta at UTM coordinates N 301200 m, E 670011 m Zone 42R.. Proposed project is located in the vicinity of office of Project Director 100 Dams, Irrigation Department Balochistan . The site can be accessed through Jaffer Khan Jamali road.

1.3 SALIENT FEATURES OF THE PROJECT

The sub project is aimed to construct a new three story water resources building by demolishing older one. The objective of the project is to provide Eco-Friendly Water Resources building with outward patios bringing nature into workplace. Salient features of the project are

- Ground floor covered area = 10,313 sq. ft
- 1st floor covered area = 10,085sq. ft
- 2nd floor covered area = 10,085 sq.ft.
- Mumty covered area = 1128 sq.ft
- Total covered area of Building = 31,611sq. ft

There are total 4 Data Centers on 1st and 2ndfloor, central library on 1st floor and conference hall on 2ndfloor. There are two fire exits in building on each wing. Façade of the building is on modern contemporary lines with maintenance free building materials. The 3D front elevation of the Water Resources Building is shown below.

3D front elevation of the Water Resources Building

1.4 ENVIRONMENTAL ASSESSMENT

The apex Pakistani law governing the subject of environment is the Pakistan Environmental Protection Act – 1997 (PEPA-97). Under Section 12 of the Act, it is mandatory for the proponents of the projects1 to execute the IEE and / or EIA (where warranted), and get the approval from federal agency (i.e., Pak-EPA). This function has been delegated under Section 26 to provincial EPAs.

After the 18th amendment to the constitution of Pakistan, environment became a provincial subject, and the environmental law governing the Construction of Water Resources (WR) Building, Quetta is the "Balochistan Environmental Protection Act 2012". This act also provides for IEE or EIA (as the case maybe) for projects under its clause 15.

The EIA / IEE regulations of 2000 provide categories of projects for which IEE or EIA needs to be conducted. The proposed project falls under the category of "Water management, dams, irrigation & flood protection" and hence the environmental study is conducted and an IEE report is being prepared.

For ADB's SPS, all loans and investments are subject to categorization to determine environmental assessment requirements. Categorization is to be undertaken using Rapid Environmental Assessment (REA) and requires the completion of the environmental categorization form. REA was filled by consultants and is attached as Annexure 1.

According to ADB's Safeguard Policy Statement (SPS) 2009, a Rapid Environmental Assessment (REA) Checklist was prepared for the proposed Water Resources Building works. The Pakistan Environmental Protection Agency's "Guidelines for the Preparation and Review of Environmental Reports (2000)" were also consulted. Based on the limited scope of the works, this sub-project has been classified as Category 'B', requiring

Based on the above requirements of national and provincial regulations, as well as the ADB policy, an Initial Environmental Examination of the proposed interventions is being carried out.

The overall objective of IEE study is to elucidate the anticipated aspects of the proposed project and their impacts on the surrounding environment in order to propose necessary mitigation measures to prevent/minimize adverse impacts. To achieve this objective, an assessment of the existing environmental status of the project site is a prerequisite and, therefore, included in this study by collecting and reviewing the baseline data of various environmental attributes.

The IEE report will be prepared to ensure adequate environmental and social management during the lifecycle of the project for the previously mentioned interventions of the Water resources building.

It intends to provide mechanisms for ensuring that potential environmental and social impacts of the current program are identified, assessed and mitigated as appropriate, through an environmental and social screening process.

The IEE report is also required to, comply with the Pakistan / Balochistan Environmental and social requirements, as outlined in the prevailing IEE / EIA Guidelines. The IEE will also comply with the ADB Safeguard Policies SPS – 2009 for environmental management of projects.

1.5 MORE SPECIFIC OBJECTIVES OF IEE REPORT

More specific objectives of this IEE report include following:

i. Meet the statutory requirements set forth by the Pakistan Environmental Protection Act (PEPA) 1997 and the Balochistan Environmental Protection Act 2012.
ii. Comply with ADB policies and safeguards for environmental and social management of Projects.
iii. Facilitate proponents and financiers of the project in ensuring environmental and social acceptability of the project
iv. Establish a baseline of existing environmental status at the project site prior to project initiation by collecting secondary and primary data/information on physical, biological and social environment of the project area.
v. Help the project proponents to incorporate necessary measures for legally compliant and socially acceptable environmental performance of their project.
vi. Identify significant environmental impacts (both positive and negative) during all stages of the project implementation and propose mitigation measures for negative impacts

1.6 STRUCTURE OF THE REPORT

This report is divided into following chapters:

Chapter No.1: Introduction

Chapter No. 2: Policy, Law and Administrative Framework

Chapter No. 3: The Project Description

Chapter No. 4: Environmental Baseline Conditions

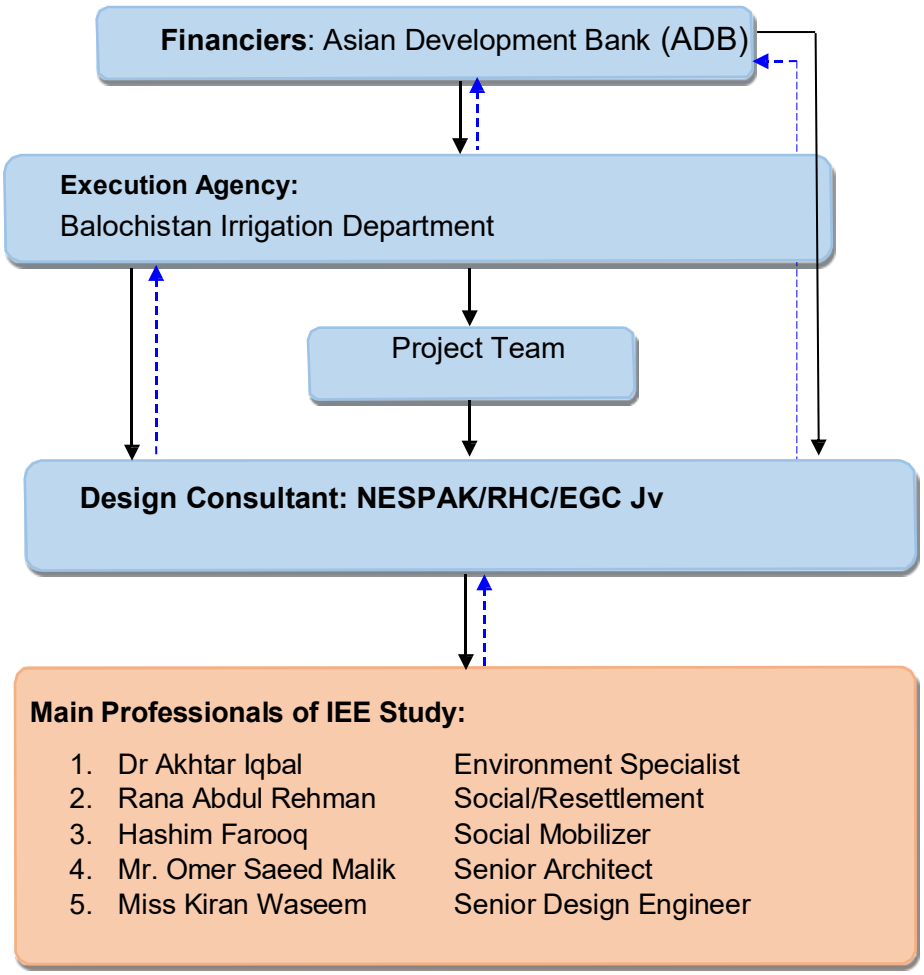
Chapter No. 5: Public Consultations

Chapter No. 6: Impact Assessment, Mitigation and Enhancement Measures

Chapter No. 7: Environmental Management Plan

Chapter No. 8: Conclusions & Recommendations

1.7 IEE TEAM ARRANGEMENT



CHAPTER - 2
LEGAL AND ADMINISTRATIVE FRAMEWORK POLICY

2. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

2.1 GENERAL

This chapter elucidates the current legal framework which is applicable on the proposed project in context of environment and sustainable development. The institutional arrangement that exists in Pakistan and may influence the environmental management of the proposed project is also discussed in this chapter. This IEE report also conforms with the guidelines as provided in ADB's Safeguard Policy Statement (SPS) 2009.

2.2 BACKGROUND

The Government of Pakistan realized the importance of environmental preservation way back in the early 1980's. Until the 1980's development policies were formulated irrespective of environmental considerations. A variety of environment-related acts and ordinances existed, but the Pakistan Environmental Protection Ordinance 1983 (PEPO) was the first effort to deal with environmental concerns systematically. The ordinance created a legal basis for comprehensive environmental policy making, the establishment and enforcement of standards, environmental impact assessments and the inclusion of environmental considerations in development policies. In 1984, the promulgation of this ordinance was followed by the establishment of the Pak-EPA, the primary government institution dealing with environmental issues. The PEPO 1983 was replaced with a new Act of Parliament in 1997 i.e., PEPA Act 1997.

The UN International Summit on Environment was held in 1992 in Rio de Janeiro, to highlight the importance of environment protection and to promote sustainable development. Pakistan also became a signatory of this summit, after which the Government of Pakistan developed a National Conservation Strategy (NCS), approved in March 1992. It was decided that all reports regarding strategies, policies and program for sustainable development will be drawn up on the basis of the NCS. Another major environmental policy initiative formulated in 1999 was Environmental Planning and Resource Conservation Project (EPRCP).

The enactment of PEPA 1997 took up the key issues of PEPO and in addition provided for a considerable strengthening of institutions at the national and provincial level for the formulation, execution and enforcement of environmental policies and conferred broad-based enforcement powers to the EPA. NEQS for municipal and liquid industrial effluent, industrial gaseous emissions and motor vehicle exhaust and noise, were issued by Pakistan EPA in 1994.

Pakistan EPA review of IEE and EIA Regulations, 2000 and Pakistan Environmental Assessment Procedures were published, to provide necessary guidelines for preparation, submission and review of IEE and EIA.

2.3 NATIONAL ENVIRONMENTAL POLICY

The National Environment Policy aims to protect, conserve and restore Pakistan's environment in order to improve the quality of life of the citizens through sustainable development. The Policy provides broad guidelines for addressing environmental concerns and ensuring effective management of their environmental resources. The provincial, AJK, Northern Areas and local governments, however may devise their own strategies, plans and programs in pursuit of this Policy.

Enforcement of the policy is being carried out through National Environmental Quality Standard (NEQS) and Self-Monitoring & Reporting Tools (SMART) in order to optimize energy and environmental resource consumption within the industries; encourage reduction, recycling and reuse of municipal and industrial solid and liquid wastes; introduce discharge licensing system for industry; devise and implement master plans for treatment of municipal and industrial wastewater in urban and rural areas. The policy

has not been revised since 2005.

2.4 BALOCHISTAN ACQUISITION OF LAND ACT 1974 & (AMENDMENT) ORDINANCE 1976

The primary law for acquisition of land for public purposes in Pakistan is the “Land Acquisition Act, 1894” (hereinafter referred as the Act). The land acquired under the Act vests in the Province and it is only thereafter that the Province may transfer it to someone else.

The Balochistan Acquisition of Land Act allows the government to acquire private land for housing or development schemes. Initially, the law specifically mentioned “in rural areas”, but this was deleted subsequently through the Ordinance in 1976. “Land Acquisition” literally means acquiring of land for some public purpose by government/government agency, as authorized by the law, from the individual landowner(s) after paying a government fixed compensation in lieu of losses incurred by land owner(s) due to surrendering of his/their land to the concerned government agency. The laws essentially are developments on the land acquisition act of 1894 which was created with the purpose of facilitating acquisition by the government of privately held land for public purposes. The word "public purpose", as defined in the act, refers to the acquisition of land for constructing educational institutions or schemes such as housing, health or slum clearance, as well as for projects concerned with rural planning or formation of sites. It is not necessary that all the acquisition has to be initiated by the government alone. Local authorities, societies registered under the society’s registration act, 1860 and co-operative societies established under the co-operative societies act can also acquire the land for developmental activities through the government.

Land acquisition requires interaction between the Requiring Body (RB), which is normally a government agency that requires the land for certain national development project, and the Acquiring Body (AB), which is normally the Provincial Revenue Board, since land is a provincial subject according to the Constitution. The division of responsibility between the Requiring Body and the Acquiring Body in broad terms is that the Requiring Body provides the technical input and the Acquiring Body provides the legal input in the land acquisition process. It is the Requiring Body which must ensure that the project, for which the acquisition of land is required, is approved by the authorities and that funds are available. The Requiring Body must also justify the need for land and other property on the basis of field surveys including detailed engineering design and prepare all necessary documents required for decision making.

It is to be noted here that no acquisition of privately held land is envisaged for the said project.

2.5 ENVIRONMENTAL LEGISLATIONS

The key environmental regulations and legislations which are applicable to the proposed project is discussed below.

2.5.1 National Regulations

The environmental policy framework, which will govern the project, is the NCS of Pakistan. The Pakistan NCS is a broad-based policy statement aimed at achieving environmentally sustainable social and economic development in Pakistan. The three overriding objectives of the NCS are:

- Conservation of natural resources
- Sustainable development
- Improved efficiency in the use and management of resources

Three operating principles are identified to achieve these objectives. These are:

- Greater public participation in development and environmental management
- A merging of environmental and economic decision making
- Lasting improvements in the quality of life

The NCS specifies the basic guidelines for an integrated effort aimed at protecting the environment and the natural resources of the country. This broad framework provides a comprehensive point of reference for all agencies, departments, private sector companies, financial institutions, and donor agencies for undertaking systematic efforts to bring about an effective change for sustainable development.

2.5.2 Pakistan Environmental Protection Act, 1997

The PEPA 1997 is the apex environmental law of the country. Under section 12 of the Act, it is mandatory for the proponents of the projects[7] to execute the IEE and / or EIA (where warranted), and get the approval from provincial EPA.

The following rules and regulations have been issued under the Pakistan Environmental Protection Act, 1997.

Rules:

- National Environmental Quality Standards (Self-monitoring and Reporting by Industries) Rules, 2001.
- Provincial Sustainable Development Fund (Procedure) Rules, 2001.
- Pakistan Sustainable Development Fund (Utilization) Rules, 2001.
- Pollution Charge for Industry (Calculation and Collection) Rules, 2001.
- Environmental Tribunal Procedures and Qualifications Rules, 2000.
- Environmental Samples Rules, 2001.
- Hazardous Substance Rules, 2000

Regulations:

- Review of IEE / EIA Regulations, 2000.
- National Environmental Quality Standards (Certification of Environmental Laboratories) Regulations, 2000.

2.5.3 Balochistan Environmental Protection Act, 2012

After the 18th Constitutional amendments, the subject of environment vide Notification No.4-9/2011-Min dated 29th June, 2011 stand devolved to the provinces with effect from 1st July, 2011. Even after the deletion of the subject of environment from the concurrent list, the Pakistan Environmental Protection Act 1997 remained intact as per Article 270-AA, Sub Article (6). However, there is provision that the province, through an appropriate legislature / competent authority, may alter, repeal and amend the laws related to the subject.

To regulate and effectively address the peculiar environmental issues of the province of Balochistan this act namely “Balochistan Environmental Protection Act 2012” is submitted as per provisions of the Article 270-AA, Sub-Article (6) of 18th Constitutional amendments.

In terms of requirements of EIA / IEE, the provincial Act contains, in its section 15, similar provisions as given in the PEPA section 12. The PEPA has entrusted the authority of review and to approve environmental assessments to the provincial EPA. The proposed project falls under the jurisdiction of the Balochistan Environmental Protection Agency (BEPA).

This IEE report will need to be submitted to EPA (B) for grant of environmental NOC. An interesting provision of the provincial Act, which is relevant for the proposed project, is

given in its section 20. Sub-section 2 of Section 20 states that "When preparing water resource management plans, Departments and other relevant institutions shall at least take the following into account:

- Provisions for integrated watershed management;
- Regulation of sustainable abstraction of groundwater;
- Regulation of the use of ground or surface water for agricultural, industrial, mining, and urban purposes;
- Measures to protect human health and ecosystems;
- Measures to protect wetlands and their associated ecosystems;
- Any other provision necessary for the sustainable use and management of water resources.

2.5.4 Pakistan EPA Review of IEE and EIA Regulations, 2000

Two types of environmental assessments can be carried out i.e., IEE and EIA. EIAs are carried out for the projects that have a potentially significant environmental impact, and IEEs are conducted for relatively smaller projects with some relatively lesser significant impacts.

The Review of IEE and EIA Regulations 2000, prepared by Pak-EPA under the powers conferred upon it by PEPA-97, categorizes projects for IEE and EIA, respectively. The proposed interventions under Karakh-Mula River are likely to fall under the Category B as defined in Schedule – I of Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000. According to these guidelines, the proposed project would require an IEE to be conducted.

According to the details provided in the regulations regarding preparation, submission, and review of IEE's and EIA's, following is a brief description of the approval process.

a. A project is categorized as requiring an IEE or EIA using the two schedules attached to the regulations.
b. An EIA or IEE is conducted as required and following the Pak-EPA guidelines.
c. The EIA or IEE is submitted to the concerned EPA: provincial EPAs if the project is located in the provinces or Pak-EPA if it is located in the Federal administered area.
d. A non-refundable review fee, depending on the cost of the project and the type of the report, is submitted along with the document as per the rates shown in Schedule III.
e. The submittal is also accompanied by an application in the format prescribed in Schedule IV of the regulations.
f. The EPA conducts a preliminary scrutiny and replies within 10 days of the submittal of a report, (i) confirming completeness, or (ii) asking for additional information, if needed, or (iii) returning the report requiring additional studies, if necessary.
g. The EPA is required to make every effort to complete the IEE and EIA review process within 45 and 90 days, respectively, for the issue of confirmation of completeness.
h. When the EPA accord their approval subject to certain conditions:
i. Before commencing construction of the project, the proponent is required to submit an undertaking accepting the conditions.
j. Before commencing operation of the project, the proponent is required to obtain from the EPA a written confirmation of compliance with the approval conditions and requirements of the IEE.

k. An environmental management plan (EMP) is to be submitted with a request for obtaining confirmation of compliance.
l. The EPA is required to issue confirmation of compliance within 15 days of the receipt of request and complete documentation.
m. The IEE approval is valid for three years from the date of accord. The proponents are required to complete the construction and installation within this time period and start operations. In case of any delays, the proponents are required to obtain extension from EPA.

2.5.5 Forest Act 1927

The Forest Act, 1927 was largely based on previous Indian Forest Acts implemented under the British. The first and most famous was the Indian Forest Act of 1878. Both the 1878 act and the 1927 one sought to consolidate and reserve the areas having forest cover, or significant wildlife, to regulate movement and transit of forest produce, and duty leviable on timber and other forest produce. It also defines the procedure to be followed for declaring an area to be a Reserved Forest, a Protected Forest or a Village Forest.

This Act is not relevant as the project does not does not lie in any of the notified forest land of Balochistan.

2.5.6 The Antiquities Act, 1975

This act basically defines how to repeal and re-enact the law relating to the preservation and protection of antiquities. The Federal Government may, by notification in the official Gazette, declare any antiquity to be a protected antiquity for the purposes of this Act. No person shall put any neon signs or other kinds of advertisement, including bill posting, commercial signs, poles or pylons, electricity or telephone cables and television aerials, on or near any protected immovable antiquity. No person shall, for any commercial purpose, make a cinematograph film of any protected antiquity or any part thereof except under, and in accordance with, a license granted by the Director. A contravention of any provision of this Act or the rules shall, where no punishment has been specification provided, be punishable with rigorous imprisonment for a term which may extend to six months, or with fine which may extend to five thousand rupees, or with both.

2.5.7 Pakistan Penal Code 1860

The Pakistan Penal Code usually called PPC is a penal code for all offences charged in Pakistan. It was originally prepared on the behalf of the Government of British India. After the partition of India in 1947, Pakistan inherited the same code and subsequently after several amendments by different governments, it is now a mixture of Islamic and English Law. Presently, the Pakistan Penal Code is still in effect and can be amended by the Senate of Pakistan.

2.5.8 Government of Pakistan Guidance on Managing COVID-19 Risks

Government of Pakistan issued Guidelines “Health & Safety of Building and Construction Workers during COVID-19 outbreak” to Managing COVID-19 Risks while Commencing Work in Construction Project, on 11 April 2020. Taking into account these guidelines, the contractor will prepare Site-specific EMP (SSEMP), Site Specific Health and Safety Management Plan (SSHSMP) and a Standard Operational Procedure (SOP) to manage COVID-19 risks. These plans will be approved by Supervision consultant

2.5.9 The Balochistan Wildlife Protection (Amendment) Ordinance, 2001

The Wildlife Protection Ordinance empowers the government to declare certain areas reserved for the protection of wildlife and control activities within these areas. It also provides protection to endangered species of wildlife. As no activities are planned in notified protected areas, no provision of this law is applicable to the proposed project.

2.5.10 Balochistan Ground Water Rights Administration Ordinance 1978

This law was promulgated to ensure efficient and site-specific management of scarce water resources in Balochistan. The background to the law suggests admission that hydrological conditions in the entire Balochistan vary a great deal from place to place. Hence this Ordinance requires establishment of a Provincial Water Board and District Level Water Committees. The Provincial Water Board shall have representation from the Planning & Development Department, Revenue Department, and Irrigation Department etc., thereby clearly identifying major stakeholders. The Ordinance also calls for registration of all water sources and establishes protocols for grant of permits by water committees for use of such sources. The statement of objectives for the Ordinance stipulates that the Provincial Water Board shall identify areas with ground water resources and declare them as Designated Ground Water Basins. It also calls for establishment of suitable laws for all designated ground water basins.

