



*Environmental Management Plan*  
*For*

**Lebanese Land Administration  
Modernization Project**

**Beirut, Lebanon  
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## Contents

Executive Summary of the Environmental Management Plan (EMP).....	4
Section I- Environmental Management Plan and Guidelines.....	6
1- Introduction.....	6
2- Project Description.....	7
3- Implementation Arrangements.....	10
4- Safeguards Considerations.....	11
5- Site Screening and Review.....	13
6- Mitigation Measures Plan.....	15
Section II- General Safety, Health and Environmental Regulations.....	20
1- Introduction.....	20
2- Compliance with Regulations.....	20
3-Failure to Comply with Regulations.....	21
3.1 General.....	21
3.2 Fines.....	22
4- General Requirements.....	23
4.1 Preamble.....	23
4.2 Safety Monitoring.....	23
4.3 Control of Substances Hazardous to Health.....	23
4.4 Potential Hazards.....	23
4.5 Accident Reporting.....	23
4.6 Notices, Signs, etc.....	24
4.7 First Aid and Medical Attention.....	24
4.8 Employee Qualifications and Conduct.....	24
5- Safety Requirements.....	24
5.1 Personal Protective Equipment.....	24
5.2 Fire Protections and Prevention.....	25
5.3 Electrical Safety.....	27
5.4 Oxygen/Acetylene/Fuel Gases/Cartridge Tools.....	28
5.5 Scaffolding/Temporary Works.....	28
5.6 Use of Ladders.....	29
5.7 Elevated Work.....	29
5.8 Use of Temporary Equipment.....	30
5.9 Locking-out, Isolating, and Tagging of Equipment.....	31
5.10 Installation of Temporary or Permanent Equipment.....	31

5.11 Laser Survey Instruments .....	31
5.12 Demolition.....	31
5.13 Concrete Reinforcement Starter Bars .....	32
6- Environmental and Health Requirements .....	32
6.1 Protection of the Environment.....	32
6.2 Air Pollution .....	32
6.3 Water Pollution.....	32
6.4 Solid Waste.....	33
6.5 Noise Control.....	34

## Executive Summary of the Environmental Management Plan (EMP)

In Arabic

### ملخص تنفيذي عن خطة الإدارة البيئية

#### الخطة الإصلاحية

بالرغم من مكنته أمانات السجل العقاري ودوائر المساحة بين عامي 1998 و2004، ما زالت تعاني المديرية العامة للشؤون العقارية من عدّة مشاكل تُؤثر سلباً على الإقتصاد اللبناني، وتؤدي إلى زيادة حالات الفساد، وتراجع الإستثمارات المحلية والأجنبية.

في العام 2015، أطلق وزير المالية خطة إصلاحية شاملة لتطوير وتحديث المديرية العامة للشؤون العقارية.

تهدف الخطة الإصلاحية إلى بناء إدارة حديثة وفاعلة، ذات هيكلية تنظيمية وبنى تحتية تتماشى والإصلاحات المتوخاة، وذات موارد بشرية كفوءة تتمتع بمهارات عالية وتستخدم أدوات متطورة وحديثة، بالإضافة إلى تقديم خدمات عالية الجودة.

#### مشروع تحديث المديرية العامة للشؤون العقارية الممول من البنك الدولي

تمّ وضع مشروع لتحديث المديرية العامة للشؤون العقارية بالتعاون مع البنك الدولي. سوف يخدم المشروع عملية إتخاذ القرارات في لبنان بشكل عام، بالإضافة إلى إدارة أملاك الدولة، وعمليات التخمين، وتحسين الإيرادات بشكل خاص.

تتألف المرحلة الأولى من المشروع، وتقدر كلفتها بحوالي 50 مليون دولار أمريكي، من خمسة مكونات هي:

**المكوّن أ:** تحديث النظام الرقمي للسجل العقاري والمساحة: تطوير نظام جديد متكامل للسجل العقاري والمساحة، وإنشاء بيئة رقمية بالكامل. بالإضافة إلى تحديث مراكز البيانات، وإعادة تصميم أمانات السجل العقاري ودوائر المساحة.

**المكوّن ب:** البنى التحتية الوطنية للبيانات المكانية: تحسين عملية تحديد وتخزين واستخدام وتبادل البيانات والخدمات الجغرافية المكانية في لبنان.

المكوّن ج: تخمين العقارات وفرض الضرائب: تطوير منهجيات حديثة لتخمين العقارات المبنية وغير المبنية في لبنان.