2.5.11 Building Regulations

Building Code for Quetta Municipality, 1937 and the Balochistan Building and Town Planning Rules, 1979 are functioning in the city and applied on all building projects. The Local Government Department of Balochistan has drafted Balochistan Building Control and Town Planning Rules, 2021 which shall replace above mentioned building rules. The same has been uploaded for General Public for rendering suggestions/ feedback so that the document could be improved and the final draft could be placed before the Provincial Government for approval.

2.6 INSTITUTIONAL SETUP FOR ENVIRONMENTAL MANAGEMENT

The structural setup of agencies/departments in the environmental sector is such that the Provincial Ministry of Environment governs and regulates environment-related work at the government level. The BEPA works directly under the control of ministry.

2.6.1 Provincial Environmental Protection Council (Provincial EPC) and the Balochistan Environmental Protection Agency (BEPA)

After devolution of the subject environment to provincial level under 18th amendment, these two organizations are primarily responsible for administering the provisions of the Balochistan Environmental Protection Act 2012. The EPC oversees the functioning of the BEPA. Its members include the representatives of the government, industry, nongovernmental organizations and the private sector. The EPA is required to ensure compliance with the National Environmental Quality Standard (NEQS), establish monitoring and evaluation systems, and both identify the need to, as well as initiate legislation whenever necessary. It is thus the primary implementing agency in the hierarchy. The NEQS for effluent discharge standards, gaseous emissions, vehicular emissions, drinking water and ambient air quality is attached as **Annexure 2** of this report.

Another function of the provincial EPA are the review and approval of environmental assessment reports.

2.7 ASIAN DEVELOPMENT BANK SAFEGUARD POLICIES

2.7.1 ADB Requirements for Preparation of Environmental Assessments of Projects

Asian Development Bank in its Safeguard Policy Statement (June 2009) affirms that "environmental and social sustainability is a cornerstone of economic growth and poverty reduction in Asia and the Pacific" (p 14). Furthermore, the document underlines the ADB's Strategy 2020, promoting the "sustainability of project outcomes by protecting the environment and people from project's potential adverse impacts".

The Initial Environmental Examination in hand is fully committed to the requirements determined in the "ADB Safeguard Policy Statement". The environmental works carried out by NESPAK JV on behalf of project proponents have been essentially guided by these rules as enunciated in the "Outline of an Initial Environmental Examination Report".

In the light of significance attached by ADB to various environmental impacts, Project is classified as Category B project, wherein an Initial Environmental Examination is required.

Main reasons behind assigning category B are that the interventions are basically upgradation and rehabilitation of existing irrigation system and no resettlement is envisaged. However, an environmental assessment using ADB's Rapid Environmental Assessment (REA) checklist for urban development and water supply, was filled by PPTA consultants and results of the assessment show that the projects are unlikely to cause significant adverse impacts. This initial environmental examination (IEE) has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subprojects.

Thus, an Initial Environmental Examination (IEE) of the project has been conducted, through the following documents: -

- Review and data collection;
- Field visits and public consultation;
- Derive Baseline Condition for the area of influence of proposed work scheme;
- Alternative Analysis
- Impact identification and analysis, and planning and recommendation of mitigation measures;
- Preparation of an environmental management and monitoring plan.

2.7.2 ADB Safeguard Policy 2009

Safeguard policies are generally understood to be operational policies that seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process. ADB's safeguard policy (2009) framework consists of three Safeguard Policies on the environment, involuntary resettlement and indigenous peoples. These are accompanied by Operations Manual sections on Environmental Considerations in ADB Operations; Involuntary Resettlement; and Indigenous Peoples. All three safeguard policies involve a structured process of impact assessment, planning, and mitigation to

address the adverse effects of projects throughout the project cycle. The safeguard policies require that

- Impacts are identified and assessed early in the project cycle;
- Plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and
- AP are informed and consulted during project preparation and implementation.

The Project will need to comply with all the Safeguard Policies in the subproject or activities, irrespective of whether or not they are being funded in whole or in part by the ADB, the GoP, or any other donor. A brief synopsis of these policies and their relevance for the proposed project is given in the **Table 2-1.**

Table 2-1 ADB Safeguard Policy 2009 Relevant to Project

S. No.	Safeguard Policies	Key Requirements	Remarks
1.	Environment	Projects and subprojects need IEE to address important issues not covered by any applicable regional or sectoral EA.	Applicable to proposed project
2.	Involuntary Resettlement	Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher	As of now, no involuntary resettlement is envisaged for the proposed project. However, an illegal encroacher is using small part of Flood channel land for agriculture purpose, that will be compensated. This policy may not be applicable.
3.	Indigenous Peoples	Measures to avoid potentially adverse effects on the Indigenous Peoples' communities; and when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and intergenerationally inclusive.	There are no groups of people in the project area who could be categorized as indigenous people, therefore this policy does not apply to the proposed project.

2.8 COMPARISON OF INTERNATIONAL AND LOCAL ENVIRONMENTAL LEGISLATIONS

The ADB's SPS 2009 requires application of pollution prevention and control

technologies and consistency with international good practice, as reflected in internationally recognized standards. The SPS states that when host country regulations differ from these standards, the EA will achieve whichever is more stringent.

In order to select the most stringent standards applicable, a comparison of local (PEQS) and international i.e., International Financing Corporation (IFC)/ World Health Organization (WHO) and United States Environmental Protection Agency (USEPA) regulations have been made, as shown in Table 2.2 below. For air quality, comparison was only possible for pollutants having same averaging periods in PEQS, IFC and WHO. PEQS for ambient air quality are more stringent in comparison to USEPA and WHO/IFC standards, in the case of most pollutants.

Similar to the standards for air quality, the comparison of noise standards provided in Table 2.3 clearly shows that PEQS for noise are more stringent in comparison to the WHO/IFC standards. The only exception is the daytime noise level standard for Industrial areas where the WHO/IFC standard is more stringent (70 dB (A)) in comparison to PEQS (75 dB (A)) and so for this particular parameter, the WHO/IFC standard will be used.

As far as regulations regarding other environmental parameters are concerned such as acceptable effluent disposal parameters, the local regulations i.e., PEQS are more stringent and would be preferred over any other international regulations such as WHO/IFC.

Similar to the standards for air and Noise quality, the comparison of Water quality standards provided in Table 2.4 clearly shows that PEQS for biological and physical parameters of drinking water quality are same as for WHO standards except for Total hardness as CaCO3. PEQS for Chemical, Toxic inorganic and organic parameters are mostly similar/comparable zinc, residual chlorine, Phenolic compounds (as Phenols) mg/l, Poly-nuclear aromatic hydrocarbons (as PAHs) g/l. WHO for Lead and Zn are more stringent comparatively.

Table 2-2 Comparison of International and Local Air Quality Standards

Pollutants	USEPA		WHO/IFC		PEQS	
	Avg.Time	**Standard**	**Avg.Time**	**Standard**	**Avg.Time**	**Standard**
SO_2	3 hrs	0.5 ppm	24 hr	125 µg/m^3 (IT-1*)	Annual Mean	80 µg/m^3
	1 hr	75 ppb	10 min	500 µg/m^3	24 hr	120 µg/m^3
CO	8 hrs	9 ppm (11 mg/m^3)	-	-	8 hrs	5 mg/m^3
	1 hr	35 ppm (43 mg/m^3)			1 hr	10 mg/m^3
NO_2	Annual Mean	100 µg/m^3 (53 ppb)	1 yr	40 µg/m^3	Annual Mean	40 µg/m^3
	1 hr	(100 ppb)	1 hr	200 µg/m^3	24 hrs	80 µg/m^3
O_3	8 hrs	0.07 ppm (148 40 µg/m^3)	8 hrs	100 µg/m^3	1 hr	130 µg/m^3
PM_{10}	24 hrs	150 µg/m^3	1 yr	70 µg/m^3 (IT-1*)	Annual Mean	120 µg/m^3
			24 hr	150 µg/m^3 (IT-1*)	24 hrs	150 µg/m^3
PM_{25}	Annual Mean	15 µg/m^3	1 yr	35 µg/m^3	Annual Average	15 µg/m^3

					(IT-1*)	
	24 hrs	35 µg/m^3	24 hr	75 µg/m^3	24 hrs (IT-1*)	35 µg/m3
					1 hr	15 µg/m^3

*IT- 1 as specified by WHO=AQG, 2005

Table 2-3 Comparison of International and Local Noise Standards

Category of Area/Zone	Limit in dB(A) Leq			
	PEQS		WHO/IFC	
	Day Time	Night Time	Day Time	Night Time
Residential area (A)	55	45	55	45
Commercial Area (B)	65	55	70	70
Industrial Area (C)	75	65	70	70
Silence Zone (D)	50	45	55	45

There are no national standards for surface water quality. Instead, drinking water quality and effluent discharge (to inland waters) are listed below. The latter standard assumes a dilution factor of 10 to 1 at discharge and at this dilution is taken as an indicator of acceptable surface water quality.

Table 2-4 Comparison of National and WHO Environmental Quality Standards for Drinking Water

Properties/Parameters	Standard values	WHO standards	Remarks
Biological			
All water intended for drinking (E. Coli or Thermo-tolerant Coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water entering the distribution system (E. Coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water distribution system (E. Coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12-month period.	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12-month period.	Most Asian countries also follow WHO standards
Physical			
Colour	≤15TCU	≤15TCU	
Taste	Non objectionable/ Acceptable	Non objectionable/ Acceptable	
Odour	Non objectionable/ Acceptable	Non objectionable/	

Properties/Parameters	Standard values	WHO standards	Remarks
		Acceptable	
Turbidity	<5NTU	<5NTU	
Total hardness as CaCO3	<500mg/l	---	
TDS	<1000	<1000	
Ph	6.5 – 8.5	6.5 – 8.5	
Chemical			
Essential Inorganic	mg/Litre	mg/Litre	
Aluminum (Al) mg/l	≤0.2	0.2	
Antimony (Sb)	≤0.005 (P)	0.02	
Arsenic (As)	≤0.05 (P)	0.01	Standard for Pakistan similar to most Asian developing countries
Barium (Ba)	0.7	0.7	
Boron (B)	0.3	0.3	
Cadmium (Cd)	0.01	0.003	Standard for Pakistan similar to most Asian developing countries
Chloride (Cl-)	<250	250	
Chromium (Cr)	≤0.05	0.05	
Copper (Cu)	2	2	
Toxic Inorganic	mg/l	mg/l	
Cyanide (CN)	≤0.05	0.07	Standard for Pakistan similar to most Asian developing countries
Fluoride (F)*	≤1.5	1.5	
Lead (Pb)	≤0.05	0.01	Standard for Pakistan similar to most Asian developing countries
Manganese (Mn)	≤0.5	0.5	
Mercury (Hg)	≤0.001	0.001	
Nickel (Ni)	≤0.02	0.02	
Nitrate (NO_3) *	≤50	50	
Nitrite (NO_2) *	≤3 (P)	3	
Selenium (Se)	0.01 (P)	0.01	
Residual chlorine	0.2-0.5 at consumer end 0.5-1.5 at source		
Zinc (Zn)	5.0	3	Standard for Pakistan similar to most Asian developing countries
Organic			
Pesticides mg/l			PSQCA No. 4639-2004, Page No. 4 Table No. 3 Serial No. 20-58 may be consulted. **
Phenolic compounds (as Phenols) mg/l		0.002	
Poly-nuclear aromatic hydrocarbons (as PAHs) g/l		0.01 (By GC/MS methods)	
Alpha Emitters bq/L or pCi	0.1	0.1	
Beta emitters	1	1	

CHAPTER -3
THE PROJECT

3. THE PROJECT

3.1 BACKGROUND

Balochistan is the largest province of Pakistan in terms of area and smallest in terms of population. It is reckoned to be comparatively less developed and the sole reason is scarcity and paucity of water. Islamic Republic of Pakistan received a loan (3700-PAK) from the Asian Development Bank (ADB) for financing the Balochistan Water Resources Development Sector Project (BWRDSP). The project will support implementation of the integrated water resources management policy of the Government of Balochistan (GoB).

Government of Balochistan has now hired the services of the Consultants[1] for Project Design, Construction Supervision and Implementation Support (hereafter called 'the Consultants' for Balochistan Water Resources Development Sector Project (BWRDSP). The project consists of development of 11 subprojects in two river basin (Mula & Zhob). Construction of Water Resources (WR) Building at Quetta is also part of this project. The Consultants will help GoB in preparing detailed design of three core sub-projects and also feasibility studies and detailed design of the balance of eight non-core sub-projects.

3.2 THE PROJECT

The proposed project is located on Mir Jaffar khan jamali road,Mulana Abdul aziz street near chaman pattak, Quetta at UTM coordinates N 3437108 m, E 551554 m Zone 42R.. Proposed project is located in the vicinity of building of Irrigation Department, Balochistan and consultant's office of 100 Dams Balochistan project.

[1] Design and Construction Supervision Consultant were recruited and mobilized in August 2019 under the ADB Loan 3700-PAK (2019).

The project design is reflected by the following data

- Plot Status = Government land
- Structure Height above base = 61.75 feet
- Number of Floors = 3
- Ground floor covered area = 10,313 sq. ft.
- 1st floor covered area = 10,085sq. ft
- 2nd floor covered area = 10,085 sq.ft.
- Mumty covered area = 1128 sq.ft
- Total covered area of Building = 31,611sq. ft
- Power Supply Requirements = 11kV
- Septic Tank = Depth (6 ft), Width (8 ft), Length (17 ft)
- size of Underground Water Tank = 12 ft x 10 ft x 5.5 ft(capacity of 3000 gallons)
- Size of Two roof water tanks = 12 ft x9 ft x 2.5 ft (capacity of 1,500 gallons each)

3.3 CONSTRUCTION & COMMISSIONING

3.3.1 Construction Schedule

It is anticipated that construction of the project will be completed in about 18 months from the date of start of construction activities. The construction and commissioning phase will consist of following major activities:

- Construction of campsite including facilities and mobilization of contractors
- Construction of foundations and auxiliary structures (piling, civil works etc.)
- Internal and External finishing
- Mechanical, electrical and other works
- Demobilization and site restoration

3.3.2 Pre-Construction / Design Phase

This, the essential phase provides the basis for the construction program, the methodology to be adopted and the technologies to be involved. The project site has been assessed in terms of its geology, seismicity and seismo-tectonics. A detailed geo-technical investigation has been conducted and load bearing capacity of the soil has been stablished. The pre-construction activities will involve earthworks & excavations. Geotechnical investigations comprised drilling of boreholes, performance of field testing, collection of disturbed and undisturbed soil samples and laboratory testing. The on-site soils mainly comprise Lean Clay (CL) up to the maximum investigated depth of 10 m below NSL. Groundwater was not encountered in any of the boreholes. Generally, subsurface of moderate strength is available at the project site. Hence, considering the subsurface soil profile, nature of structure to be constructed, literature review and past experience of similar projects; mat foundation is considered suitable for supporting proposed building. The recommended depth for mat foundation is 1.5 meter.

3.3.3 Construction Activities

The Project design is based essentially on reinforced concrete construction. All beams and columns are reinforced concrete. Structural elements e.g. Beam-column and Walls with raft foundation are combined in various ways to create structural systems for the building. Concrete Special moment resisting frame system is adopted as a framing system. Standard & environmentally compatible construction materials (cement, sand, steel reinforcement, bricks etc.) & techniques / construction practices will be employed besides adopting Standard Operating Procedures set-out in the Environmental Management Plan.

i) Construction office & Camp

The construction contractor will develop his own camp & offices for construction purposes within the project site. Development of campsite will include the following activities:

- Leveling and compaction of the area for office and campsite
- Provision of drainage works in and around the campsite
- Laying and compaction of the gravel topping in the office and campsite
- Construction of fuel storage tank area and water tank
- Provision of fence, access and emergency gates
- Construction of septic tanks
- Installation of security guard cabins
- Installation of sewerage pipeline with manholes for the septic system and connecting it with Sewer line
- Provision of signage for each activity center

ii) Foundations

Excavation for the foundations work will be made in accordance with recommendation of Geotechnical investigation. Excavated material will be properly stored on suitable site and will be utilized in construction new water resource building.

iii) Building Shell and Core Construction

Construction of the exterior enclosure or "shell'' of the building include construction of the building's framework (installation of beams and columns), floor decks, facade (exterior walls and cladding), and roof construction. These activities require the use of cranes, compressors, personnel and material hoists, front-end loaders, concrete pumps, on-site bending jigs and a variety of hand-held tools, in addition to the delivery trucks bringing construction materials to the site. At the same time, infrastructure connections are built. These include lines for water, sewer, storm water, electricity and telecommunications.

iv) Interior Construction and Finishing

This stage includes the construction of interior walls, installation of lighting fixtures and interior finishes (flooring, painting, etc.), as well as mechanical & electrical works such as the:

- Installation of elevators
- Internal and external pipe works
- Fire protection & Life safety systems
- Electrical Distribution
- Emergency Lighting installations
- Lightning Protection

v) Civil Works

Civil works involves excavation, piling, formwork, reinforcement, concreting, masonry, plastering, painting, tinsmith's, and, construction of light separating walls, hung ceilings, flooring, lining and facing.

vi) Construction Equipment & Machinery

Conventional machinery and equipment will be used for construction activities. The equipment and machinery may include dozers, excavators, loaders, mobile crane, lorry, dump trucks, back hoe, bar bending machine, water bowzers, material hoist, concrete placement booms & power generators.

vii) Construction Material and other Supplies

Main construction material to be used during the construction phase will include ready mix concrete that will be sourced through reputable companies. Additionally, paints, glass, wood, tiles, aluminum, PVC pipes, concrete/cement pipes, electric cables, etc. will be used during the different phases of construction. The materials will be transported by trucks to the project site, where they will be stored until moved to different locations as and when required. Materials including paving stone, crush, gravel and sand will be brought from commercial quarries located in the Balochistan Province. Other general supplies transported will include office and camp supplies (food etc.) fuels, oils and equipment maintenance parts.

viii) Site Restoration

On the completion of the construction phase, the entire site will be built-up thus no site restoration to original condition is required. External sites are not being used.

3.3.4 Utility requirements

The requirements of the utility services are discussed below.

Water Supply System: Water requirement during the operation phase of Water Resources building will be about 9,000 gallons per day for which the Proponent has adequate arrangement for purification of water from the underground aquifers. Existing water supply network shall be used for supply of water to the users of the building. Connection shall be taken from the existing line passing along the boundary of the building. Water will be stored in an underground water tank. Water from the underground water tank will be supplied to an overhead tank located on top of the building. The water will be supplied to the users from the overhead tank.

Ample storage has been provided in the form of groundwater and overhead water tank. The storages available in the form of ground and overhead storage tank will facilitate in hourly variations of water demand. The underground water tank will be sufficient to meet any emergency and peak demand of the building. A 4,000-gallon tank has been proposed which will be located near the building.

Two roof water tanks with a size 12 ft x9 ft x 2.5 ft (capacity of 1,500 gallons each) have been planned on top of roof of the building. This capacity will be sufficient to meet full day domestic demand of the users of the building on the basis of average daily consumption.

High density polyethylene (HDPE) and Poly Propylene Random (PPR) pipes will be used in the plumbing (Water Supply System). These pipes are manufactured locally.

Transmission Lines from Underground Water Tank to Overhead Tank:2 Horizontal Centrifugal Pumps (1 working and 1 standby) of capacity 50 gallons/minute each with a head of 70 ft and 2 HP motor have been recommended in the design.

Sewerage and storm water drainage system: Internal plumbing system to convey wastewater from various sources consists of upvc pipes. Soil pipes which convey water from WCs will be 100 mm and waste pipe as per recommendation of National Public Codes Handbook and the sizes of waste pipes will be 50 mm and 75 mm which convey water from other uses like kitchen sink, wash hand basin. Cleanouts have been suggested at appropriate locations.

For external sewer system upvc Pipes conforming to British Specifications shall be specified. The minimum diameter of pipes to be used shall be 6 inches. A minimum cover over the crown of pipe is 1 meter from the finished grade level. Sand shall be used for pipe bedding.
Pipe joints shall be of push fit type or using rubber rings. Special care shall be taken in the selection and handling of pipes for use with rubber ring joints, to ensure that pipe ends shall be smooth and are laid in a straight line without deflection.

The wastewater pipes (soil, & waste) shall be connected to the external sewer system through manholes. The maximum spacing between manholes shall be such that connection from the building could be made easily. Internal diameter of manhole has been kept as per Specifications given in MRS. Malleable Cast Iron steps shall be used in the manhole.

For effective and efficient disposal of the storm water for the roof of the building, the areas have been divided into subsurface areas. This has been created by providing slope in the roof finish design.

According to the guidelines of National Building Code of U.S.A. 100 mm (4") diameter pipe is enough for the area upto 1880 sq. ft for rainfall upto 4 inch. Keeping in view the limit of area for roof drainage and one 100 mm (4") dia upvc pipe have been proposed at appropriate locations for the area upto 1500 sq.ft.

Septic Tank: Solid and liquid waste coming from toilets and kitchen are collected in manholes and gully traps. These waste materials are then carried to external sewer which ultimately leads to main collection chamber called septic tank. Design of septic tank shall be such that its length is twice its breadth. The inlet and outlet compartment shall be provided with manhole covers which shall be at least 24 inch in diameter. These covers should be water tight and sealed. Invert level of inlet pipe shall be kept at least 3 inch above the outlet pipe.

Electrical Distribution Network: Electric power supply at 11kV level shall be required for provision of electrical services for the subject project. The scheme of development of MV/LV Distribution system design mainly comprises for the power supply arrangement of the following:

i. Ground Floor
ii. First Floor
iii. Second Floor

The power supply at 11kV level and distribution at 400/240V shall be used for the Indoor/ Outdoor electrification.

ELEVATOR SYSTEM DESCRIPTION:

The following Elevator System is being proposed as per EN-81 and Building Code of Pakistan Fire Safety Provisions- 2016;

- Two (02) Passenger elevators of capacity 1000kg (13Persons) shall be installed in the building to cater the requirement of vertical transportation within the building as well as handicaps.
- Speed of Passenger elevators shall be 1m/s because no. of floors is less no need of high speed elevator.
- Elevators design is compliance with European Norms standards EN-81-20, EN-81-50 and EN81-70.
- Keeping in view the ambient temperature i.e. -3°C to -5°C in peak winter season an inverter type air conditioner is being proposed to prevent freezing action.

- Elevator will be directly attached with the fire alarm system and in case of fire elevator will stop accepting calls and move to ground floor, open the doors and shuts off its operation.
- Manufacturer Security Cameras for surveillance is added in the design for monitoring purpose. (If Applicable: Connection with building safety/security is included in Contractor's scope)
- ERD Device (Emergency Rescue Device with battery backup) is considered in the design for safely evacuation of passengers in case of power failure.
- Elevators selected are Machine room less with VVVF motors which are more energy efficient (30% to 50%) as compared to conventional Machine Room Type elevators.

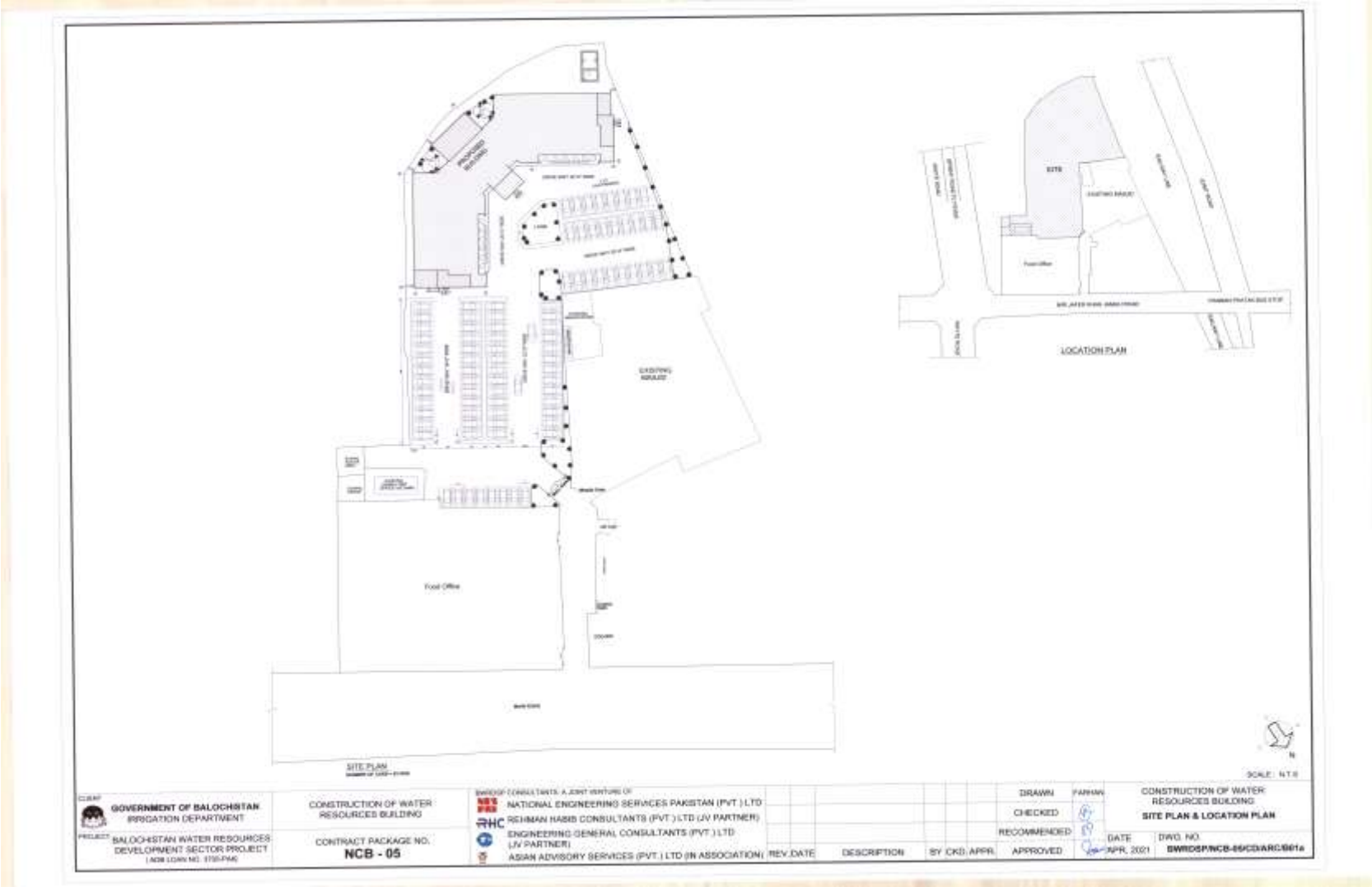


Figure 1: Site Plan & Location Plan

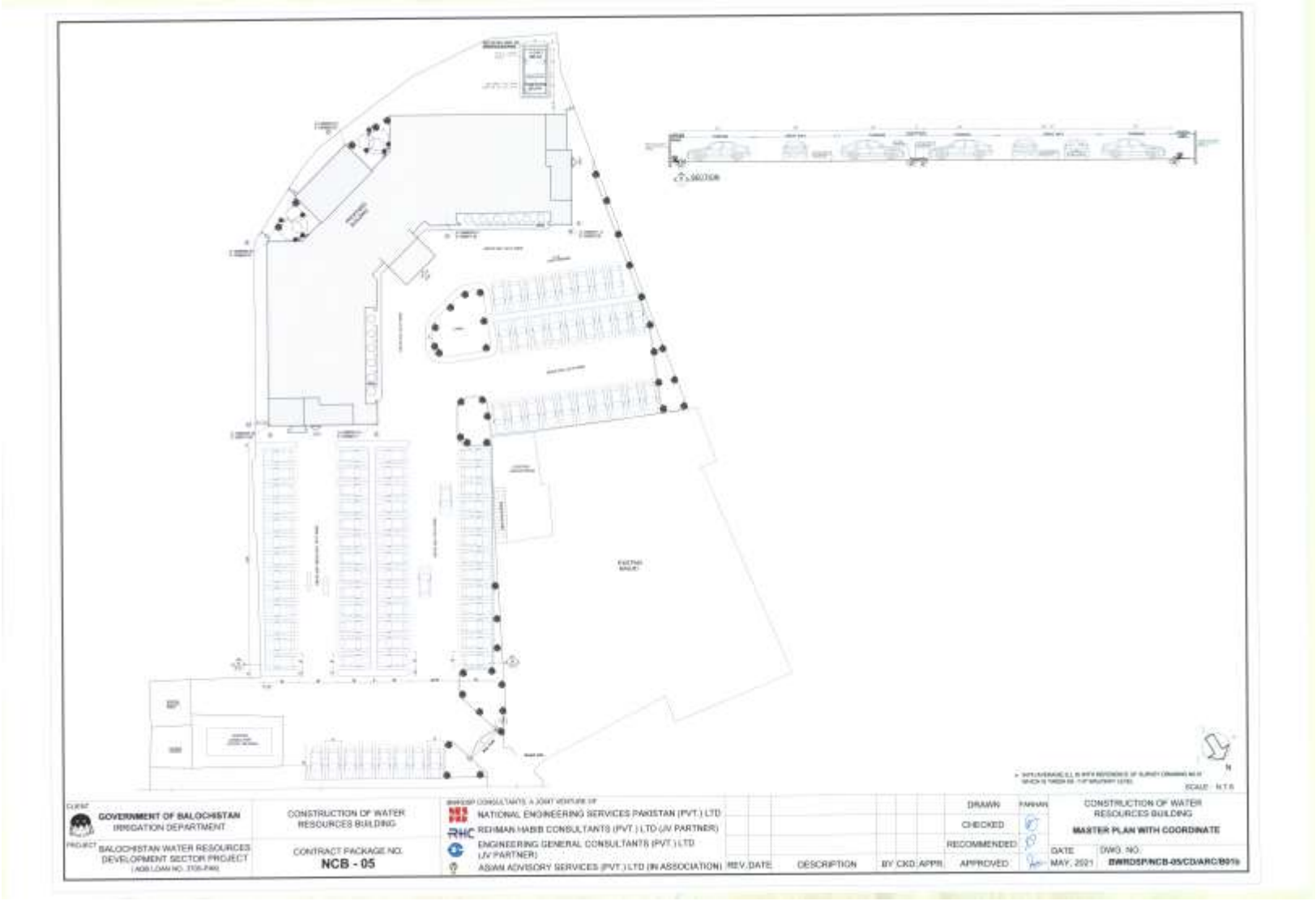


Figure 2: Master Plan with Coordinates

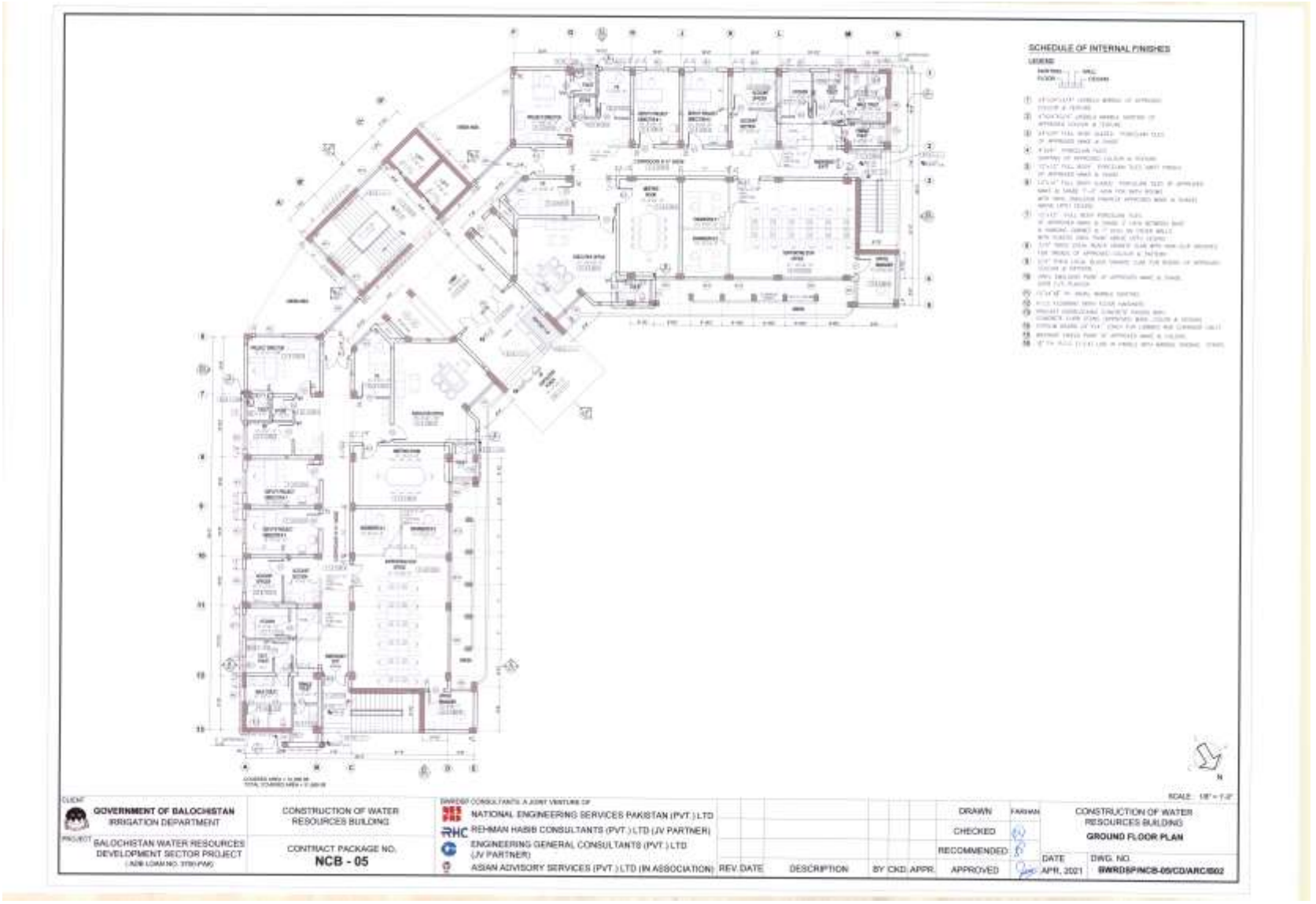


Figure 3: Ground Floor Plan

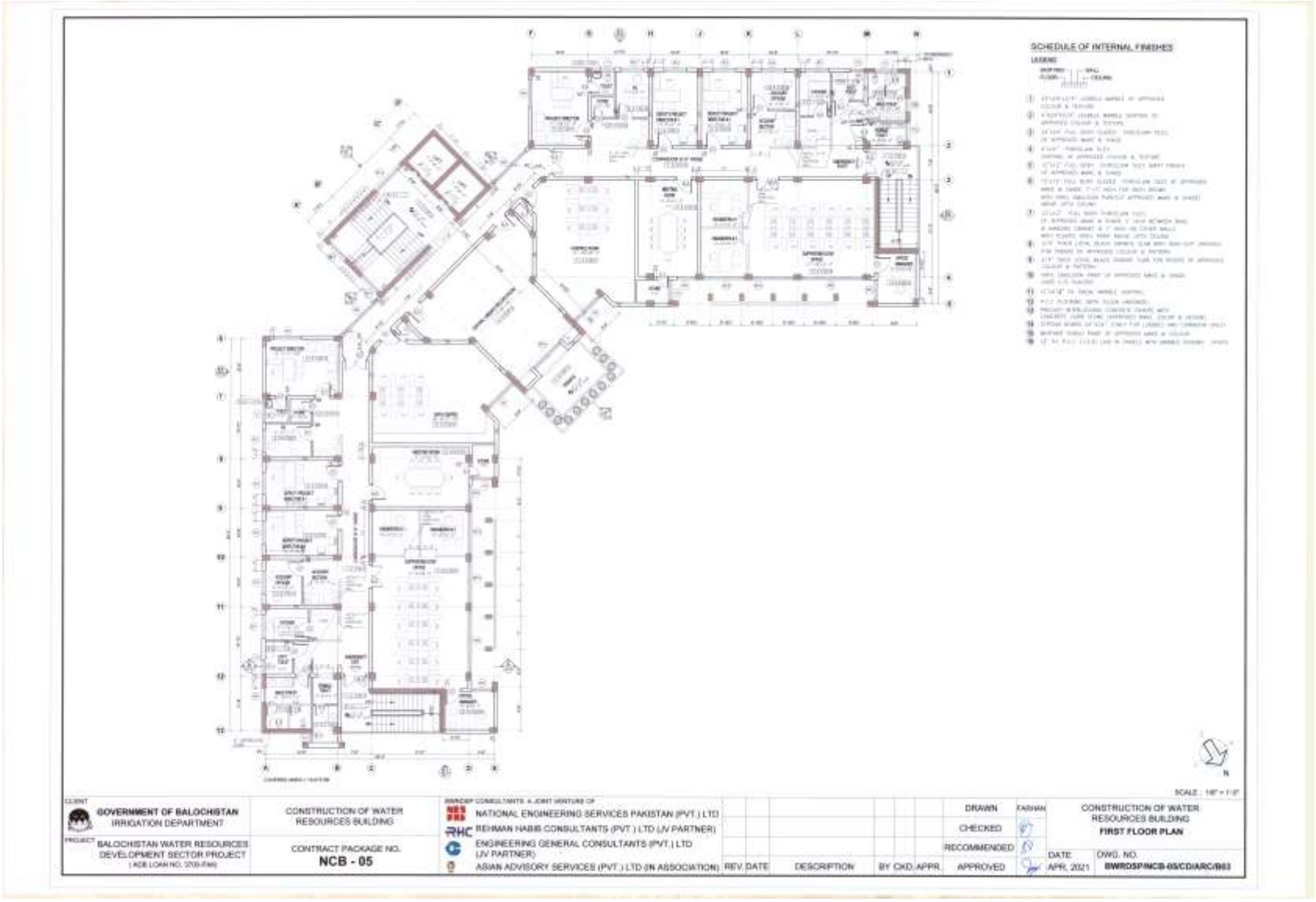


Figure 4: First Floor Plan

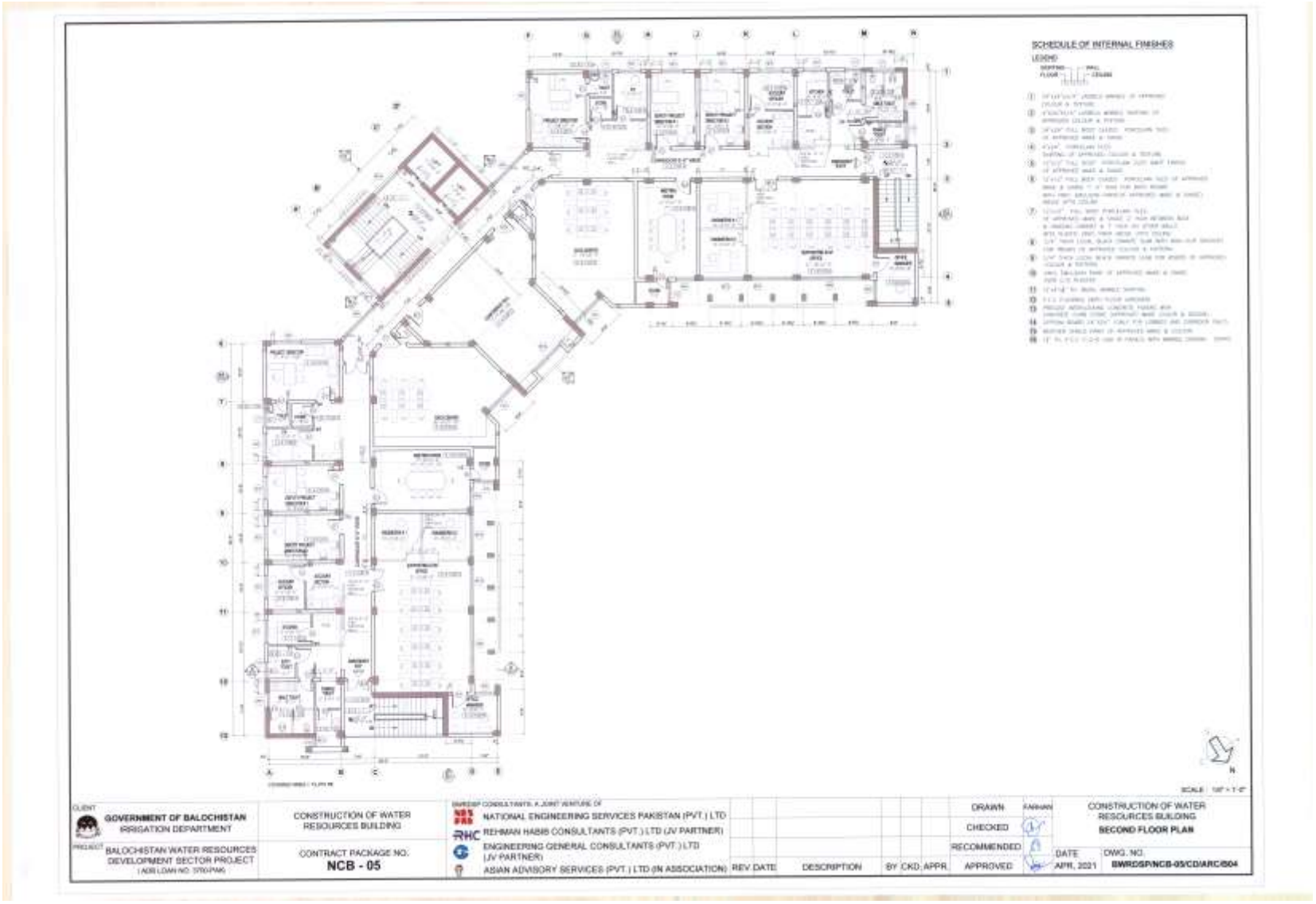


Figure 5: Second Floor Plan

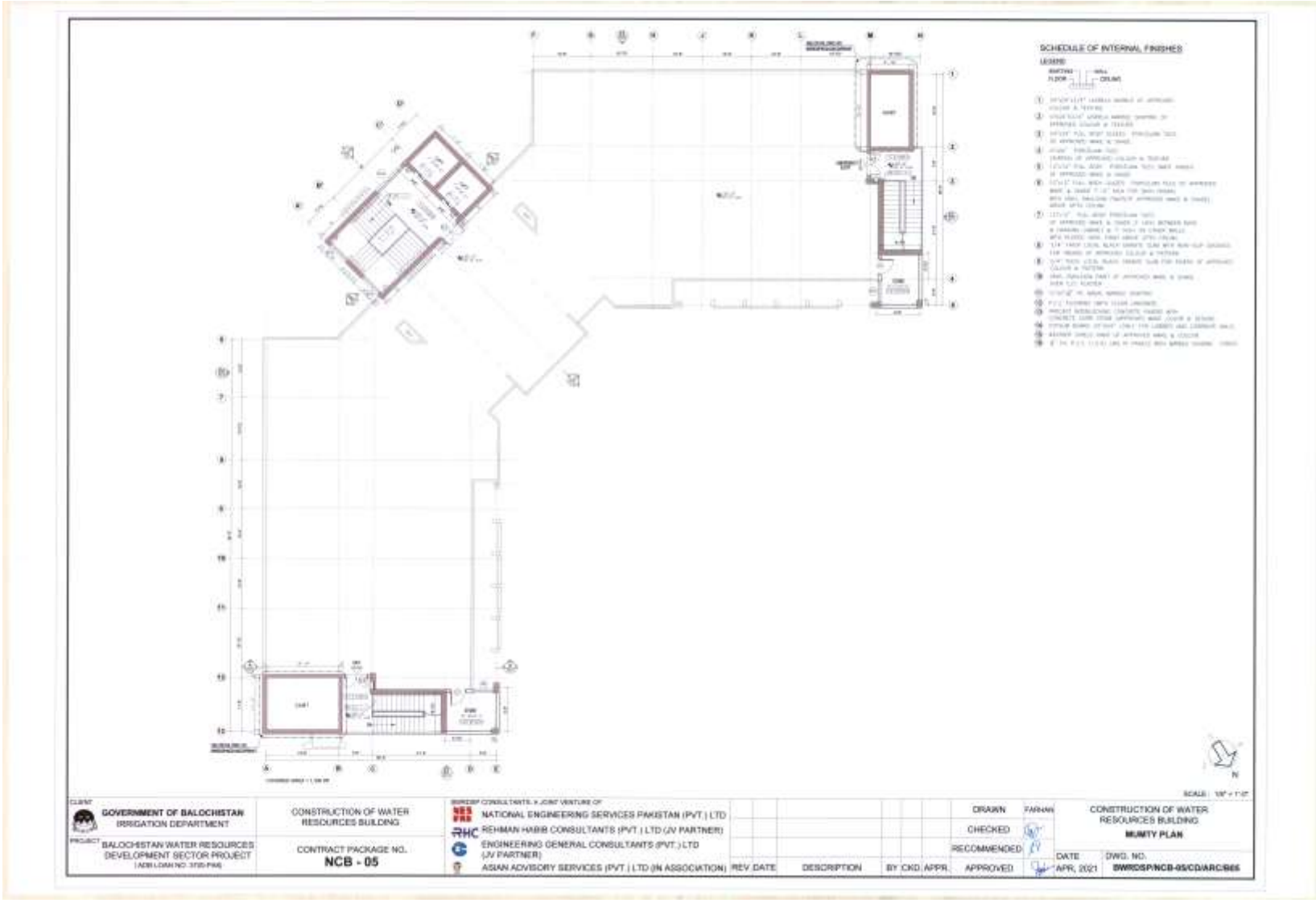


Figure 6: Mumty Plan

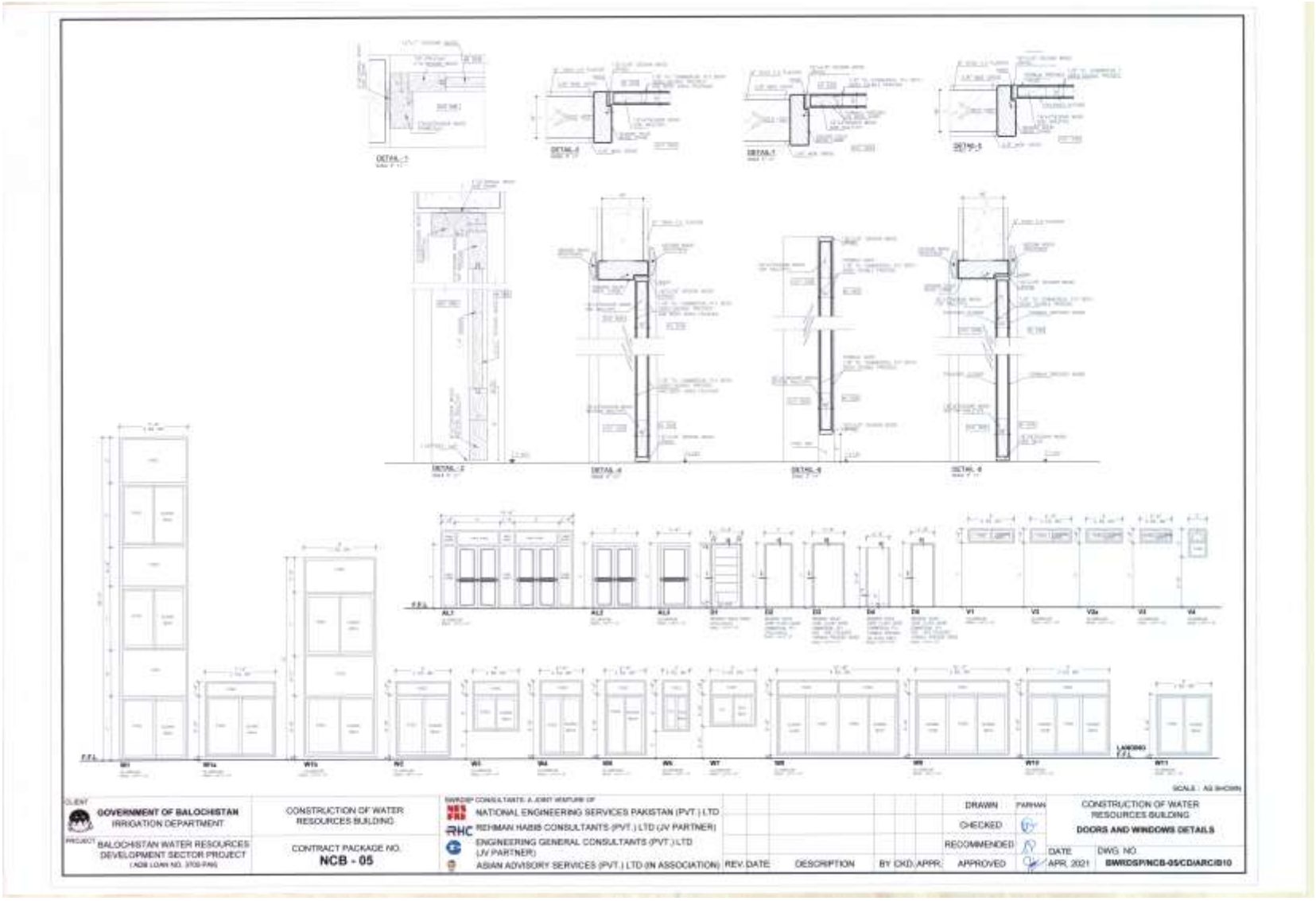


Figure 7: Doors and Windows Detail

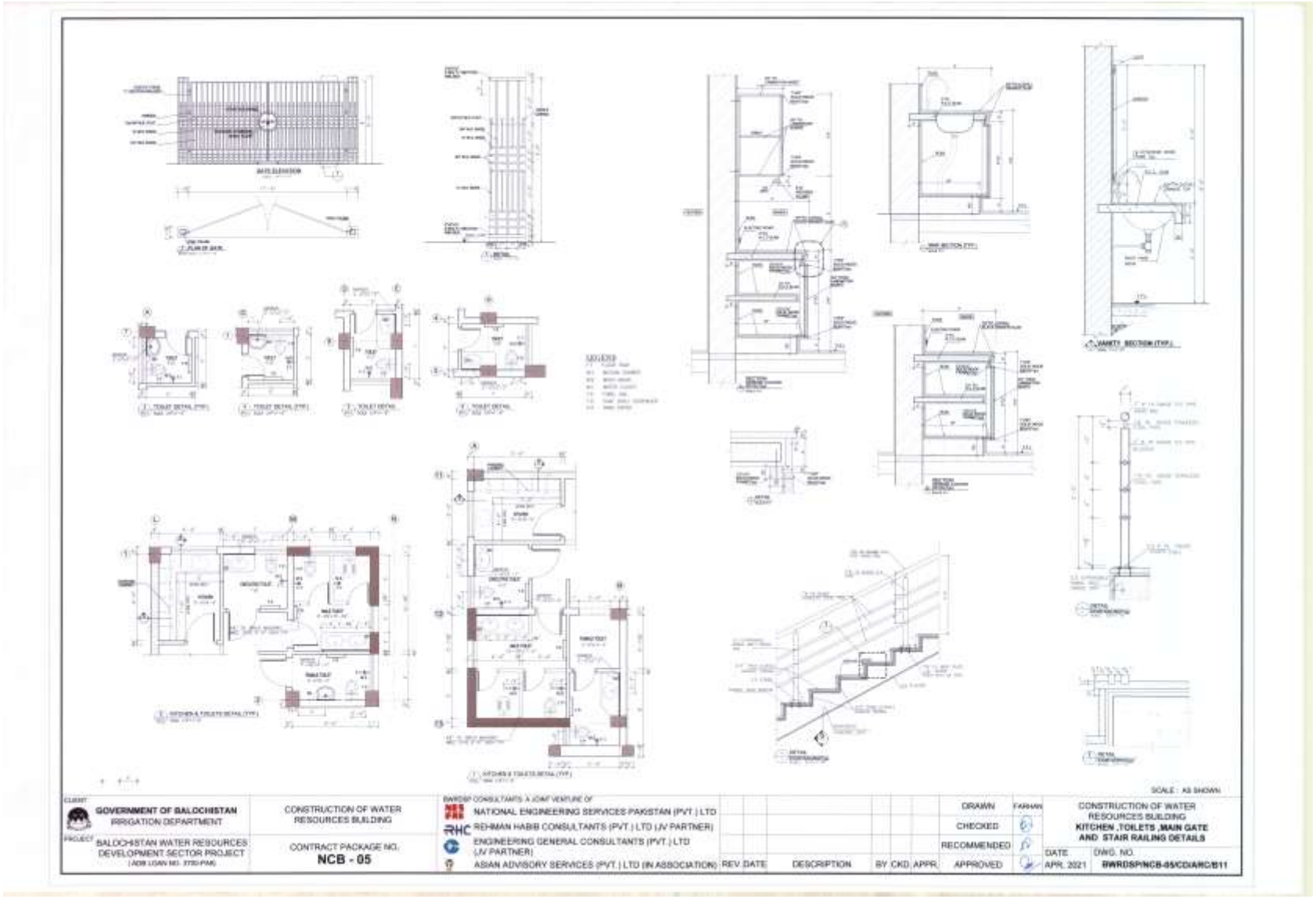


Figure 8: Kitchen, Toilets, Main Gate and Stair Railing Details

CHAPTER -4
ENVIRONMENTAL AND SOCIAL BASELINE

4. ENVIRONMENTAL AND SOCIAL BASELINE

4.1 GENERAL

The purpose of this chapter is to establish the baseline conditions for the physical, biological and the social aspects of environment of the project area. The data and information presented in the description of the environment are collected through comprehensive literature survey, discussions and interview with stakeholders and assessment of the baseline conditions in proposed water resources building project area.

4.2 PHYSICAL ENVIRONMENT

4.2.1 Geography and Soil

Quetta is located in a densely populated portion of the Sulaiman Mountains in the north-east of the province. It is situated in a river valley near the Bolan Pass, which has been used as the route of choice from the coast to Central Asia, entering through Afghanistan's Kandahar region.

The soil of the project area is sparsely covered with the vegetation. The soil of the center of the valley is good, but for the District is mostly barani. The soil of the project area is shallow Loamy Gravelly and rock outcrops of plateaux.

The central part of the Quetta valley is covered by a soil that ranges from sandy loam to silt loam. This type of soil is good for crop production. At the margin of the valley near foothills, the soil consists of sandy loam, mixed with pebbles and rock fragments and is suitable for vegetation.

4.2.2 Geology

The WR Building Quetta project area is located in the Sulaiman range of the lower Indus Basin and comprises of plain to low altitude mountains which increase in altitude towards east. The project area mainly comprised of quaternary deposits of silt, sand, and clays with variable composition, surrounded by rocks ranges from Permian to Mid Jurassic marine to continental sedimentary. The project area is hedged by Shirinab formation overlain by Takatu formation. Massive ridge forming Oolitic limestone is the dominant lithology of the Takatu formation. Shirinab formation exhibits pronounced lateral facies changes for which three members are recognized, namely, Spingwar member comprises of sandstone and shale, Loralai limestone comprises of grey limestone and Anjira member comprises of grey limestone and shale.

4.2.3 Topography

The general characteristics of the area is mountainous. The mountains are intersected by long narrow valleys consisting of flat alluvial plain with heavy pebbly slopes rising on either side. The general elevation of the District is about 1200 to 3500 meters above mean sea level, while the elevation of project area ranges from 1600 to 1700 meters. Figure 4.1 shows the topography of the Quetta .

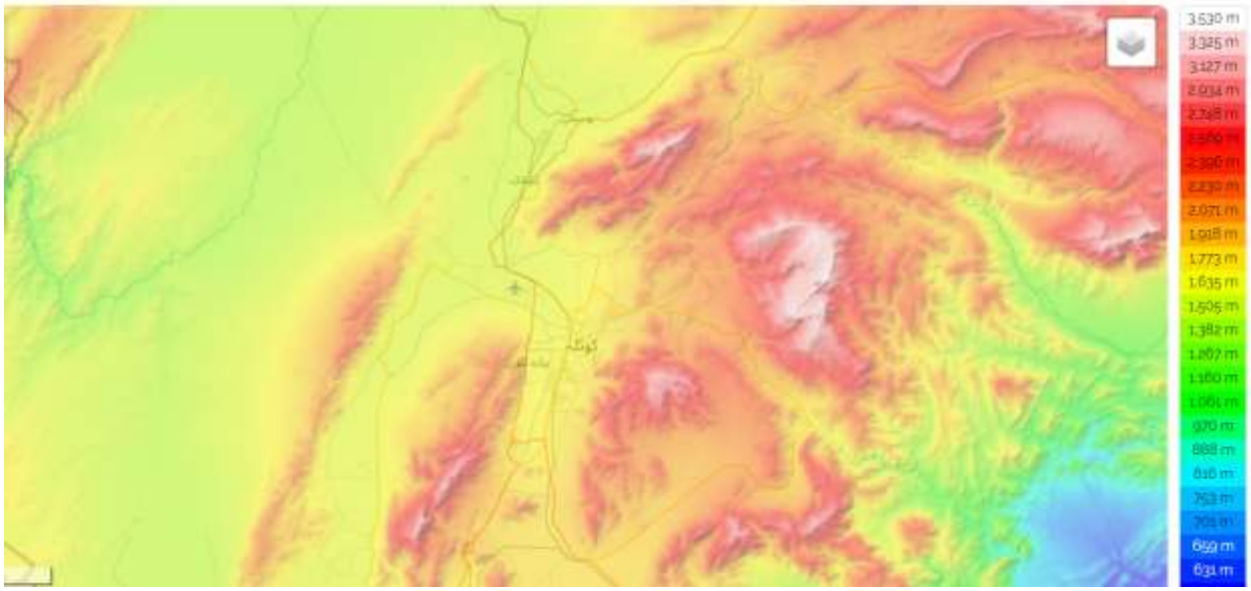


Figure 9: Topography of the Quetta

4.2.4 Seismicity