المكوّن د: إدارة أملاك الدولة: تسجيل أملاك الدولة في السجل العقاري، وتطوير وحدة داخل النظام الجديد لتكنولوجيا المعلومات والاتصالات خاصة بإدارة أملاك الدولة.

المكوّن ه: التطوير التنظيمي والمؤسسي وبناء القدرات: تحسين الحوكمة بالإضافة إلى قدرات المديرية العامة للشؤون العقارية، وتحسين الإطارين التشريعي والتنظيمي، بالإضافة إلى ضمان جودة تنفيذ المشروع ضمن المهل المحددة.

### خطة الإدارة البيئية

من غير المتوقع أن يكون لأنشطة المشروع أي أثر سلبي كبير على البيئة. بيد أنه قد تؤثر عمليات الترميم المذكورة في "المكوّن أ" ، وبشكل طفيف، على البيئة.

إنطلاقاً من هنا، تمّ وضع خطة للإدارة البيئية، تأخذ بعين الاعتبار القوانين الموضوعية من قبل الدولة اللبنانية بما يخصّ القضايا البيئية المتعلقة بالبناء.

كما يتوجب على عمليات الترميم الممولة من خلال هذا المشروع، أن تتبع القوانين البيئية الموضوعية من قبل وزارة البيئة في لبنان، وكذلك سياسات البنك الدولي المتعلقة بالإجراءات الوقائية. ويندرج هذا المشروع تحت الفئة "ب"، ويؤدي إلى تقييم بيئي جزئي يندرج بدوره تحت الإجراء الوقائي "التقييم البيئي OP/BP 4.01".

من هنا، سوف يتمّ إيلاء اهتماماً كبيراً لمسائل الغبار، والضجيج بسبب أعمال الترميم، وضمان السلامة في الموقع، والتخلص من المخلفات.

وسوف يتم إدراج الشروط والتوجيهات البيئية كجزء لا يتجزأ من وثائق المناقصات. كما أن مسؤولية التأكد من قيام المتعهدين بالالتزام بالشروط المذكورة في خطة الإدارة البيئية، ومن وجود الرقابة والإشراف الملائمين لتطبيقها، تقع على عاتق "وحدة تنفيذ المشروع".

## **Section I- Environmental Management Plan and Guidelines**

### **1- Introduction**

Good land governance is currently an important area of attention for the Arab region. The way land is accessed, used and controlled is a key element of sustainable social and economic development, peace and stability, and realization of human rights.

The Lebanese Land Registry was established in 1926 under the French mandate. The working rules and methods that were defined in that era, have witnessed no major developments, except for the automation of the Land Registry and Cadastre that was carried out between 1998 and 2004 and considered of major importance.

However, after 12 years of implementation, mapping is still incomplete, GIS capabilities have not been capitalized, a very extensive data base has been developed but it is not used properly, laws are still obsolete, procedures have not been reengineered, and the IT systems and infrastructure have become outdated.

Those circumstances, among others, slow down the work, increase corruption and negatively affect the Lebanese economy, discouraging domestic and foreign investments.

In May 2015, the Minister of Finance launched a reform program aiming to build a modern and efficient land administration with an organizational structure and infrastructure that are in line with the envisaged reforms, enjoying qualified and highly skilled human resources who use advanced equipment, in addition to providing excellent services.

The General Directorate of Land Registry and Cadastre (GDLRC) committed to make the Lebanese land system leading in the region, and developed, with the World Bank's support, a fully-integrated modernization project.

Modernizing the GDLRC will enhance Lebanon's public administration, legislation and real estate market development. Additionally, it will help attract local and foreign investments (e.g., construction, industrial and commercial development, etc.), promote economic growth, increase environmental protection, reduce corruption, restore trust in GDLRC and achieve sustainable development. It will positively affect built property taxation by making it more equitable.

It will also make the resolution of real property disputes easier and faster, and provide digital information essential for urban and rural planning, as well as planning and management of utilities and roads.

Furthermore, it will facilitate access to credit, while reducing the risk faced by banks due to inadequately secured housing loans.

Stakeholders from both public and private sector showed a full support and expressed their will to cooperate in order to successfully implement the project.

This Environmental Management Plan (EMP) was specifically prepared for the “Land Administration Modernization Project”.

## 2- Project Description

The project aims at improving access to land use data, property rights data, and geospatial information. The project investment will serve decision making in Lebanon in general, and state land management, property valuation and revenue enhancement in particular.