The project area falls in seismically active zone due to its proximity of two tectonic plates, where plates movement is of transform nature. The region in which the project is located has been subjected to severe shaking in the past due to earthquakes. The historical record mentioned a damaging earthquake, which damaged project area, was 1935 Quetta earthquake with intensity X-XI. The earthquake which devastated Quetta has been one of the most disastrous earthquake in Pakistan. About 30,000 people lost their lives in this earthquake. The cities of Quetta, Kalat and Mastung were completely destroyed. Another earthquake (September 24, 2013, Magnitude 7.7) occurred on south-central Pakistan, 61km NNE of Awaran occurred as the result of strike-slip type motion at shallow crustal depths. The epicenter of the event is 69km north of Awaran, Pakistan, and 340km south of Quetta, Pakistan.

Major active tectonic feature near project area is Chaman Fault passes about 76 km northwest to the project site and have the potential to produce damaging earthquakes. The fault is one of the most significant geodynamic features in Pakistan represents the transform boundary of the Indian Plate. Probabilistic seismic hazard assessment carried out as part of the revision of the Building Code of Pakistan Seismic Provisions (2007) shows that the project area falls in Zone-4 with peak horizontal ground acceleration of 0.34g (ground motion with return period of about 500 years or 10% probability of exceedance in 50 years) for soft rock foundation condition.

It is therefore recommended that the project structures should be designed to cater the requirement of Zone-4B after giving due consideration to the foundation soil material.

4.2.5 Rivers and Streams

The province of Balochistan is a water-starved and land-rich region in Pakistan. Besides streams, other sources are at the risk of over exploitation. Balochistan can be divided into three hydrological regions the Nari Basin, the Kharan closed Basin and the Mekran Coast consisting of 73 small or large rivers and streams constituting the three hydrological basins. Only about 30% of this potential of rivers and streams are utilized through different schemes. The important rivers in Balochistan are Zhob, Nari, Bolan, Pishin, Lora, Mula, Hub, Porali, Hingol, Rakshan and Dasht.

4.2.6 Climate

The province of Balochistan is a water-starved and land-rich region in Pakistan. Besides streams, other sources are at the risk of over exploitation. Balochistan can be divided into three hydrological regions the Nari Basin, the Kharan closed Basin and the Mekran Coast consisting of 73 small or large rivers and streams constituting the three hydrological basins. Only about 30% of this potential of rivers and streams are utilized through different schemes. The important rivers in Balochistan are Zhob, Nari, Bolan, Pishin, Lora, Mula, Hub, Porali, Hingol, Rakshan and Dasht.

Table 4-1: Month wise 30 years Mean Temperature, Precipitation and Relative humidity recorded at Quetta (Samungli) Station

Month	Mean Temperature		Precipitation (mm)	Relative Humidity (%)
	Maximum	Minimum		
January	10.79	-3.36	56.74	65.76
February	12.92	-0.87	48.98	64.85
March	18.68	3.44	55.01	57.30
April	24.84	8.30	28.26	48.45
May	30.42	11.51	5.96	36.82
June	35.25	15.93	1.08	31.43
July	35.90	19.86	12.71	40.53
August	34.84	17.87	12.07	39.97
September	31.36	10.90	0.29	36.28
October	25.46	3.84	3.90	36.27
November	19.18	-0.88	5.27	45.83
December	13.33	-3.18	30.45	59.46
Annual	**24.42**	**6.95**	**260.75**	**46.91**

Source: Normal for the period 1961-90 data processing Centre, Pakistan Meteorological Department Karachi

4.2.7 Natural Hazard Vulnerability

The proposed project site is susceptible to seismic hazard due to its geographical location

a) Seismology

Quetta lies in the active seismic region The worst earthquakes hit the city in May 1935, when a large part of Quetta was destroyed. The project area is located in Seismic Zone-IV, where zone-IV represents seismic factor ground acceleration >0.32g. Figure 4.2 shows the seismic zoning map of Pakistan indicating that project area is falling under Seismic Zone-IV.

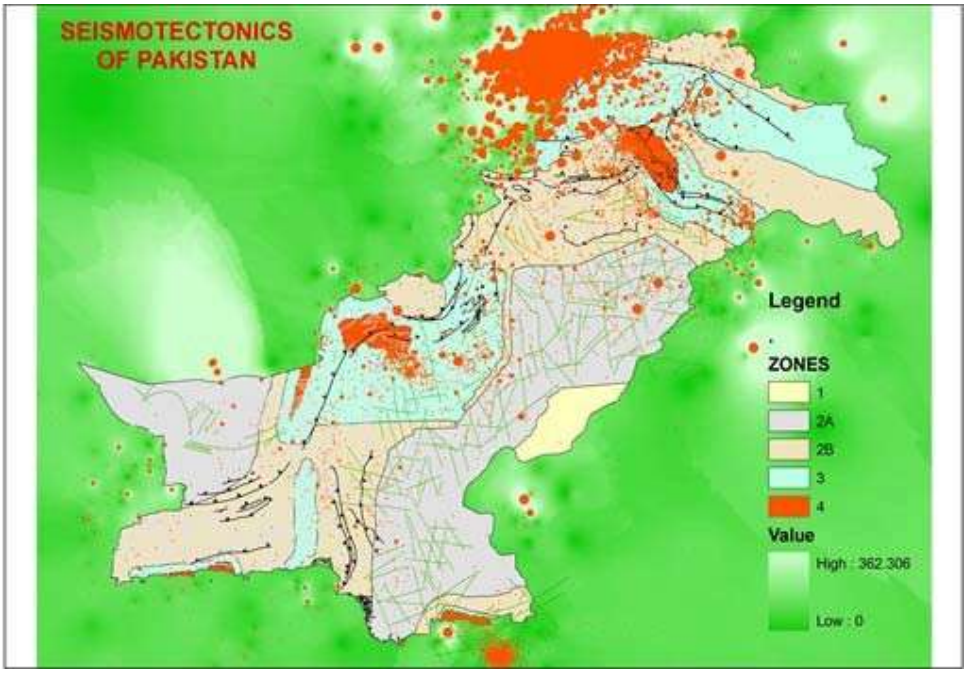


Figure 10: Seismic Zoning Map of Pakistan

b) Floods

Two Union councils of district Quetta are under the threat of flood and settlements on banks of nullah which flows through city. The history has no significant and relentless effects of the flood. However, during 2007 cyclone in coastal areas and rain in other parts of the province was affected badly the district badly and trade links were cut off.

4.2.8 Air Quality

The ambient air quality monitoring in the project area is being carried out and the report will be updated after completion of monitoring. However, previous studies were conducted in August, 2011. The sampling was conducted for 24 hours. The results of laboratory analysis of ambient air quality parameters are given in Table 4.2.