The project comprises 5 components with an estimated cost of USD 50 million for a period of 5 years.

### **Component A: Modernization of the digital Land Registry and Cadastre system:**

The component’s objective is to establish a modern land registry, cadastre and state land management system, and create a completely digital environment.

The plan is to implement one integrated system, improve ICT infrastructure, implement e-services and integration with external systems, establish digital archives, scan Index Maps and integrate them into the system, modernize Datacenters and redesign office premises to better serve customers.

### **Component B: National Spatial Data Infrastructure (NSDI):**

The component’s objective is to enhance the identification, storage, use, sharing and exchanging of geospatial data and services in Lebanon. This would be achieved by providing access to Land Registry and Cadastre data and other public geospatial datasets through the NSDI. The NSDI would serve users and providers within all levels of government, non-governmental organizations, private sector, academia and the public.

The first implementation step towards the establishment of an NSDI, is the development of an NSDI strategy and implementation plan including the institutional framework, the technical framework and ICT standards, the fundamental data and services that will be provided, the legal framework (laws, agreements on sharing data, etc.) and financial framework.

The component will also support the creation, production and coordination of data, develop a capacity building and knowledge transfer program, creation of the Geoportal and how it is going to be linked to the e-Government.

### **Component C: Property Valuation and Taxation**

This component will provide tools to value all built property and undeveloped land in Lebanon. This would increase market transparency, reduce banking sector/mortgage risk, as well as enhance the recurrent property tax.

The situation analysis will help understanding the current valuation processes and defining legislative gaps, and therefore assist in deciding on the tax base for the property taxation.

The following steps will include the development of mass valuation methods and pilot project, the data inventory, the creation of a land value map and development of the real estate indices, the mass valuation of all private and public properties, training and capacity building, and public awareness activities.

#### **Component D: State Land Inventory and Management**

The component's objective is to integrate the State Lands into the Land Registry and Cadastre by applying the new State Land Management System and testing systematic enhancements.

This component will develop a state land management strategy and an implementation plan, and do all preparations to enable data exchange with all stakeholders. It will also complete the inventory of state lands and reclassify the current information.

There will be no field visits, however, geospatial data enhancement studies and pilots including cadastral surveys, renewal of cadastral mapping, new valuations, etc... are permitted.

#### **Component E: Regulatory and Institutional Development, Capacity Building and Project Management**

The objective of this component is to improve the capacity and governance of the GDLRC and ensure quality and timely implementation of the project.

The component will develop and implement an institutional vision, strategy, citizen service charter and operational plan for GDLRC, modernize and improve the regulatory framework, implement structures to enhance the accountability of GDLRC, and enhance GDLRC's HR policies and procedures.

A Project Implementation Unit (PIU) will be established and will be responsible for the project management, fiduciary functions and monitoring and evaluation. It will work according to the World Bank standards.

Given the above components and their associated activities, the sound application of the World Bank's Safeguards Policies and World Bank Group Environmental, Health and Safety (EHS) Guidelines is integral for ensuring the prevention and mitigation of undue harm to people and their environment during the development process.

The World Bank's environmental and social safeguard policies are a cornerstone of its support to sustainable poverty reduction. The effectiveness and development impact of projects and programs supported by the Bank has substantially increased as a result of attention to these policies. Safeguard policies have often provided a platform for the participation of stakeholders in project design, and have been an important instrument for building ownership among local populations.

The World Bank environmental and social safeguards policies are listed below and the relevant policy triggered by this project, **OP 4.01 Environmental Assessment** is expanded and explained in section 4 of this document:

- 4.01 Environmental Assessment
- 4.04 Natural Habitats
- 4.09 Pest Management
- 4.10 Indigenous Peoples
- 4.11 Physical Cultural Resources
- 4.12 Involuntary Resettlement
- 4.36 Forests
- 4.37 Safety of Dams
- 7.50 Projects on International Waterways
- 7.60 Projects in Disputed Areas

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. These industry sector EHS Guidelines are designed to be used together with the **General EHS Guidelines** document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors. The General EHS Guidelines are divided into four distinct sections and outlines below, they are also available online at [www.ifc.org/ehsguidelines](http://www.ifc.org/ehsguidelines):

## **1. Environmental**

- 1.1 Air Emissions and Ambient Air Quality
- 1.2 Energy Conservation
- 1.3 Wastewater and Ambient Water Quality
- 1.4 Water Conservation
- 1.5 Hazardous Materials Management
- 1.6 Waste Management
- 1.7 Noise
- 1.8 Contaminated Land