Table 4-2: Ambient Air Quality Analysis (August, 2011)

Sr. No.	Parameters	Obtained Concentration						Duration	NEQS	USEPA Standards
		Soryab Phattak		Malli Bagh		Sabzal Road				
1	Carbon Monoxide (CO)	2.21 ppm	2.48 mg/m^3	0.663 ppm	1.72 mg/m3	0.4419 ppm	1.16 mg/m3	24 Hours	5 mg/m3	35 ppm (1-Hour Average)
2	Sulfur Dioxide(SO2)	0.0237 ppm	60.84 µg/m3	0.0302 ppm	78.38 µg/m3	0.0167 ppm	43.75 µg/m3		120 µg/m3	0.14 ppm (24-Hour)
3	Nitrogen Dioxide (NO2)	0.00087 ppm	2.24 µg/m3	0.00207 ppm	5.38 µg/m3	0.00075 ppm	1.96 µg/m3		80 µg/m3	0.053 ppm (Annual Arithmetic Mean)
4	Particulate Matter (PM10)	-	65.97 µg/m3	-	47.60 µg/m3	-	34.54 µg/m3		250 µg/m3	150 µg/m3 (24 Hours Average)

Source: SGS Lab Test Result, 2011

The values of CO, SO2, NO2 and PM10 were within permissible limits of USEPA and NEQS. However, due to increase in the traffic with the passage of time, it is estimated that average values of CO, SO2, NO2 and PM10 would have been increased.

4.2.9 Groundwater

Groundwater is the main source of water in project area which is being used for domestic purpose as well as for irrigation of agriculture land. The depth to water table varies between the range of 900-1000 ft. At present, the source of recharge to groundwater is only rainfall, which is about 1 inches per year. The groundwater quality monitoring in the project area is being carried out and the report will be updated after completion of monitoring. However, previous studies were conducted in August, 2011. The groundwater samples were analyzed for chemical and microbiological parameters. Table 4.3 shows groundwater analysis.

Table 4-3: Groundwater Analysis

Sr. No.	Parameters	Unit	Test Results			WHO Guidelines	NEQS
			Malli Bagh Tubewell	Killi Kabir Tubewell (Shahbaz Town)	Filter Plant Outlet, Satellite Town		
A. Chemical Parameters							
1	pH	-	7.73	7.79	8.13	6.5-8.5	6.5-8.5
2	Total Dissolved Solids (TDS)	mg/l	318	532	298	1000	1000
3	Total Hardness as $CaCO_3$	mg/l	163.14	211.94	173.13	500	500
4	Chloride	mg/l	43.23	97.03	45.87	250	250
5	Nitrates	mg/l	2.25	4.34	5.19	50	50
6	Fluoride	mg/l	0.93	0.84	0.76	1.5	1.5
7	Sodium	mg/l	24	59	22	200	-
8	Arsenic (As)	mg/l	0.05	0.05	0.05	0.01	≤0.05
9	Iron	mg/l	0.325	0.037	0.1	0.3	-
10	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	0.01	≤0.05
11	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	≤0.001
B. Microbiological Parameters							
1	Total Colony Count	Cfu/ml	180	4032	450	<500 Cfu/ml	0/100 ml
2	Total Coliforms	Cfu/100ml	16	25	TNTC	0/100 ml	0/100 ml
3	Fecal Coliforms (E.Coli.)	Cfu/100ml	Absent	Absent	Absent	0/100 ml	0/100 ml

Source: SGS Lab Test Result, 2011

The groundwater analysis results reveal that water is contaminated with total coliforms.

4.2.10 Waste Water

The wastewater has been extensively used for irrigation of crops in project area. The wastewater quality monitoring in the project area is being carried out and the report will be updated after completion of monitoring. However, previous studies were conducted in August, 2011. Table 4.4 shows wastewater analysis.

Table 4-4: Wastewater Analysis

Sr. No.	Parameters	Unit	Test Results			NEQS
			Sabzal Road Treatment Plant	Sumangli Road STP Inlet	Balochistan University STP Inlet	
1	Temperature (during sample collection)	^oC	25	29	25	≤30
2	pH	-	7.40	7.25	7.56	6 – 9
3	Total Dissolved Solids (TDS)	mg/l	1266	916	966	3500
4	Total Suspended Solids (TSS)	mg/l	124	88	21	200
5	Chemical Oxygen Demand (COD)	mg/l	474	330	298	150
6	Biochemical Oxygen Demand (BOD_5)	mg/l	214	153	140	80
7	Oil & grease	mg/l	20.0	8.0	27.5	10
8	Chloride (Cl)	mg/l	215.23	129.67	141.13	1000
9	Sulfate (SO_4)	mg/l	112.39	12.76	44.85	600
10	Sulfide (S)	mg/l	20.74	17.02	21.91	1.0
11	Fluoride (F)	mg/l	1.02	0.09	1.40	10
12	Ammonia (NH_3)	mg/l	5.13	4.87	4.58	40
13	Cyanide (CN)	mg/l	<0.01	<0.01	<0.01	1.0
14	Phenolic Compounds	mg/l	0.02	0.017	0.022	0.1
15	Anionic Detergents	mg/l	2.12	1.99	2.08	20
16	Arsenic (As)	mg/l	0.10	0.08	0.10	1.0
17	Barium (Ba)	mg/l	<0.5	<0.5	<0.5	1.5
18	Boron (B)	mg/l	0.199	0.129	0.214	6.0
19	Chromium (Cr)	mg/l	<0.02	<0.02	<0.02	1.0
20	Cadmium (Cd)	mg/l	<0.03	<0.03	<0.03	0.1
21	Copper (Cu)	mg/l	0.025	<0.02	<0.02	1.0
22	Iron (Fe)	mg/l	1.4	1.8	0.68	8.0
23	Lead (Pb)	mg/l	0.025	0.025	0.025	0.5
24	Manganese (Mn)	mg/l	0.075	0.1	<0.05	1.5
25	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.01
26	Nickel (Ni)	mg/l	0.05	0.025	0.062	1.0
27	Selenium (Se)	mg/l	0.041	0.02	0.006	0.5
28	Silver (Ag)	mg/l	<1.0	<1.0	<1.0	1.0
29	Zinc (Zn)	mg/l	0.2	0.325	0.087	5.0
30	Total Toxic Metals	mg/l	0.640	0.279	0.407	2.0
31	Chlorine (Residual)	mg/l	<1.0	<1.0	<1.0	1.0

Source: SGS Lab Test Result, 2011

All the tabulated parameters of wastewater were within prescribed limits of NEQS except BOD5, COD, Oil & Grease and Sulfide.

4.2.11 Noise

Noise monitoring in the project area is being carried out and the report will be updated after completion of monitoring. However, previous studies were conducted in August, 2011. Noise level was monitored with the help of a potable digital sound meter in 2011. Table 4.5 indicates that noise levels monitored in Project area during day time and night time were within prescribe limits of NEQS.

Table 4-5: Average Noise Level Monitoring

Sr. No.	Location	Test Results L_{eq}		Unit	NEQS (Commercial)	
		Day Time Average	Night Time Average		Day Time	Night Time
1	Soryab Phattak	60.37	58.46	dB (A)	65	5
2	Malli Bagh	58.85	50.63			
3	Sabzal Road	43.97	40.37			

Source: SGS Lab Test Result, 2011

4.2.12 Land use

The land use of the proposed project area is predominantly commercial and residential including health & religious facilities, and mosques.

4.2.13 Environmental Sensitive Receptors

Some important environmentally sensitive receptors have been identified during site visits. These sensitive receptors and their respective sensitivity are listed in the Table 4.6.

Table 4-6: Environmental Sensitive Receptors and their Sensitivity

Sr. #	Sensitive Receptors	Remarks
Educational Institutes		
1	Irrigation Office	Sensitivity due to noise and dust exposure during teaching hours and access problems for the staff during construction phase.
2	Project Director 100 Dams Project Office	
3	Food Department Office	
Mosques/Shrines/Graveyards		
8	Jamia Masjid Abdul AzizAkbar	Sensitive to noise and dust pollution during construction phase and inconvenience for the Namazis.

4.3 ECOLOGICAL ENVIRONMENT

4.3.1 Flora

The soil of the district is sparsely covered with vegetation. A variety of species of flora are found in the hills and their surroundings. Artemisia maritimia is the most prevalent species followed by cymbopogan, chpysopogoneri, nepata juncea and astragalus stocksic. Artemisia is used for medicine purpose. Camelarom, Juniper and pistachio trees are used for fuel purpose. Other vegetation found in the district, are humma (ephedra intermedia), ghurezah (Sophora alopecuroides), khakshir (sisymbium Sophia), kharorak (arnebia cornuta), lokhae (Scirpus wardianus), makhi (caragana ambigua) etc.

4.3.2 Fauna

The common wild beasts are the hyena, wolf, fox, and jackal. Zarghun and Takatu mountains contain sheep and markhor. Leopard is occasionally seen in the Zarghun and Chiltan hills. The most common game birds are Chikor and Sisi.

4.4 SOCIOECONOMIC CONDITIONS

4.4.1 Population Size, Growth and Distribution

i) Population Size and Growth

The population of Quetta District according to census 2017 is 22,756,99 which was 773, 936 in 1998 as compared to 381,570 in 1981 recording an increase of 99.16 percent over the last 17 years i.e. 1981-98. The increase of 51.19 and 77.64 percent was observed during Intercensal period 1972-81 (8.46 years) and 1961-72 (11.67 years) respectively. Overall the population of the district has increase quite rapidly showing substantial increase of 434.91 percent during the last 37 years i.e. 1961-98 which is more than five times. The average annual growth rate of population in the district is 5.83 during the intercensal period 1998-2017 which was 4.13 percent. during Intercensal period 1981-98 as against 5.01 percent during 1972-81 and 5.05 percent in 1961-72.

Table 4-7:Population of different intercensal period.

Description	1961	1972	1981	1998	2017
Population(thousand)	142070	252380	381570	773936	2275699
Intercensal increase %	--	77.64	51.19	99.16	--
Cumulative increase %	--	77.64	168.58	434.91	--
Average annual growth rate %	--	5.05	5.01	4.13	5.83

The total area of the district is 2653 square kilometers according to census report 2017 the population density of district is 857.78 persons per square kilometers, which was 286.04 persons per square kilometers according to census report 1998.

ii) Household Size

According to census report 2017 the Average household size for the district is 8.22 persons, which was 8.5 persons in 1998. The household size varies at 8.61 and 7.78 for rural and urban areas respectively.

iii) Rural/ Urban Distribution

The rural population of the district is 1274494 constituting 56 percent of the total population. The average annual growth rate of rural population is 9.96, which was 4.26 percent during 1981-98 and was 0.19 and 8.75 percent during 1972-81 and 1961-72 respectively. The urban population of the district is 1001205 constituting 44 percent of the total population. The average annual growth rate of urban population according to census report 2017 is 3.05 percent, which was 4.09 percent during 1981-98 and was 7.25 and 3.43 percent during 1972-81 and 1961-72 respectively.

iv) Sex Ratio

Sex ratio is an important demographic indicator which is defined as the “number of males per hundred females”. According to the census report 2017 the sex ratio of the district is 110.37, which was in 1998 118.45 for the district. The sex ratio in rural and urban areas of the district is 108.91 and 112.26 respectively which indicates that the male proportion is higher in the urban areas as compared to the rural areas.

v) Religion

The population of the district is almost Muslim. They constitute 96.41 percent of the total population with a breakup of 98.52 percent in rural and 95.68 percent in urban areas. There are few Christian, Hindu, scheduled caste and other communities which are 3.59 percent of the total population.

vi) Mother Tongue

The mother tongue refers to the language used for communication between parents and their children in the household. The question was asked about all individuals living in the housing unit.

The predominant mother tongues of population of the district are Pashto and Bullochi, spoken by 57.54 percent of the total population followed by others at 17.46 percent and Punjabi at 16.01 percent. The proportion of the population speaking Pashto and Bulloch is significantly higher in rural areas at 84.23 percent as compared to the urban areas at 48.34 percent. In contrast the proportion of others and Punjabi is higher in urban areas at 40.68 percent as against rural areas at 12.58 percent. The proportion of the population speaking Urdu, Sindhi and Saraiki is 8.99 percent.

Table 4-8: Language spoken in the district.

Area	Urdu	Punjabi	Sidhi	Pashto	Balochi	Saraiki	Others
All areas	5.96	16.01	1.44	29.97	27.57	1.59	17.46
Rural	1.41	4.42	0.37	48.16	36.07	1.42	8.16
Urban	7.53	20.01	1.80	23.70	24.64	1.65	20.67

vii) Migration

Migration data covers movement of population from one district to another in the same province and from one province to another. It does not cover persons who changed their place of residence within their own district.

viii) Economically Active population

The economically active population of the Quetta district among the population aged 10 years and above to the total population is 23.35 percent which is 177.45 thousand souls with 96.33 percent male and 3.67 percent female. The remaining 76.65 percent economically inactive population consists of 29.16 percent children below 10 years, 30.32 percent domestic workers including 65.35 percent female amongst the total females and 0.74 percent male workers amongst the total males. In which12.66 percent are students, while all other categories constitute 4.51 percent in the total economically inactive population of the district.

The labor force participation rate as percentage of total labor force to the population aged 10 years and above is computed at 32.96 percent for the district. There is a significant difference in the participation rates between male and female labor forces as 57.59 percent for male compared to 2.70 percent for female. The labor force participation rate is slightly higher i.e. 33, 00 percent in urban area as compared to 32.84 percent in the rural area.

4.4.2 Administrative Set up

i) Executive, Judiciary and Revenue System

The district is headed by a Deputy Commissioner on the executive side aided by the Additional Deputy Commissioner and the two Sub-Divisional officers who are in charge of the city and Saddar sub-divisions. At the tehsil level, in Quetta there is a full-fledged tehsil which is headed by a Tehsildar assisted by one Naib Tehsildar and the usual subordinate revenue staff. However, there is nowadays a Naib Tehsildar, whereas in ancient times there used to be only a Kanungo to look after the revenue work and was assisted by patwari and the Levies staff.

Besides, there are Extra Assistant Commissioners at Quetta who are also first-class Magistrates. Consequent upon the long-standing principle of separating the executive from judiciary, there have been since been appointed Judicial magistrates as well at Quetta.

However, to maintain law and order Quetta district is divided into two Sub-divisions, Quetta city and Quetta Saddar and sub-tehsils is Quetta tehsil and Panjpai.

ii) Health

The number of healthcare facilities, their service level, and the area-coverage in Quetta is reasonable and satisfactory. There is fair number of large size general and specialized hospitals that provide round-the-clock medical care services. In addition to the provincial Civil Hospital of the British days, following additional health facilities in the public sector are available in Quetta city.

- Sardar Bahadur Khan T.B Sanatorium
- Railway Hospital
- Combined Military Hospital (C.M.H)
- Helpers Eye Hospital
- Christian Hospital
- Lady Duffer in Hospital for women
- Children Hospital Quetta (C.H.Q)

During recent years a number of private clinics and hospitals have sprung up in the city. Prominent among them are the following

- Al-Rehman Hospital
- Saleem Hospital
- General Hospital
- Jilani Hospital
- Tariq Hospital
- Alfahad hospital
- Al-Noor hospital
- Universal Medical Complex

The position of health services available in the district is as under in the Table 4.9

Table 4-9: Health Care Profile of District Quetta

Sr.	Facility	No. of Doctors	No. of Nurses	No. of Paramed	No. of Beds	No. of
1.	Hospital	509/238	26/580	336/2	1988	6
2.	RHC				30	3
3.	BHU					34
4.	CD	54/41		213/71		9
5.	MCH					13
6.	TB					1
7.	Other					1
8.	Total	842+327=1169	606	622	2018	67
9.	Unit/Population Ratio	1057	2038	1986	612	18434

(Source: Balochistan Development Statistics, 2018)

iii) Education

Besides the university of Baluchistan, two private sector institutions namely juniper and Princeton universities are catering to the higher studies need of the students of the province.

Additionally, two professional colleges that is Bolan Medical College and Agriculture College are functioning under the aegis of the University of Baluchistan.

Moreover, the following colleges are also available in the city.

- Two-degree colleges one each boy for boys and girls
- Five intermediate colleges two for boys and three for girls
- Two intermediate colleges co-educational being run under the aegis of the Federal Board of Education
- Three colleges in the PTV sector, one co-educational and one each for boys and girls.

The education statistics of the district are as under in the Table 4.11

Table 4-10: Educational Profile of District district

Community	Primary	Middle Schools	High Schools	Colleges
6	445 (310+135)	96 (44+52)	96 (41+55)	19 (7+12)

(Source: Balochistan Development Statistics, 2018)

4.4.3 Industry and Trade

i) Industry

In all there are thirty-five industrial establishments at Quetta. Pharmaceutical manufacturing, fruit preservation and coal mining are the main industrial activities. The Bolan textile mill (presently not functioning) at Baleli and Chiltan ghee mills at Quetta are the main industrial units. The development of cottage or small-scale industries especially in Quetta city is now taking shape. The embroidery industry is developing and its products are supplied to various parts of the country and exported aboard.

ii) Communication

The railway traverses the district from Sariab through Quetta to kuchlak and the principal roads are those running from Quetta to Chaman: to Sibi via Bolan Pass; to Mastung through Lak pass onward to Karachi on RCD Highway.

Quetta is linked with all the districts of Baluchistan through a well-developed network of roads. It is also directly linked with the other provinces through roads. Quetta occupies a central and strategic position. It is seen as the gateway to Central Asia. Quetta is also connected to the rest of the country and to Iran and Afghan borders by rail. The railway was introduced by the British.

Radio and television stations are functioning in Quetta. The first radio station was established in Baluchistan in 1956 at Quetta. The Program of PTV World and STN can also be clearly watched at Quetta. There is also a very good network of telecommunication in the district. Digitalized telephone exchanges have been installed in the district.

There are 34 post offices in Quetta district. The Pakistan post office Quetta is additionally providing the following services: e.g. Fax Money order, Fax Messages, Urgent Mail Service, and Air Express Service. There are also a number of courier services available in the district.

In Quetta there are seven grid stations and one power house. More than 99 percent of the population has been provided with electric connections. Piped natural gas for domestic and industrial use is also available in the district.

iii) Trade and Trade Centers

A Chamber of commerce and trade is functioning at Quetta. There is also a market committee. The federal government has an office of the controller of imports and exports to look after the issue arising from border and facilitate local traders.

iv) Forestry

Small scale natural forests are found in Quetta and at Urak such as Karkhasa, Takatu south and Hazargunji. While those in Urak area are Spin Karez, tagha Tarkhar and zarghun central. Total estimated area under forests comprises 34,634 hectares. There is no private commercial forestry in the district.

4.4.4 Socio Economic Environment

I. Agriculture

The soil of the center of the valley is good, but the district is mostly barani. However, with the coming of grid electricity the tube wells have replaced the old karez system and mechanization of farming has been introduced.

There are two cropping seasons in Quetta district, kharif and rabbi. Kharif crops are sown in summer and harvested in late summer or early winter, while rabbi crops are sown in winter or early winter and harvested accordingly. The important rabbi crops are wheat, barley, cumin, vegetables and fodder. The crops grown during kharif are vegetables, potato, melon, fodder, onion etc.

II. Irrigation

The major sources of irrigation during the last quarter of the 19th century were karezes. The construction of karezes and its maintenance was an expensive affair.

Now a day's tube well becomes the major source of irrigation. Following irrigation schemes have been initiated in Quetta district.

- Flood irrigation
- Perennial Irrigation schemes
- Small delay action dams and flood protection work

III. Forestry

Small scale natural forests are found in Quetta and at Urak such as Karkhasa, Takatu south and Hazargunji. While those in Urak area are Spin Karez, tagha Tarkhar and zarghun central. Total estimated area under forests comprises 34,634 hectares. There is no private commercial forestry in the district.

IV. Horticulture

Hanna and Urak valleys are well known for their extensive orchards of apple, peach, apricot, almond and plum. These are all cash crops. Average production and yield of major fruits grown in the Quetta district during the year 1997-98 is shown in the table 4.13.

Table 4-11: Average, Production and yield of Major fruits grown in Quetta District

Sr. #	Fruit	Total Area (Hectares)	Production (Tones)	Yield per Hectare (Kilograms)
1	Almond	98	404	4124
2	Apple	3025	44553	15149
3	Apricot	564	10215	18438

4	Grapes	851	9320	11135
5	Peach	510	7022	14158
6	plum	541	9173	17573
7	pear	38	400	10526
8	Pomegranate	2	40	20000
9	Cherry	216	1014	5172
10	Pistachio	16	16	2000
11	Other Fruits	5	5	1000

V. Live stock

A minor but a sizeable proportion of the rural population is engaged in livestock rearing activities. In Urban areas, dairy farms are maintained for commercial purpose. There is a network of veterinary institutions which include hospitals, dispensaries, artificial insemination center (A.I.C) and Disease Investigation Laboratory (D.I.L). Livestock population of Quetta district according to the livestock Census, 1996 in Table 4.14.

Table 4-12: Livestock Resources of District Quetta

Sr.	Livestock	1986	1996	2006
1.	Sheep	90	67	164
2.	Goat	47	40	120
3.	Cattle	6	10	11
4.	Buffalo	N.A	5	26
5.	Camel	2	2	1
6.	Poultry	279	100	128

(Source: Balochistan Development Statistics, 2018)

4.4.5 Important/ Historical places of Quetta City

Following are the land marks and important sites of Quetta city.

(i) Hazarganji Chiltan National park

In the Hazargunji Chiltan Park, 20 kilometers south–west of Quetta, markhors have been given protection. The park is spread over 32.500 acres' altitude ranging from 2021 to 3264 meters.

Hazargunji literally means "A thousand treasures" Legend has it, that there are a thousand treasures buried, in the fold of these mountainous which relate to the passage of great armies down the corridors of history. The Bactrian's, Scythians, Mongols and then the great migrating hordes of Baloch, all passed this way.

(ii) Karkhasa

Karkhasa is a recreation park situated at a distance of 10 kilometers to the west of Quetta. It is a 16 kilometers long narrow valley having a variety of flora like ephedra, Artemisia and Sephora. One can see birds like partridge and other wild birds in the park. Limited recreational facilities are provided to the visitors through the forest department.