## **2. Occupational Health and Safety**

- 2.1 General Facility Design and Operation
- 2.2 Communication and Training
- 2.3 Physical Hazards
- 2.4 Chemical Hazards
- 2.5 Biological Hazards
- 2.6 Radiological Hazards
- 2.7 Personal Protective Equipment (PPE)
- 2.8 Special Hazard Environments
- 2.9 Monitoring

### **3. Community Health and Safety**

- 3.1 Water Quality and Availability
- 3.2 Structural Safety of Project Infrastructure
- 3.3 Life and Fire Safety (L&FS)
- 3.4 Traffic Safety
- 3.5 Transport of Hazardous Materials
- 3.6 Disease Prevention
- 3.7 Emergency Preparedness and Response

### **4. Construction and Decommissioning**

- 4.1 Environment
- 4.2 Occupational Health and Safety
- 4.3 Community Health and Safety

Section 3 and 4 below provide how the World Bank Safeguard Policies are applied to this project.

### **3- Implementation Arrangements**

The project activities will not entail any significant environmental impacts. However, the minor renovation works that are planned under Component A for the technical facility and office space would result in minimal environmental impacts.

The environmental conditions and guidelines will be included as an integral part of the tender documents. The PIU will be responsible to ensure that the contractors will abide by these conditions and that there is adequate monitoring and supervision for such measures.

Safeguards monitoring results will be described in the periodical reports prepared by the PIU. The monitoring reports should follow the timeline outlined below:

- Inception Audit Report at commencement of renovation activities (that is, identifying site, site clearing and set up of site offices during renovation)
- Bi-Weekly Monitoring Audit Reports during renovation activities
- Quarterly Compliance Monitoring Reports
- Final Compliance Monitoring Report at the end of renovation activities

The purpose of these guidelines is to provide the project technical staff, local communities, implementing agencies, environmental consultants, contractors, and other related parties with a set of guidelines that will assist them in determining to what extent the rehabilitation proposed to be financed will affect the environment and possibility to improve it. The guidelines are designed to assist all those who are working on rehabilitation, in order to ensure that environmental concerns are duly incorporated in the project design and implementation.

This EMP takes into account all government's regulations on environmental issues relating to renovation.

Any unlikely potential negative environmental impacts would be localized and mitigated during the execution stage. Contracts and bill of quantities will include clauses for appropriate disposal of unacceptable material and waste from renovation works. Procurement documents will specify that no environmentally unacceptable or hazardous materials will be used. Bidding documents will include rehabilitation of adequate sanitary facilities, including appropriate disposal of wastewater and sewerage. The environmental management guidelines should be provided to contractors engaged in civil works, and should be made an integral part of the civil works contracts.

When signing renovation contracts, contractors will be asked to adhere to this EMP.

#### 4- Safeguards Considerations

The project have to be in compliance with local environmental rules and regulations, as well as with the environmental policies of the World Bank. The World Bank requires an environmental assessment of any possible environmental impacts of rehabilitation works.

The project would fall to Category B and trigger partial environmental assessment under the Environmental Assessment OP/BP 4.01 safeguard. The safeguard would be triggered due to the minor technical facility and office space renovation works planned under the Component A. The associated environmental impacts and concerns would include dust, noise, safety on site and waste management.

While it is not expected that this project would trigger any safeguard other than OP 4.01 Environmental Assessment, a table of the ten World Bank safeguard policies is presented in the following table. It is the responsibility of the government to ensure that these policies are not violated.

#### *World Bank Safeguard Policies*

<b>Safeguard Policy</b>	<b>Brief Description</b>
Environmental assessment (EA)	WB financed projects must be environmentally sound and sustainable. Type and detail of EA dependent on nature, scale and potential environmental risks.
Natural habitat	The Bank supports the protection, maintenance and rehabilitation of natural habitats and does not support projects that involve the significant conversion or degradation of critical natural habitats.
Forests	Policy triggered whenever a project affects indirectly forest assets.