(iii) Urak Valley

The Urak valley is 21 kilometers from Quetta city. The road is lined on either side with wild roses and fruit orchards. Peach, Plum, apricot and apple of many varieties are grown in this valley.

The water falls at the end of the Urak valley, which is full of apple and apricot orchards, makes for an interesting picnic spot.

(iv) Hanna Lake

A little short of the place where the Urak valley begins and 10 kilometers from Quetta is the Hanna Lake, where benches and pavilions on terraces have been provided. Gold fish in the lake comes swimming right up to the edge of the lake. A little distance away, the waters of the lake take on a greenish blue tint. All along the edge of the lake plantation of pine trees have been made. Chair lift has recently along the lake for the attraction of visitors.

The greenish- blue water of the lake provides a rich contrast to the sandy brown hills that sound it. One can promenade on the terraces.

(v) Askari Park

Askari Park at the airport road offers amusement and recreational facilities.

4.4.6 Culture, Religion, Customs and Specialties

The population of the wider area around the site consists predominantly of Muslims. However, there is reasonable number of Christians residing at the surrounding areas. Balochi and Pashto are the native languages and spoken widely in the province. However, Urdu is gaining popularity and is becoming the lingua franca, particularly amongst the youngsters. People generally respect chadar and chardewari, i.e. they do not mingle up with women publically and stay away from others houses and respectfully wait to be called in or the residents to come out from their houses. A reasonable proportion of womenfolk observe the purdah etiquette, i.e. they remain secluded from outsiders. However, womenfolk do participate in almost all sort of social, cultural, economic, educational, and service activities.

Although Joint family system was noticed in number of households in the surrounding areas, yet the nucleus or small family is fast emerging as the preferred mode because of socio economic compulsions and attitudinal shifts in the youth. In urban areas, nuclear family system is preferred to a joint family system. Due to limited income, people in urban areas prefer to live independently, whereas in rural areas, the majority of people live in joint families. The eldest male member takes care of all the family members. His decision is final in family affairs. On the other hand, nuclear families are very rare in rural areas. The trend for nuclear family is rising in urban areas. Family institution is very important, as it provides social security during un-employment and financial crisis. It also plays an important role in social interaction and conflicts.

The food eaten consists principally of wheat as staple food and meat as main meal. However, bajra, rice, butter and milk etc. are also commonly used. Muhajir and Punjabi groups have different dietary habits. Well-to-do families eat meat and fish frequently. Mostly, people take meals twice a day. Fruit, sweets and confectionaries are becoming frequent in eating habits in the area. Famous regional foods include Sajji roast and Kabli pulao.

Quetta is a multi-cultural area, where a variety of cultural and modern dresses can be observed. The traditional dress consists of a qameez, shalwar with turban in rural areas; coat and a pair of trousers are also worn but in urban areas and that too by few people. Jinnah, Pashtoon and Balochi caps are also used. The dress of women differs from that of men. The traditional dress includes long chadar, loose trousers, but the shirt is much longer and has silk embroidery. Women also wear silver ornaments. Modern dresses worn in urban areas consists of shalwar, qameez without chaddar. The Afghani and Balochi style embroideries on women's dresses are distinct cultural identities.

As the society is predominantly patriarchal, decision-making is in the hands of men and the decisions are binding upon the women. In Rural areas, women have no say in the decision-making process while in some urban families they are allowed to give their opinion to a limited extent. Society is structured on kinship bases and each group is attached to a particular

tradition, founded on different rules of social organization. Most of these rules and traditions have undergone a considerable transformation over time. The political organization is built upon two principles: hereditary authority and personal bonds of allegiance, in which protection is exchanged for loyalty. Many elected representatives are tribal chiefs and sardars.

Quetta experiences different ethnic socio-cultures. Among the Brahvis, the element of central authority exists. The hierarchical system of authority is vertical, with downward flow from the Sardar (head of tribe) to Takkari (head of sub clan) following the younger men in the clan and family. Sardar's position is supreme. Pashtoons lack central authority while religious leaders are the influential ones. Tribes have an almost equal social position, with the exception of the occupational groups, who enjoy higher status.

CHAPTER -5
PUBLIC CONSULTATION AND DISCLOSURE

5. PUBLIC CONSULTATION AND DISCLOSURE

5.1 GENERAL

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

The Government of Pakistan (GOP) as well as international financiers (e.g. ADB and World Bank) place great importance on involving stakeholders for determining the environmental and social impacts associated with project implementation. Therefore; the public consultation for Water Resources Building Project was carried out in accordance with the ADB principles of information dissemination, information solicitation, integration, coordination and engaging people in dialogue. The process included the participation of project affected persons (PAPs). The consultation process was carried out also in accordance with the requirements of Pakistan Environmental Procedures. The objectives of this process were to:

- Informing the public about what is proposed project.
- Identify and involve all stakeholders, especially local residents, in the consultative and participation process;
- Share information with stakeholders on the design and construction of the proposed project and anticipated impacts (positive / negative) on the physical, biological and socio-economic environment of the project area;
- Understand stakeholders' concerns regarding various aspects of the project, including the existing available facilities and problems, construction of the project and the likely impacts of construction and operation related activities;
- Understand the perceptions, assessment of social impacts and concerns of the communities in the vicinity of the proposed project;
- Provide an opportunity to the public in the public consultation session to provide valuable suggestions for the project design in a positive manner; and
- Reduce the chances of conflict through the early identification of controversial issues, and consult them to find acceptable solutions.

5.2 Public Consultation Conducted

Public consultations were conducted on 10 November 2020 to: (i) present the proposed new Water Resources building; (ii) provide a background information on the required IEE based on ADB's SPS 2009; (iii) provide background information and profile of the water resources building; (iv) conduct perception survey through key informant interview on the potential environmental, and social impacts of the project; and (v) ask for the recommendations and mitigation measures of the stakeholders on the implementation of the project.

The stakeholders consulted included the following: (i) representatives from the Project Director 100 dams Office; (ii) representatives from food department, (iii). Local inhabitants and (iv) national safeguards consultant. The consolidated response, comments and recommendations of the primary stakeholders on the project are the following:

i. Dust emission is expected to be generated during the implementation of the project.

ii. Noise during construction will affect the day-to-day activities on project site and nearby government buildings. The recommendation is to use construction equipment that produce less noise and fence the area undergoing construction activities;
iii. Use smaller construction vehicles to avoid road degradation and vehicular accidents in areas on narrow roads. Consider routes with wider roads and less-populated areas for large construction vehicles;
iv. Discussed about the use of water and sanitation/toilets for workers and staff of awarded contractor for water resources building.

The suggestions, comments and recommendations were incorporated in the final technical detailed design and environmental management plan (EMP) of the project.

5.3 Future Consultation and Disclosure

The public consultation and disclosure program with the stakeholders will remain a continuous process throughout the project implementation and will include the following:

1. IEE DISCLOSURE

The IEE report for the original loan will be disclosed on ADB's website. The IEE report and other relevant documents will also be made available at: (i) offices of implementing and executing agencies; and (ii) awarded contractor's office. It will be ensured that hard copies of IEE is kept at places which is conveniently accessible to all primary stakeholders.

2. CONSULTATION DURING CONSTRUCTION PHASE

The following consultation should be conducted during the construction phase: (a) public meetings with affected communities to discuss and plan work programs and allow issues to be raised and addressed once construction has started; and (b) meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and to provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

3. PROJECT DISCLOSURE

Further disclosure of the project details during the construction phase may include: (a) public information campaigns (via newspaper, flyers, and media) to explain the project to the wider city population and prepare them for disruptions they may experience once construction is underway; (b) public disclosure meetings at key project stages to inform the public of progress and future plans, and to provide copies of summary documents; (c) formal disclosure of completed project reports by making copies available at PMO office, and informing the public of their availability; and (d) providing a mechanism through which comments can be made.

Figure 11: Pictorial View of Interviews & Public Consultation





Figure 12: Attendance Sheet of consulted stkeholders

Project: Construction of Water Resources Building Quetta under BWRDSP

Sr. No	Name	Father Name	Signature/Thumb
1.	Abdul waheed	Abdul Rasheed	
2.	Abdul Hadi	Abdul wahab	
3.	Abdul Qadoos	Faqeer M	
4.	Imran Zulfiqar	M. Zulfiqar	
5.	Ameer Muhammad	M. USman	
6.	Ali Gul	Syed Gul	ALI GUL
7.	Mirzaid	Ameer Muhammad	
8.	Zubair Ahmed	Ghulam Nadir	
9.	Bilal Ahmed	Lowang Khan	
10.	Zahid ali	Mawa Khan	
11.	Yousaf Khan	Mirza Khan	
12.	M Farooq	M Azeem	

Date: 10/11/2020

Construction of Water Resource Building Quetta under BWRDS Project

Sr. No	Name	Father Name	Signature/Thumb
13.	Abdul Rashead	M. Baksha	
14.	Abdul Ghafar	Abdul Razaq	
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			

Date: 10/11/2020

CHAPTER -6
ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES

6. ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 INTRODUCTION

This chapter presents the potential environmental impacts of the project during pre-construction, construction and operation phases of the project and the recommended mitigation measures to address the environmental impacts. The analysis of the environmental impacts is focused on the civil works associated with proposed new water resources building.

The main purposes of the site assessment are the following:

(i) Identify any potentially significant environmental impacts from the civil works associated with the construction of Water Resources Building;
(ii) Observe the existing condition and the surrounding environment of proposed Water Resources Building; and
(iii) Consult and conduct survey interview on the primary stakeholders for their recommendations and suggestions on the implementation of the project.

Identification of significant impacts and formulation of the mitigation measure has been guided by the General Rapid Environmental Assessment (REA) Checklist and ADB SPS 2009.

6.2 ANTICIPATED IMPACTS AND MITIGATION MEASURES: PRE-CONSTRUCTION PHASE

Potential pre-construction phase impacts are primarily related to project siting, including land acquisition and resettlement and encroachment on historical, cultural, and archaeological sites and protected areas and the planning and details of the technical design.

6.2.1 Design Phase

i. Land acquisition and resettlement

The proposed water resources building does not have a significant impact on land acquisition and resettlement. The civil works for this water resources building is located on existing site and government-owned land of the Irrigation department, Balochistan. Access to the project site is through public right-of-way (ROW) and existing roads hence, land acquisition and encroachment on private property will not occur.

6.2.2 Construction Phase

The civil works anticipated during the construction activities are: (i) mainly the demolitions of existing building and disposing the demolition debris to designated dumping site/landfill of awarded contractor, it is recommended to use modern plant/machine to break/crush the building with pouring the water in order to suppress the dusty and noisy. (ii) laying of foundations; (iii) casting of ground floor slab; (iv) construction of floor beams and floor slabs (1st, 2nd, 3rd, ….); (v) construction of roof beams and roofing; (vi) pipe network for the sanitation and water facilities for the dormitories; (vii) architectural components and finishes; (viii) electricity connection for Water Resources Building; and (viii) the trucks hauling the demolition debris should be recommended to conducted during night times or weekends/public holidays to avoid the traffic during business/worked days and (ix) transportation of materials to, from and within the site.

The following discussions are the anticipated impacts during the construction phase of Water Resources Building. The impacts associated with the construction activities can be minimized and/or avoided with the implementation of mitigation and management measures.

i) Impact on Air Quality

Fugitive Dust Emissions

Air quality will be affected by fugitive dust emissions that usually caused by a combination of demolishing/decommissioning of existing building, on-site excavation and movement of earth materials, contact of construction equipment and machinery with bare soil, and exposure of bare soil and soil piles to wind. Excavation and backfilling works will also give rise to the increase in ground level concentration of total suspended particulate matter (TSP).

Mitigation Measures:

The mitigations measures include the following:

- Water spraying on Water Resources Building during breaking/demolition of building, road surface and work areas, as necessary, especially during dry weather;
- Ensure that truck tires, particularly for trucks carrying demolition debris, soil from excavation sites and construction areas, are cleaned to avoid spread of soil/dirt on roads which may cause muddy or dusty conditions during wet or dry periods, respectively.
- The material being transported or stored at the stockpiles will be kept covered with plastic to ensure protection of ambient air from fugitive emission during wind storm emissions.
- The contractor will monitor air quality on regular basis near the plant.
- Preventive measures against dust should be adopted for unloading operations.
- Grading operation will be suspended when the wind speed exceeds 20 km /hr.
- The plant should be located at least 500m away from any living area.
- Enforce the maximum speed limit to 20km/h for vehicles using embankments and access road.
- Road damage caused by project activities will be promptly attended to with proper road repair and maintenance work
- Proper Personal Protective Equipment (PPE) should be issued to the site worker and make sure the worker wears the PPE properly during working on site.

Smoke from Burning of Waste Material or Burning Firewood

A number of big and small fires in the labor camp can produce smoke and smog, which can cut off visibility, reduce traffic ability and cause suffocation along with causing diseases of respiratory tract.

Mitigation Measures:

The mitigations measures include the following:

- It is contractor's contractual obligation to use and provide clean and smoke free fuel in the labour camp.
- Cutting and burning trees or shrubs for fuel should be prohibited.
- Gas Cylinders should be used in the labor camp for cooking purposes.

Vehicular and Generator Exhaust Emissions

Emissions of noxious gases from movement of heavy machinery, batching plant and generators etc. would release emissions which would certainly add to the ambient air levels of the immediate vicinity. Especially the movements of heavy machinery and vehicles of old make and poor engine condition tends to release more than new well-tuned vehicles. Use of low-grade fuels and lubricants also increases the emission levels.

Mitigation Measures

The mitigations measures include the following:

- All vehicles during construction activities will be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions;
- Also, all vehicles and equipment used in the water resources building construction activities shall have valid certifications indicating compliance to vehicle emission standards.
- Emissions from power generators and construction machinery are important point sources at the construction sites. Proper maintenance and repair are needed to minimize the hazardous emissions.
- Batching plant should be set up considering the wind direction so that the nearby communities are not affected by the emissions from batching plant.
- NEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery should be enforced during construction works.
- Best quality fuel and lubes should be purchased where possible lead-free oil and lubes should be used.

ii) Soil Contamination

Surface soil has the potential to be contaminated by construction material, vehicle movements and various construction activities. Spillage of fuel, lubricants, cement and chemicals has the potential to result in contamination. Possible sources of spillage are:

- During transfer of fuel from one container to another or during refuelling
- Unloading of construction material due to careless handling
- Maintenance of equipment and vehicles
- Due to leakages from equipment and containers
- It is anticipated that a large quantity of excavated material will need to be disposed of. If this waste material is not properly disposed of, it will contaminate the soil and water resources, especially during the rainy season.

  This impact would be of moderate significance.

Mitigation:

The following practices will be adopted to minimize the risk of soil contamination:

- The contractor will be required to train its workforce in the storage and handling of materials like oils, diesel, petrol, other chemicals, concrete and cement, etc., that can potentially cause soil contamination. The contractor will be required to prepare a training manual and module for all the construction related activities along with the schedule of training program and submit to the supervising consultants for approval.

- Refuelling areas will have impervious concrete bases with appropriate drainage to prevent spills from contaminating the surrounding area.
- During on-site maintenance of construction vehicles and equipment, tarpaulin or other impermeable material will be spread on the ground to prevent contamination of soil
- Oils, fuels and hazardous materials will be stored in appropriately bounded areas. Fuel tanks will have to be placed within sealed bunds capable of containing the entire volume of the tank in case of leakage.
- Regular inspections will be carried out to detect leakages from vehicles and construction machinery
- Vehicles and/or equipment with leakage will not be used until repaired.
- Solid waste generated during construction and at camp sites will be properly treated and safely disposed of only in demarcated waste disposal sites.
- The construction phase will consume lot of cement additives and oils. The empty containers are produced. These containers still have dangerous amount of chemicals inside which can impact the humans as cancer producers. All such containers must not be sold to general public and must be destroyed and sent for recycle. This will be contractor's responsibility who must seek consultant's supervision. The people must be warned against use of empty chemical containers through local press and erecting banners in project area.

iii) Use of Local Water Resources

The water resources of the project area mainly comprised of groundwater that is being used by all communities for drinking purpose. There will be ample need of water not only for construction purposes (of concrete side slopes) but also for meeting the consumptive and non-consumptive needs of the campsites, workshop, washing yard, etc. It is obvious that these needs will be met from the existing groundwater resources of the project area. This impact would be of moderate significance.

Mitigation Measures:

Mitigations measures regarding use of local water supplies as follow.

- Availability of water for camp site facilities and construction purposes will be ensured by the contractor prior to start of construction activities. As per Local Government Act, the contractor will seek approval from the Local Government for exploitation of the water resources.
- The Contractor will be required to act as a go-between closely with local communities to ensure that any potential conflicts related to common resource utilization for project purposes are resolved quickly.
- The contractor will prepare guidelines for the workers for minimizing the wastage of water during construction activities and at campsites.

By adopting the aforementioned measures, the impact would be of low significance.

iv) Noise and Vibration from Construction Activities

The major sources of noise and vibration are from the operations of demolition of existing building, pile drivers, earth moving and excavation equipment, concrete mixers, cranes; and transporting equipment, materials and people. Noise and vibration from the construction activities may cause disruption of nearby buildings of irrigation department and nuisance to nearby other government buildings and other sensitive receptors (i.e. Mosque and Food department building). Also, noise and vibration due to the movement

of vehicles along the access road may potentially result to nuisance. Vibration from the construction activities may also cause damage to other structures and buildings in the project area. To minimize noise and vibration impacts, the following measures shall be implemented by the awarded contractor.

Mitigation Measures:

The mitigation measures will include the following:

- Vehicles and equipment used should be well fitted, as applicable, with silencers and properly maintained; that will reduce noise hazards according to permissible limits as fixed by Pak EPA (noise is 85 dB (A) while the WHO noise guidelines prescribed a limit of 55 dB (A).
- Construction workers will be provided suitable hearing protection like ear cap, or earmuffs and will be trained about their usage.
- Planning activities in consultation with the officials and staff of Irrigation department, Balochistan so that activities with the greatest potential to generate noise and vibration are planned during periods of the day that will result in least disturbance;
- All construction equipment and vehicles shall be well maintained, regularly inspected for noise emissions, and shall be fitted with muffler and other appropriate noise suppression equipment consistent with applicable national and local regulations;
- Impose speed limits on construction vehicles to minimize emissions along areas where sensitive receptors are located (i.e. others government buildings, mosque)
- Truck driver and equipment operators shall avoid the use of horns unless it is necessary to warn other road users or animals of the vehicle's approach; and
- Identify any buildings at risk from vibration damage and avoiding any pneumatic drills or heavy vehicles in the vicinity. Complete the civil works in these areas as quickly as possible.
- In accordance with the Environmental Monitoring Plan, noise measurements will be carried out on regular basis at locations and schedule specified to maintain the level within the NEQS level and to ensure the effectiveness of mitigation measures.

v) Quarry and Borrow Sites

The following measures shall be implemented at quarry and borrow sites to minimize impacts on water quality, reduce dust emission during transport, minimize soil erosion and siltation of nearby water courses and avoid damage to productive land and ecologically sensitive areas:

Utilize readily available sources of materials. If awarded contractor procures materials from existing borrow pits and quarries, ensure that these conform to all relevant regulatory requirements;

Borrow areas and quarries (if these are being opened up exclusively for the project) must comply with environmental requirements, as applicable.

Generation of Solid Wastes

The solid wastes that may be generated from the Water resources building construction activities are the following: (i) demolition debris of existing building estimated at, it is recommended to use the modern plant/machine with water spraying during the demolition and hauling the demolition debris during nigh time and/or weekends/public holidays and construction wastes such excess excavated earth (spoils), discarded construction materials, cement bags, wood, steel, oils, fuels and other similar items; (ii) domestic wastes such as food wastes, paper, plastic bag, and plastic bottles.
Improper solid waste management could cause odor and vermin problems, air

pollution, risks to health and safety, flow obstruction of nearby watercourses and could negatively impact the landscape.

Mitigation Measures:

The following mitigation measures to minimize impacts from waste generation shall be implemented by the awarded contractor:

- Construction materials and stockpiles of soils should be covered to reduce material loss;
- Stockpiles, lubricants, fuels, and other materials should be located away from steep slopes and water bodies and kept in adequately protected areas;
- Avoid stockpiling any excess spoils. Excess excavated soils should be disposed to approved designated areas; as mentioned in previous section, the awarded contractor will be accountable for the designated dumping site of demolition debris.
- Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to solid waste disposal site or landfill
- approved by local authorities;
- Prohibit open burning and littering or disposal of solid wastes into drainage/sewerage system and other watercourses;
- Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed in disposal sites approved by local authorities;
- Ensure that wastes are not haphazardly dumped within the project site and adjacent areas.
- All types of solid wastes must be disposed properly into waste bins for temporary storage before transporting them to be disposed into dump site or landfill approved by local authorities.
- Construction contractor must provide sufficient waste bins at construction site. Plastic bags and plastic bottles should be segregated for re-use or recycling.

vi) Biological Environment

The construction activities are located on existing irrigation building site and there are no protected areas, areas of ecological interest or environmental sensitive areas in or around the project site.

If during the project implementation, there will be cutting of trees or removal of vegetation, compensatory plantation for trees lost at a rate of ten trees for every cut tree. Special attention shall be given to protecting giant or old trees during implementation.