Pest management	The WB supports the use of biological or environmental control of pests and strategies that reduce the reliance on synthetic chemical pesticides. It supports integrated pest management and the safe use of agricultural pesticides.
Involuntary resettlement	People who have to be removed or who lose their livelihood as a result of the project must be resettled, compensated for all of their losses and they must be provided with a situation that is at least as good as the one from which they came.
Indigenous peoples	Local indigenous people or distinct groups who are marginalized in society who could be adversely affected by the project
Physical cultural resources	WB supports the preservation of physical cultural resources which includes sites with archaeological, paleontological, historical, religious or unique natural values. It seeks to avoid impacts on such sites.
Safety of dams	WB financed new dams must be designed and built under the supervision of competent professionals. Dams over 15 meters in height are of concern particularly if there is a large flood handling requirement or the dam is in a zone of high seismicity and/or where foundations and other design features are complex.
International waterways	Any project that may affect the water quality or quantity of a waterway shared with other nations.
Disputed areas	Projects in disputed areas could affect relations between the country within which the project is being developed and neighboring countries. Disputes would be dealt with at the earliest opportunity.

The project will support the modernization of the Datacenters and the renovation of the office premises to better serve customers. Measures will be taken to ensure that the works meet health, safety and environmental standards.

This EMP will take into account any applicable national environmental legislation and regulations in this regard, such as:

- **Law No. 444/2002** on Environmental Protection
- **Law No. 216/1993 amended by law No. 667/1997** on the establishment of the “Ministry of Environment (MOE)”
- **Law No. 690/2005** amending the mandate of MOE.
- **The Council of Ministers’ decree No. 8633 for 2012** for the application of the Environmental Impact Assessment (EIA)
- **MOE ministerial decision No. 52/1 of 1996** pertaining to the environmental quality standards for air, water and soil as well as **MOE ministerial decision No. 8/1 of 2001** relating to air emission standards and wastewater discharge

## 5- Site Screening and Review

The guidelines cover the handling of renovation debris generated, selection of renovation materials and methods with limited impact on the environment, energy saving methods as well as the handling of remodeling wastes. When selecting suitable renovation methods and materials, great attention should be paid to locally available traditions, skills and resources in the sites.

**A- Sites:** The sites specific screening and review should carefully assess the following issues:

- Dust and noise due to the remodeling works;
- Dumping of remodeling wastes and accidental spillage of machine oil, lubricants, etc.
- Risk from inadequate handling of waste.
- Dust from transportation and handling of remodeling works will be minimized by water and other means such as enclosure of remodeling sites. To reduce noise, renovation will be restricted during certain hours. All debris, remodeling and wood waste will be stored within the work site. Wood waste will be stored separately and arranged to be recycled instead of disposing it. Open burning and illegal dumping will not be permitted. Proper sites for earth/clay and sand disposal will be determined and prior approval from relevant authority for disposal will be obtained. Stockpiling of remodeling debris on site will be avoided and waste will be disposed of on a regular basis at the authorized government dumping ground.
- Debris chutes will be provided to transfer debris from higher floors to the ground. It is necessary to arrange transport and make agreements with relevant organizations involved in waste and renovation debris discharge.

It is also required to create necessary conditions for safe removal of sewage during the rehabilitation and renovation and observe the ecological and sanitary regulations during

the rehabilitation of sanitary and technical equipment, sewage pipes and purifying constructions.

**B- Demolition work:** Existing building elements (walls, foundations, ground cement slabs, etc.) should be carefully demolished and the debris should be sorted and removed as directed by the EMP. All valuable materials (doors, windows, sanitary fixtures, etc) should be carefully dismantled and transported to the storage area assigned for the purpose. Valuable materials should be recycled within the project or sold.

**C- Energy Efficiency, Insulation and Ventilation:** Insulation should be tailored to the seasonal impacts of climate, internal thermal load, and characteristics of exposure.

Windows location should be determined on view, ventilation, light, thermal gain, privacy control and interior space functions.

High-efficiency systems for heating domestic water (including solar systems) and for interior space heating should be selected with maintenance and long term running costs in mind.

Plumbing should be coordinated to minimize plumbing and also water service to toilets, kitchen and utility rooms.

All materials and equipment (to be used) should have a security certificate.

**D- Electrical Systems:** Ground defective wiring near any plumbing fixture is a precaution.

Selecting the most energy-efficient light fixtures, lamps, appliances and equipment will reduce energy demand but can introduce undesirable electromagnetic fields. Be aware that close proximity to table, floor and desk halogen, fluorescent and other high-efficiency fixtures and lamps can cause an exposure to harmful electromagnetic fields.

**E- Cabinetry and Wood:** Nontoxic finishes are available but expensive. Selecting the least toxic finishes is advised. All materials should have appropriate permissions on quality and safety.