Mitigation Measures:

The following mitigation measures shall be implemented by project design and awarded contractor:

- Avoid cutting tree as much possible.,
- Prohibit burning of cleared vegetation.
- Re-planting trees near the sub-project to compensate for lost trees, provide shade and improve the landscape in the sub-project areas.

vii) Impact of Induced Traffic

Construction activities may result to an increase in movement of heavy vehicles for the transport of materials and equipment. Aside from the generation of noise and dust on hauling routes, the movement of construction vehicles will disrupt normal traffic patterns and expose the local community and the staff of Government departments in close vicinity to risk of injury or accidents. The following measures shall be implemented by the awarded contractor to minimize such impacts:

- Using locally sourced materials, whenever possible, to minimize transport distances;
- The awarded contractor should closely coordinate with local authorities and with the PMO for traffic management;
- Regular maintenance of vehicles and use of manufacturer approved parts to minimize potentially serious accidents caused by malfunction or premature failure;
- The awarded contractor must select duly licensed drivers with good track record;
- The awarded contractor should require its drivers to drive following national traffic policy and at lower speeds when passing through built-up and residential areas during daytimes and business days. The transportation of demolition debris is recommended to haul at night times, weekends and public holidays.
- The awarded contractor must ensure that vehicles are regularly maintained and in good working condition.
- The awarded contractor should regularly inform PMO on project construction schedule.

viii) Damage to Infrastructure

Transport of construction materials and other construction activities may cause damage to existing roads, drainage/sewerage system adjacent to the construction sites.

Mitigation Measures:

The awarded contractor shall implement the following measures to minimize the damage to existing infrastructure:

- The awarded contractor shall not allow overloading of trucks used for the transport of materials; and
- The awarded contractor will be required to repair damaged infrastructure resulting from the transport of materials and other construction activities. These infrastructures should be reinstated to their original condition upon completion of construction works.

ix) Occupational Health and Safety

Construction activities may cause harm and danger to the lives and welfare of workers. The awarded contractor should prepare occupational health and safety plan (OHSP) which will be part of the awarded contractor's contract documents. The occupational safety plan should have provisions on (i) providing personal protective equipment (PPE) like hard hats, safety gloves, ear mufflers to all workers; (ii) providing occupational health and safety training to all workers (i.e. first aid measures, prevention of diarrhea, HIV/AIDS); (iii) documenting safety procedures to be followed for all construction site activities; (iv) maintaining records of accident and the corrective actions implemented; and (v) emergency response plan during fire, earthquake and other incidents.

water and sanitation: Water resources building must be connected to local water supply. Recommended measures to be implemented by the awarded contractor for water and sanitation include:

- Provide adequate portable or permanent sanitation facilities serving all workers;
- It is recommended that contractor must build toilets as per number of its workers and should provide access toilets and water supply at the site.
- The awarded contractor must ensure that workers maintain cleanliness of sanitation facilities and construction areas.
- The awarded contractor must provide enough toilet and shower rooms in good condition for worker's usage. Additionally, the awarded contractor should provide sufficient water supply for washing/bathing and drinking water as well.

COVID-19 Pandemic: To ensure the spread of COVID in line with guidance/regulations of the Ministry of Health (MOH) and World Health Organization (WHO), PMO and Contractor will be responsible for ensuring that: 1) the contractor will provide safe, suitable and comfortable accommodation, kitchen, dining and sanitary facilities (toilet and bath); with an ample supply of clean water and the bathrooms have liquid soap provided for hand washing, 2) first aid supplies and personal protected equipment (PPE) will be provided for workers including face masks, 3) camp surroundings will be kept clean to prevent the spread of other vermin and insect vectors of disease, 4) a trained H & S officer will be designated by the contractor to ensure the proper implementation of the environment, health and safety programs and induction and training of the workforce during the construction phase, 5) for security and to maintain order in the camp and to avoid social conflicts with the local residents, camp rules will be strictly enforced including a nighttime curfew, 6) the contractors H&S plans will be updated to reflect the risk mitigation measures in respect of CoVID-19 and these need to be reviewed by Environment Safeguard Specialist to provide recommendations to the PCU/Contractor (H & S Officer) and to monitor the implementation of these H&S plans, 7) special precautions will be included to provide for enhanced cleanliness on site for the workers and ensuring that over-crowding of dormitories and canteen facilities are avoided to enable adequate social distancing and regularly disinfected, 8) the hiring of local unskilled labor from within the villages will be maximized to avoid the importation of laborers from other areas, and for skilled workers who are not from the area they should avoid close interaction with residents in the villages. 9) all persons who are working on the construction site will be advised to immediately report any symptoms of CoVID-19 to the site manager/H&S Officer immediately and make arrangements to self-isolate to avoid the risk of spreading infection, and 10) the H&S Officer at the construction site will be equipped with a digital thermometer to enable them to regularly check the temperatures of anyone who shows symptoms.

x) Community, Health and Safety

The construction activities will be working adjacent to irrigation department Balochistan building and management strategies must be implemented to protect both the people within this building and the nearby local community from physical, chemical, or other hazards associated with the construction sites. Risks may arise from unauthorized entry at the construction site, resulting to potential contact with hazardous materials, contaminated soils and other environmental media, or excavations and structures which may pose falling and entrapment hazards. Recommended measures to mitigate these risks, whenever applicable, include:

- The awarded contractor should prepare a Community Health and Safety Plan (CHSP) which should be developed in consultation with PMO, affected communities and local authorities. The CHSP should include specific emergency response

procedures and preparedness, communication systems and protocols, interaction with local emergency and health authorities and provision of emergency service vehicles.

- Restrict access to the construction site, through a combination of institutional and administrative controls, including the provision of fencing at the construction area and night lighting and signage on open trenches and excavation areas;
- Posting warning signs and information in the construction area on public safety hazards and emergency contact information;
- Providing security personnel in construction areas, if needed;
- Members of the local community will be given priority for employment in the construction activities. This will have the added benefit of avoiding social problems usually encountered when workers are sourced from other provinces; and
- Workers need to be aware of the following general rules: (i) no alcohol/drugs on-site;
- (ii) prevent excessive noise; (iii) no illegal activities such as, but not limited to gambling, and hunting farm animals in the area; (iv) trespassing on private/commercial
- properties adjoining the site is forbidden; (v) no littering in the adjacent open space of irrigation department office.

6.3 OPERATIONAL AND MANAGEMENT PHASE

There are no anticipated significant impacts during the operations and maintenance of the project. However, it will be implemented the following:

- Occupational health and safety for workers and staff such as the provision of first-aid kit, PPE;
- Emergency response plan during fire, earthquake and other incidents;
- Proper segregation, storage, collection and disposal of domestic solid wastes.
- Providing personal protective equipment (PPE) like hard hats, safety gloves, ear mufflers and other appropriate safety equipment to the workers and staff, if any minor repair or maintenance to the Water Resources Building.
- The management of water resource building should employee services of a contractor to regularly collect general solid waste from their offices and cafeteria, while hazardous waste will be negligible or none of them. The cleaners should also be take care of solid waste collection from the offices of this building.
- The drainage and sewerage system should be properly operating in water resource building

CHAPTER -7
ENVIRONMENTAL MANAGEMENT PLAN (EMP)

7. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

7.1 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

7.1.1 General

The EMP is a strategic approach towards the effective implementation of the mitigation measures and environmental protection of the Project Area and its surroundings. This EMP ensures that the undue or reasonably adverse impacts of a project are prevented and the positive benefits of the project are enhanced. According to this plan, all the activities related to various phases of the project are controlled and monitored.

This EMP encompasses all the phases of the project and may be used as a quick reference by the personnel(s) of client and contractors for effective implementation of the proposed mitigation measures and tracking the overall environmental performance of the project.

This EMP addresses all the significant impacts that are identified during the impact's identification process. It should be amended in consultation with the concerned regulatory authority; if any issue has been overlooked or if any need would arise as the project continues.

7.1.2 Structure of EM

The contents of this chapter are given below

- Regulatory Requirements
- Purpose & Need of the EMP
- Objectives of the EMP
- Scope of the EMP
- Institutional Arrangement for Implementation of EMP
- ❑ Institutional Arrangements for Implementation of EMP during Construction Phase
  a. Role and Responsibilities of the Functionaries involved in EMP Implementation
  b. Reporting Mechanism
  c. Non-Compliance of the EMP
- ❑ Institutional Arrangements for Implementation of EMP during Operation Phase
  a. Role and Responsibilities of the Functionaries involved in EMP Implementation
  b. Reporting Mechanism
- Environmental Mitigation Plan
- Environmental Monitoring Plan
- Implementation of EMP
- ❑ NOC and other Approvals
- ❑ Stakeholder Coordination
- ❑ Trainings
- ❑ Communication & Documentation
- Environmental Management Cos
- Change Management

7.1.3 Regulatory Requirements

This EMP refers to the applicable National and International legal framework for the proposed project for the protection of the environment.

7.1.4 Purpose & Need of the EMP

Primarily, the purpose of this EMP is to serve as a quick reference for the consultants, contractor as well as the proponents to implement the proposed mitigation measures effectively

and to monitor the overall environmental performance of the project.

Furthermore, to house the procedure, which the proponent follows to implement and maintain this EMP. The need of the EMP is mentioned as follows:

- Ensure that attention is paid to the actual environmental effects arising from construction, and operation of the proposed project;
- Ensure that anticipated impacts are maintained within the levels predicted;
- Ensure that unanticipated impacts are managed or mitigated before they become a problem; and
- Ensure that environmental management brings about real environmental benefits and achieves environmental sustainability, rather than the Environmental Approval Process being a mere paper chase to secure a development approval.

7.1.5 Objectives of the EMP

The main objectives of the EMP during different phases of the project is to implement mitigation measures and to evaluate the effectiveness of mitigation measures as proposed in the IEE and recommend improvement if any need would arise.

7.1.6 Scope of the EMP

The scope of the EMP includes the following phases of the project:

- Design Phase
- Construction Phase; and
- Operation Phase.

All the activities performed during these phases will be controlled and monitored according to this EMP.

7.1.7 Institutional Arrangement for Implementation of EMP

The following is a broad guideline has been proposed for institutional setup under this project as a reference for BID. It is based on the recommendations for PMO of ADB's Water Resources Building Project. The final organizational structure, working and monitoring of Institutional setup would be proposed by the BID and would be finalized in consultation with ADB's Resident Mission in Pakistan.

a) Institutional Arrangements for Implementation of EMP during Construction Phase

The Project Director (PMO, BWRDSP) will formulate an Environmental & Social Management and Monitoring Cell (ESMMC) which will comprise senior professionals, and should preferably have representative of various stakeholders.

The key players involved during construction stage of the proposed project are the ESMMC, 3rd Party M&E Contractor, Balochistan Environmental Protection Department/ Agency, the Contractor and the Supervisory Consultants (SCs). The roles, remits and responsibilities of these organizations are outlined below.

The following staff will be involved in the implementation of EMP:

- ESMMC Representative;

- 3rd Party M&E Contractor;
- SC's Environmental Specialist/Engineer; and
- Contractor's Environmental Engineer/Scientist.

The Construction Contractor will make a bond through contract documents to implement the EMP. The whole EMP will be included as a clause of the contract documents. The organizational setup for implementation of EMP is given below:

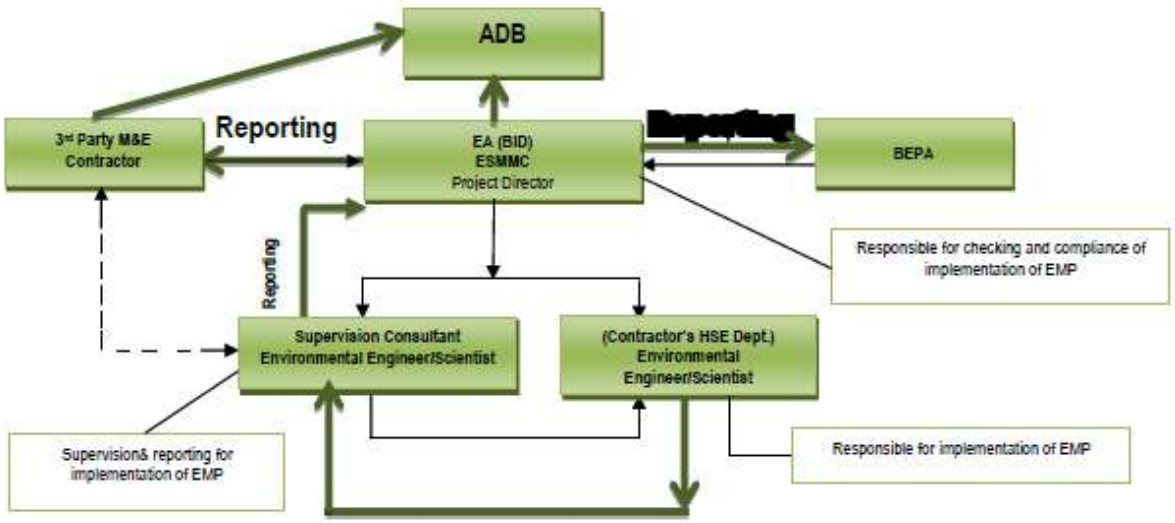


Figure 19: Organizational Setup for Implementation of EMP (Construction Phase)

❑ **Roles and Responsibilities**

a) BEPA

BEPA is the regulatory authority for issuance of NOC for this proposed project. As part of its mandate, protection of environment is its responsibility. Therefore, this agency will undertake an audit (as and when required) of project activities with respect to the protocols as defined in EMP.

b) 3rd Party M&E Contractor (if required)[2]

The 3rd Party M&E shall be responsible for:

- To make sure that all the contractual obligations related to the environmental and social compliance are met;
- To monitor the progress regarding implementation of environmental safeguard as provided in EMP;
- Oversee the Compliance of all the monitoring programs as given in EMP;
- Check randomly whether monitoring of the environmental aspects of the project during construction phase is being properly carried out;

[2] Normally on some of the ADB's Projects 3rd Party M&E contractor performed the monitoring of EMP as well.

- Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports, and make follow-up on these actions to ensure progress toward the desired outcomes;
- Make sure that the Contractor is implementing the additional measures suggested by the M&E Contractor; and
- Reporting the status of EMP compliance to BID and ADB

c) Project Director, PMO-BWRDSP:

Project Director through ESMMC will have responsibility for assuring implementation of EMP. This includes the following:

- Ensuring that the required environmental training is provided to the concerned staff;
- The Project Director will be responsible for carrying out random site visits to the construction sites to review the environmental performance of the Construction Contractors;
- Review monitoring reports for the progress of environment related activities;
- Make sure that the Construction Contractor is implementing the additional measures suggested by the Supervision Consultant in environmental monitoring reports;
- To assist Contractor for obtaining necessary approvals from the concerned departments.
- Maintaining interface with the other lined departments / stakeholders; and
- Reporting to the BEPA on status of EMP implementation.
- Reporting to ADB on status of EMP implementation.

d) Supervision Consultant: Resident Engineer

Resident Engineer's (RE) roles and responsibilities will be:

- To oversee the performance of Construction Contractor to make sure that the Construction Contractor is carrying out the work in accordance with the tender design and follow the specifications;
- Ensuring that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Strong coordination with the Construction Contractor and ESMMC.

e) Supervision Consultant: Environmental Inspector

The SC's Environmental Inspector will perform following roles and responsibilities:

- Directly reporting to the RE;
- Ensure the implementation of the mitigation measures suggested in EMP;
- To supervise and monitor environmental activities being performed at site;
- To organize periodic environmental training programs and workshops for the consultant's and contractor's staff with the help of Environmental Specialist.
- Suggest any additional mitigation measures if required.

f) Construction Contractor: Environmental Supervisor/Inspector

Contractor will be bond to appoint a Site Environmental Supervisor/Inspector with relevant educational experience and background. Contractor's Environmental Engineer/Scientist will carry out following activities:

- Implementation of the mitigation measures at construction site;

- Contractor will be bond through contract to take actions against all the special and general provisions of the contract document;
- Contractor will make sure the compliance of EMP recommendations and will also be responsible for effective liaison with local heads of villages;
- Provision of proper Personal Protective Equipment (PPEs) to the workers and train them for their proper use;
- To conduct the environmental and health & safety trainings to the workers/labor; and
- Coordinate with RE / Environmental Specialist of SC.

❑ Reporting Mechanism

Progress reporting related to environmental activities will be responsibility of Supervision Consultant, Environmental Specialist. He will also be responsible for submitting monthly EMP compliance report for the project to the PD-PMO. A bi-annual report of environmental activities shall be submitted to ADB by BID.

PD will in turn add his remarks / comments / feedback and submit the Report to ADB and BEPA in accordance with the frequency defined by them. In case the frequency is not defined and/or communicated, bi-annual monitoring reports based on the monthly monitoring report will be submitted to ADB for disclosure on ADB website.

❑ Non-Compliance of the EMP

The implementation of the proposed EMP involves inputs from various functionaries. Construction Contractor will be primarily responsible for ensuring implementation and reporting of the mitigation measures proposed in the EMP, which will be part of the contract documents. In addition, the Contractor will also need to prepare Site Specific Environmental Management Plan (SSEMP) and get it approved from SC / BID before start of any construction phase. The SSEMP will provide the risk rating for each construction activity and will provide mitigation measures to reduce activities with higher degree of risk. Various plans, and layout maps (construction camp layout plan) will also form part of SSEMP. The provision of the environmental mitigation cost will be made in the total cost of project, for which Construction Contractor will be paid on the basis of monthly compliance reports. However, if the Construction Contractor fails to comply with the implementation of EMP and submission of the monthly compliance reports, deductions will be made from the payments to the Construction Contractor claimed under the heads of environmental components.

❑ Institutional Arrangement for Implementation of EMP during Operation Phase

The key players involved during operation phase of the proposed project are BID. The roles, remits and responsibilities of BID is outlined below. The following staff will be involved in the implementation of EMP.

- **Roles and Responsibilities**

a) Environmental Engineer/Scientist

Environmental Engineer/Scientist will have responsibility for assuring implementation of EMP. This includes the following:

- Coordinating and planning the overall activities, as per EMP;

- Environmental Engineer/Scientist will randomly check the operation of project and make sure system is in compliance with EMP;
- Make sure that the WUA & FOs are implementing the measures suggested in the EMP and to report in environmental monitoring reports; and
- Bi-annual reporting to BEPA on environmental compliance of the project during operation stage.

7.1.8 Environmental Management Plan

Potential impacts and their mitigation measures are devised against the project activities to minimize their significance. Responsibilities for the collection and analysis of data as well as the reporting requirements have been outlined in Table 8-1. Implementation of environmental impact mitigation measures during construction is to avoid and reduce short- and long-term potential environmental impacts. Incorporation of environmental impact mitigation considerations into the tender and contract documents is a fundamental pre-requisite for effective implementation of the EMP.

Table 7-1 ENVIRONMENT MANAGEMENT PLAN (EMP)

Potential Environment	Mitigation Measures	Schedule	Institutional Responsibility	Monitoring
PRE-CONSTRUCTION PHASE				
Site-specific impacts and mitigation measures are not appropriate and sufficient to the final technical design of water resource	• Update IEE and EMP based on the final technical design of the project • Ensure updated EMP is provided to the awarded	Upon completion of the final technical design	Design Consultants	Included in the Project cost
CONSTRUCTION PHASE				
Air Pollution				
Generation of dust or particulate matter from on-site excavation, and movement of earth materials	• Water spraying on road surface and work areas, as necessary especially during dry weather • Place stockpiled soil in areas shielded from prevailing winds	During project construction	Awarded Contractor	Supervision Consultant
Emission from movement of heavy equipment and construction vehicles	• Truck carrying construction materials (sands, soil, stone, and other loose materials) should be covered with tarpaulin • Vehicles and equipment used during construction must be properly maintained and in good condition to ensure optimal performance. • All vehicles and equipment used in the construction activities shall have valid certifications indicating compliance to vehicle emission standards	During project construction	Awarded Contractor	Supervision Consultant
Water Pollution				
Run-off or soil erosion from stockpiled construction materials and spoils	• Impacts due to soil erosion will be mitigated by careful grading of the construction site such that water is not allowed to run off of the construction site into adjacent drainages. Where excavated soils are onsite, adequate measures will be implemented to control runoff, including covering exposed soils.	During project construction	Awarded Contractor	Supervision Consultant

Potential Environment	Mitigation Measures	Schedule	Institutional Responsibility	Monitoring
Domestic sewage from construction workers, accidental spillage of oil and other lubricants, wastewater from washing of construction equipment and vehicles and improper disposal of solid wastes.	• Implementation of solid wastes collection, storage and disposal system, with provision for waste segregation. • Provision on adequate on-site sanitation facilities with septic tanks and to channel sewage city sewerage system-Contractor will provide sufficient toilet room for workers and staff working site. • Place storage areas for fuels and lubricants away from any drainage/ sewerage system leading to water bodies. • Designate area for equipment and vehicle washing and maintenance. The washing cement mixers at site is not allowed. The huge volumes of concrete casting have to order from concrete seller/firm, bringing by heavy track. The area should be provided with oil and grease traps to prevent oil from being washed into drainage canals • Used oil should be stored at safe place for sale or disposal consistent with national and local regulations. Prohibit to disposal into the environment such as water course and other areas	During project construction	Awarded Contractor	Supervision Consultant

Noise and Vibration				
Noise pollution to other sensitive receptors: nearby government buildings, mosque etc in the project area.	• Planning activities in consultation with the staff and officials of PMOT so that activities should be at weekends, public holidays, and nighttime's. If operating during day times with the greatest potential to generate noise and vibration are planned during periods of the day that will result in least disturbance • Follow applicable national guidelines on permissible noise level during construction activities • All construction equipment and vehicles shall be well maintained, regularly inspected for noise emissions, and shall be fitted with muffler and other appropriate noise suppression equipment consistent with applicable national and local regulations • Prohibit workers from generating loud noise.	During project construction	Awarded Contractor	Supervision Consultant
Noise and vibration due to the movement of vehicles along the access road may potentially result to nuisance.	• The transportations of demolition debris and other construction materials should be made during weekends, public holidays, and nigh times. • During day time, to impose speed limits on construction vehicles to minimize emissions along areas where sensitive receptors are located (i.e. Government buildinds, Mosque) • Truck driver and equipment operators shall avoid the use horns unless it is necessary to warn other road users or animals of the vehicle's approach	During project construction	Awarded Contractor	Supervision Consultant

Vibration from the construction activities may cause damage to other structures and buildings in the area	• Identify any buildings at risk from vibration damage and avoiding any pneumatic drills or heavy vehicles in the vicinity. Complete the civil works in these areas as quickly as possible	During project construction	Awarded Contractor	Supervision Consultant
Quarry and Borrow Sites				
Operation of quarry and borrow sites could cause adverse impacts to surface water quality, elevated dust emission during excavation, soil erosion and siltation of nearby water courses, and potential damage to productive land and ecologically sensitive areas.	• Utilize readily available sources of materials. If awarded contractor procures materials from existing borrow pits and quarries, ensure that these conform to all relevant regulatory requirements. • Borrow areas and quarries (if these are being opened up exclusively for the project) must comply with environmental requirements, as applicable • Borrow area and quarry must not be located in culturally and ecologically protected areas.	During project construction	Awarded Contractor	Supervision Consultant
The management of soil stockpiling come from the foundation excavation, borehole from the foundation etc.	• The project owner has to designate the space to soil stockpiling at the construction site and immediately transporting outsider or manage to soil re-filling the site.	During project construction	Awarded Contractor	Supervision Consultant
Generation of Solid Wastes				
Improper solid waste management could cause odor and vermin problems, air pollution, risks to health and safety, flow obstruction of nearby watercourses and could negatively impact the landscape	• Construction materials and stockpiles of soils should be covered to reduce material loss. • Avoid stockpiling any excess spoils. Excess excavated soils should be disposed to approved designated areas. • Domestic solid wastes (i.e. food wastes) should be properly segregated in	During project construction	Awarded Contractor	Supervision Consultant

	biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site. • Prohibit burning and disposal of solid wastes into drainage/sewerage system. • Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed in disposal sites approved by relevant authorities. Ensure that wastes are not haphazardly dumped at dumping sites of Quetta. • Kitchen waste should be segregated for use of waste pickers/collectors.			
Biological Environment				
The activities are located on existing building site and there are no protected areas or areas of ecological interest in or around the project location.	• If during the project implementation, there will be cutting of trees or removal of vegetation, compensatory plantation for trees lost at a rate of 10 trees for every cut tree, will be implemented by the awarded contractors • Re-planting trees at project site to compensate for any lost trees provide shade and improve the landscape. At least the same as pre-project status.	During project construction	Awarded Contractor	Supervision Consultant
Cultural Heritage				
Construction activities are within the premises of Irrigation department land (old building site) which have been developed in time, thus no cultural heritage is expected to be found. However, mitigating measures must be in place for any possible "chance discoveries" made during construction work;	• If any cultural heritage material is encountered, all works at the discovery site should be immediately halted. • Without delay, the awarded contractor and/or site engineer will inform the project Director or coordinator of the find and report it to relevant authorities who shall decide on the measures to be taken during the chance discoveries. • Record of all discoveries should be maintained by the Awarded Contractor and/or	During project construction	Awarded Contractor	Supervision Consultant

The Chance Discovery Procedure will be put in place to include the following	Site engineer. • All project workers and staff shall be made aware of the Chance Discovery Procedure			
Traffic				
Aside from the generation of noise and dust on hauling routes, the movement of construction vehicles will disrupt normal traffic patterns and expose to staff/officers of Irrigation department and Food department to risk of injury or accidents	• The awarded contractor should closely coordinate with Irrigation department for traffic management • Regular maintenance of vehicles and use of manufacturer approved parts to minimize potentially serious accidents caused by malfunction or premature failure • The awarded contractor should be transported the demolition debris during weekends, public holidays, and nigh times. If operating during day times should require its drivers to drive lower speeds when passing through access roads • The awarded contractor should ensure that drivers are duly licensed with good track records. • The awarded contractor should ensure that vehicles and equipment are regularly maintained and in good working conditions.	During project construction	Awarded Contractor	Supervision Consultant
Damage to infrastructure				
Transport of construction materials and other construction activities may cause damage to existing roads, drainage/sewerage system adjacent to the construction site. The awarded contractor shall implement the following measures to minimize the damage to existing infrastructures	• The awarded contractor shall not allow overloading of trucks used for the transport of materials; and • The awarded contractor will be required to repair damaged infrastructure resulting from the transport of materials and other construction activities. These infrastructures should be reinstated to their original condition upon completion of construction works	During project construction	Awarded Contractor	Supervision Consultant
Occupational Health and Safety				
Construction activities may cause harm and danger to the lives and welfare of workers/staff	• The awarded contractor should prepare occupational health and safety plan (OHSP) which will be part of the contractor's contract	Must be established before the start of construction	Awarded Contractor	Supervision Consultant

	documents. The occupational safety plan should have provisions on (i) providing personal protective equipment (PPE) like hard hats, safety gloves, ear mufflers to all workers; (ii) providing occupational health and safety training to all workers (i.e. first aid measures, prevention of diarrhea, Dengue fever, HIV/AIDS); (iii) documenting safety procedures to be followed for all construction site activities; (iv) maintaining records of accident and the corrective actions implemented; and (v) emergency response plan during fire and other incidents • Provision of first-aid facilities for the workers and at least one safety and health officer should be assigned in the construction area. • Accessing/connecting to Quetta city water supply and sanitation to all workers/staff • Provide sufficient, safe, and easily accessible drinking water stations in the project building construction	activities During project construction	Awarded Contractor Awarded Contractor Awarded Contractor	
COVID-19 Pandemic	• The contractor will provide safe, suitable and comfortable accommodation, kitchen, dining and sanitary facilities (toilet and bath); with an ample supply of clean water and the bathrooms have liquid soap provided for hand washing. • First aid supplies and personal protected equipment (PPE) will be provided for workers including face masks. • Camp surroundings will be kept clean to prevent the spreadof other vermin and	Every working day at construction site/camp site	Awarded Contractor	Supervision Consultant

	insect vectors of disease. • A trained H & S officer will be designated by the contractor to ensure the proper implementation of the environment, health and safety programs and induction and training of the workforce during the construction phase. • For security and to maintain order in the camp and to avoid social conflicts with the local residents, camp rules will be strictly enforced including a nighttime curfew. • The contractors H&S plans will be updated to reflect the risk mitigation measures in respect of CoVID-19 and these need to be reviewed by Environment Safeguard Specialist to provide recommendations to the PCU/Contractor (H & S Officer) and to monitor the implementation of these H&S plans. • Special precautions will be included to provide for enhanced cleanliness on site for the workers and ensuring that over-crowding at rest room and canteen facilities are avoided to enable adequate social distancing and regularly disinfected. • The hiring of local unskilled labor from within the villages will be maximized to avoid the importation of laborers from other areas, and for skilled workers who are not from the area they should avoid close interaction with residents in the villages. • All persons who are working on the construction site will be advised to immediately report any symptoms of CoVID-19 to the site manager/H&S Officer immediately and make arrangements to self-isolate			

	to avoid the risk of spreading infection. • The H&S Officer at the construction site will be equipped with a digital thermometer to enable them to regularly check the temperatures of anyone who shows symptoms.			
Community Health and Safety				
Physical, chemical, or other hazards associated with the construction sites. Risks may arise from unauthorized entry at the construction site, resulting to potential contact with hazardous materials, contaminated soils and other environmental media, or excavations and structures which may pose falling and entrapment hazards	• The awarded contractor should prepare a Community Health and Safety Plan (CHSP) which should be developed in consultation with PMO management and relevant authorities. The CHSP should include specific emergency response procedures and preparedness, communication systems and protocols, interaction with local emergency and health authorities and provision of emergency service vehicle. • Restrict access to the construction site, through a combination of institutional and administrative controls, including the provisions of fencing the construction area and barricades, night lighting and signage on open trenches and excavation areas. • Providing security personnel in construction areas, if needed • Posting warning signs and information in the construction area on public safety hazards and emergency contact information. • Workers need to be aware of the following general rules: (i) no alcohol/drugs on-site; (ii) prevent excessive noise; (iii) no illegal activities such as, but not limited to gambling; (iv) no littering at site and adjacent areas;	Must be established before the start of construction activities During project construction	Awarded Contractor and PMO Awarded Contractor and PMO Awarded Contractor Awarded Contractor	Included in the project cost

	to avoid the risk of spreading infection. • The H&S Officer at the construction site will be equipped with a digital thermometer to enable them to regularly check the temperatures of anyone who shows symptoms.			

Key: CC=Construction Contractor, DC=Design Consultant, EA=Executing Agency, SC=Supervision Consultant, PD = Project Direct

7.1.9 Planning for Implementation of EMP

- **Stakeholder Coordination**

Notwithstanding the efforts so far put in for public participation, this activity will have to be pursued through the forthcoming implementation phases of the project. In particular, the focus will be on the improvement and modification of the proposed intervention designs.

Participation mechanisms facilitate the consultative process and include information sharing and dissemination, disclosure, and participation of affected people and other stakeholders in the project related activities. In the peculiar social set-up of the Project Area, it is also important to involve the religious leaders as representatives of the public as well as part of effective communication process. They can provide a very effective medium to bring information to the affected male population through Friday prayers. Local business community, specially the affected one, should also be brought into the process of awareness and participation.

The related institutional arrangements should also be in place for continuous consultation throughout the process of planning, implementation and liaison with key stakeholders through continuous process of information disclosure, consultation and participation.

7.2 TRAINING

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. An environmental and social training and Technical Assistance (TA) program is to be carried out before the implementation of the project. Contractor's environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult for the Contractor(s) workforce to implement effective environmental protection measures. A suitable training program is proposed to train the Contractor(s) staff who will be involved in the Construction Phase and the professional staff from the proponent involved at the operational stage of the project.

Contractor's environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult for the Contractor(s) workforce to implement effective environmental protection measures. A suitable training program is proposed to train the Contractor(s) staff who will be involved in the Construction Phase and the professional staff from the proponent involved at the operational stage of the project.

The training consultant will organize training courses for Proponent and Contractor staff to train them in specialized areas such as air and noise pollution monitoring and water quality monitoring etc. The details of this training program are presented in Table 7-2.

Table 7-2: Personnel Training Program

Training Provided by	Contents	Trainees	Duration
supervision / training consultants/ organizations specializing in environmental management and monitoring	Short seminars and courses on: Environmental laws and regulations, daily monitoring and supervision	• Irrigation Staff • Contractor • project staff • Project Implementation Staff	1 day
Training consultants/ organizations specializing in social management and monitoring	Short seminars and courses on: Social awareness	• Project staff dealing • in Social/lands • matters	1 day
Training consultants/ organizations specializing in Occupational, health and safety issues	Short lectures relating to Occupational Safety and Health	• Contractor's staff	2 days

7.3 COMMUNICATION & DOCUMENTATION

Communication and documentation are an essential feature of EMP. The key features of such mechanism are:

- **Data Recording and Maintenance**

All forms to be used for recording information during the environmental monitoring will follow a standard format which will correspond to the data base in to which all the gathered information will be placed. Check boxes will be used as much as possible to facilitate data entry. Tracking system will be developed for each form.

- **Database**

The database may include the following information:

- Training programs;
- Staff deployment;
- Non-compliance;
- Corrective actions
- List of environmental data and
- List of environmental data to be maintained:
- Soil and land pollution

- Disposal of excavated silt and earth
- Disposal of waste
- Water resource
- Fuel oil and chemical spills
- Vegetation record
- Noise pollution
- Air and dust pollution
- Socio-economic data

- **Meetings**

The following environmental meetings during the project will take place. Primary meeting for setting out the requisite end frame sounding for the regular meetings. Scheduled meetings between Contractor and Supervising Consultants.

The purpose of the meeting will be to discuss the conduct of the operation, non – compliances noted by the consultant's environmental team and measures for their remedy. The meeting will be recorded in the form of a daily/monthly environmental report.

- **Social Complaint Register**

The Supervising Consultant (SC) and ESMMC will maintain a register of complaints record from local communities and measures taken to mitigate these concerns.

- **Photographic Records**

Contractors, SC and ESMMC will maintain photographic records during the implementation of the project. As a minimum, the photographic records will include the site photographs, all the roads, camp sites and monitoring activities etc.

7.4 GRIEVANCE REDRESSAL MECHANISM

A grievance mechanism will be available to allow an AP appealing any disagreeable decision, practice or activity arising from land or other assets compensation. APs will be fully informed of their rights and of the procedures for addressing complaints whether verbally or in writing during consultation, survey, and time of compensation. A detailed project specific GRM is in Annexure 6.

7.5 ENVIRONMENTAL MANAGEMENT COST

The budget presented in **Table 7-3, 7-4 & 7-5** will include estimates for the cost of mitigation measures, staff employed for implementation of the EMP and technical assistance.

Environmental Management Cost

Table 7-3. Budget Estimate for Environmental Monitoring During the Construction and Operation Phases

Components	Parameters	Monitoring Location	No. of Samples/unit	Frequency	Responsibility	Cost Rs
During Construction Period						
Air quality	CO, NOx, SOx, PM_{10}	Construction site, batching plant site, and access road/borrow area, nearby village (SC will guide)	4 (Total= 24)	Quarterly	Proponent[1] (though Environmental lab)	600,000
Ground Water Quality	Physical-chemical parameters, biological contamination, heavy metals	Nearby Construction site	1 (Total=6)	Quarterly	Proponent (though Environmental lab)	84,000
Noise Level		Construction site, camp site, access roads, nearby community	4 (Total= 24)	Quarterly	Proponent (though Environmental lab)	48000
A. Sub-Total						**Rs.732,000**
During Operation & Maintenance Period (one year)						
Air quality	CO, NOx, Sox, PM_{10}	PMU will guide	2 (Total = 4)	Bi-annually	Proponent (BID)	50000
Ground Water Quality	Physical-chemical parameters, biological contamination, heavy metals		1 (Total = 2)	Bi-annually	Proponent (BID)	28,000
Noise Level			4 (Total = 8)	Bi-annually	PMU, BWRDP	16,000
B. Sub-Total			**Rs. 94,000**			
Total (A+B) =			**Rs. 826,000**			

Table 7-4: Cost of Proponent

Sr. No	Description	Amount
1	Environmental Monitoring cost for construction & operation period (from Table 8-4)	Rs.8,26000
	Rs. 8,26000	

Table 7-5: Cost of Contractor

Sr. No	Description	Amount
1	Contractor Environmental Engineer salary @ Rs. 80,000/month	Rs. 14,40000
2	Health & safety measures to manage COVID-19	Rs. 500,000
3	Noise monitoring, Dissolved Oxygen, pH and Electric Conductivity (EC) of the water Monitoring on Monthly Basis[2]	Rs. 250,000
Total Cost	**Rs. 21,90000**	

Total EMP Cost = Rs. 30,16000

SC= Supervision Consultant, PMU: Project Management Unit

[1] Proponent (BID) will hire an Environmental laboratory for Air, Noise quality monitoring and Water quality testing and will perform environmental testing according to Table 8-6.

[2]Contractor will purchase DO meter, EC meter, pH meter, Noise meter for monthly monitoring

CHAPTER -8

CONCLUSIONS AND RECOMMENDATIONS

8. COCLUSIONS AND RECOMMENDATIONS

8.1 GENERAL

This section presents the major conclusions and key recommendations of the IEE study.

Findings and Recommendations

The location of the construction activity is on existing old building of irrigation department Balochistan that will be demolished. During the preparation of the initial environment examinations, the final detailed design has proposed a three-storey water resources building. To ensure the structural integrity of the new structures, the design should comply with applicable national and international standards/guidelines and the technical design of Water Resources Building shall take into consideration the following: (i) follow the regulations and guidelines including Building Code for Quetta Municipality, 1937 and the Balochistan Building and Town Planning Rules, 1979, and building codes of Pakistan (ii) construction of sanitation facilities conform with the local regulations and guidelines (iii) follow applicable rules and regulations on structural integrity of building structures.

The anticipated impacts on the physical and biological environment are strictly implementing in the EMP. The following are the anticipated impacts and the corresponding mitigation measures during the construction phase of the Project:

(i) air pollution from the dust emissions from on-site excavation, movement of earth materials and emission from movement of heavy equipment and construction vehicles which will be mitigated by good construction practices such as water spraying on access road surface and work areas, covering all materials during transportation, and proper maintenance of construction vehicles and equipment;

(ii) water pollution from run-off or soil erosion from stockpiled construction materials and wastewater from domestic sewerage of construction workers and accidental spillage of oil and other lubricants from washing of construction equipment which will be mitigated by covering exposed soils, construction of temporary silt traps, and provision of adequate and on-site sanitation facilities;

(iii) noise pollution from the construction activities resulting to disturbance of nearby government buildings which will be mitigated with continuous consultation with the PMO and PIO involved staff on the schedule and time of construction activities and the use of noise suppression on construction equipment;

(iv) Demolition debris of existing building will be disposed at the designated dumping site landfill, as requires bidding contractor/bidder to be accountable for dumping the demolition debris at their designated dumping site.

(v) The solid waste from the construction of proposed water resources building will be mitigated by the provision of waste bins in the construction site and the proper segregation, temporary storage, collection and disposal of solid wastes by a contractor hired for for solid waste & recyclable collection & disposal service.

(vi) occupational health and safety in the construction site causing harm and danger to the lives and welfare of works which will be mitigated with the implementation of occupational and health safety plan including the provision of personal protective equipment to all workers and staff; COVID-19 managing risk and prevention has included in the civil work implementation of water resource building as well

(vii) community health and safety such as the disruption of normal traffic patterns,

damage or degradation of access roads from the transport of materials and risks from unauthorized entry to the construction resulting to accidents. There will be mitigated by the implementation of community health and safety plan which will includes the provision of fencing to enclose the area of civil works and posting warning signs and information in the construction area.

During the operations and maintenance of the water resource building, PMO will ensure the implementation of proper segregation, collection and disposal of solid waste, connecting and accessing of Quetta City water supply and sanitation facilities to all workers and staff, implementation of occupational health and safety to all workers and staff, and emergency response plan during fire and other incidents.

The mitigation and monitoring measures from the anticipated impacts are included in the environmental management and environmental monitoring plans (EMP and EMoP) which will be part of the bidding documents of the project. The schedule, budget and responsible authority for the implementation are also included in the EMP and EMoP. Also, the awarded contractor will require to prepare a Site Specific Environmental Management Plan (SSEMP) based on the updated EMP approved by the PMO, prior to the construction activities. The concerns and recommendations of the primary stakeholders were also incorporated in the EMP.

Results of the initial environment examination show that the construction of the water resources building will not result to significant adverse environmental impacts. The anticipated impacts during the construction of the project can be easily mitigated with the implementation of EMP and EMoP.

Annexes

Annexure 1: REA (Rapid Environmental Assessment (REA) checklist for Irrigation)

Project Title:	**Construction of Water Resources Bulding Quetta under BWRDSP**
Sector/Division:	**Irrigation Department, Balochistan**

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		√	The construction of proposed new Water Resources Building will be done on existing old building site. There is no protected areas or area with cultural and historical importance in or near the locations of proposed new Water resources building
▪ Legally protected Area (core zone or buffer zone)		√	
▪ Wetland		√	
▪ Mangrove		√	
▪ Estuarine		√	
▪ Special area for protecting biodiversity		√	
B. Potential Environmental Impacts Will the Project cause…			
▪ impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to physical cultural resources?		√	See above remarks
▪ disturbance to precious ecology (e.g. sensitive or protected areas)?		√	
▪ alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?		√	
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		√	The proposed new Water resources building will be connected to water supply of Quetta city. The sewerage and drainage system will be connected to Quetta city also.

Screening Questions	Yes	No	Remarks
▪ increased air pollution due to project construction and operation?	√		Generation of dust and noise from site excavation, movement of earth materials and movement of heavy equipment and construction vehicles is anticipated during the construction phase of proposed new Water resources building. Such impacts are mitigated through the EMP implementation strictly. Mitigation measures such are water spraying, tarpaulin cover on trucks carrying sand, soil and stone, and consultation for the schedule of construction activities will be implemented in the EMP.
▪ noise and vibration due to project construction or operation?	√		
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)		√	Not applicable. The location of the construction activities are within the existing land of Irrigation department, Balochistan
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	Not applicable. The construction of proposed new Water resources building within Irrigation department, Balochistan land boundary
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?		√	Not anticipated but mitigation measures included in the EMP.
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		√	
▪ social conflicts if workers from other regions or countries are hired?		√	Not anticipated because proposed new Water resources building is in Quetta City.
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	√		The awarded contractor will be required to submit an occupational health safety plan prior to the start of construction activities. Also, mitigation measures are included in the EMP.
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		√	Not applicable. Construction and operation will not involve use of explosives and chemicals.
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		√	Community health and safety risks and hazards shall be managed by implementation of community health and safety plan, stated in the EMP. The awarded contractor has to indicate the method of demolishing/decommissioning of the existing building of Irrigation
▪ generation of solid waste and/or hazardous waste?	√		The solid waste and other waste will be collected by private service provider regularly

Screening Questions	Yes	No	Remarks
▪ use of chemicals?		√	Not applicable
▪ generation of wastewater during construction or operations?		√	Not anticipated. Mitigation measures to prevent water pollution during construction and operation are included in the EMP.

Annexure 2: Pictures of The Project Area

Food Department Building in surrounding

Project Director, 100 Dams project office adjacent to Proposed project site

Main Entrance of Proposed Project site

Mosque in vicinity

Flora of the Project Area