**F- Finishes:** Water-based interior nontoxic, no allergenic paint for drywall or plaster surfaces is preferable to latex or oil-based paints from a respiratory standpoint. Any enamel coating for doors or other surfaces that require a more durable finish is advised to be applied away from interior spaces and be fully aired for over a month before installation. Indoor space should not be occupied until odor and toxins of the paint or finish has been adequately aired.

**G- Selection of Renovation Materials and Renovation Methods:** Environmentally sound goods and services should be selected. Priority should be given to products meeting standards for recognized international or national symbols. Traditionally well-tried materials and methods should be chosen before new and unknown techniques. Renovation sites should be fenced off in order to prevent entry of public, and general safety measures would be imposed. Temporary inconveniences due to remodeling works should be minimized through planning and coordination with contractors, neighbors and authorities. In densely populated areas, noisy or vibration generating activities should be strictly confined to the daytime.

## 6- Mitigation Measures Plan

Activity	Parameter	Mitigation Measures Checklist	Monitoring & Frequency
0. General Conditions	Workers Safety	<ul style="list-style-type: none"> <li>- The contractor would formally agree that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment.</li> <li>- Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots)</li> <li>- Appropriate signposting of the sites will inform workers of key rules and regulations to follow.</li> </ul>	<ul style="list-style-type: none"> <li>-Signature of contract</li> <li>- Mitigation Measures included, recorded and reported in bi-weekly audit</li> </ul>
A. Dismantling	Construction debris	<p>Most construction waste is non-hazardous (lime, cement, sand plaster, concrete, glass, ceramics, electrical and mechanical, sanitary pipes, etc.) with the exception of solvents, paints and machines oils.</p> <ul style="list-style-type: none"> <li>- The general specifications in the renovation documents and bill of quantities would include clauses to ensure that these substances are properly disposed of. (the sites for disposal of renovation waste would be government approved sites)</li> </ul>	<ul style="list-style-type: none"> <li>- Waste management recorded and progress and activities reported in bi-weekly audit</li> </ul>
B. General Rehabilitation Activities	Air Quality	<ul style="list-style-type: none"> <li>- During interior demolition debris-chutes shall be used above the first floor</li> <li>- Demolition debris shall be kept in controlled area and sprayed with water mist to reduce debris dust</li> <li>- During pneumatic drilling/wall destruction dust shall be suppressed by ongoing water spraying and/or installing</li> </ul>	<ul style="list-style-type: none"> <li>- Air quality Management measures to included, recorded and reported in bi-weekly audit</li> </ul>

		<p>dust screen enclosures at site</p> <ul style="list-style-type: none"> <li>- The surrounding environment (side-walks, roads) shall be kept free of debris to minimize dust</li> <li>- There will be no open burning of waste material at the site</li> <li>- There will be no excessive idling of construction vehicles at sites</li> </ul>	
	Heating and insulation	<p>Deteriorated or non-existent heating insulation in walls, windows and roofs. High heat losses due to construction flaws, damaged insulation of Windows and walls. Absence of protection from winds.</p> <ul style="list-style-type: none"> <li>- Insulation of construction elements (including walls, windows and roofs).</li> </ul> <p>Reducing heat losses through placement of heated areas and buffer zones. Decreasing heat losses through ventilation by using controlled ventilation principles. Increasing heat preservation by planting trees and façade greenery, which also increases wind protection and heating insulation properties of a building.</p>	
	Noise	<ul style="list-style-type: none"> <li>- Construction/renovation noise will be limited to restricted times agreed to in the permit</li> <li>- During operations the engine covers of generators, air compressors and other powered mechanical equipment shall be closed, and equipment placed as far away from residential areas as possible</li> </ul>	<ul style="list-style-type: none"> <li>- Mitigation Measures for noise are to be included, recorded and reported in bi-weekly audit</li> </ul>
	Water Quality	<ul style="list-style-type: none"> <li>- The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in</li> </ul>	<ul style="list-style-type: none"> <li>-Mitigation Measures for water quality are to be included, recorded and reported in bi-weekly audit</li> </ul>

		nearby streams and rivers.	
	Sanitation	Proper attention and adequate sanitary services for renovation staff (both men and women) during the renovation must be provided. This should include hand-washing facilities.	To be included, recorded and reported in bi-weekly audit
	Waste management	<ul style="list-style-type: none"> <li>- Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and renovation activities.</li> <li>- Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers.</li> <li>- Construction waste will be collected and disposed properly by licensed collectors</li> <li>- The records of waste disposal will be maintained as proof for proper management as designed.</li> <li>- Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)</li> </ul>	Mitigation Measures for waste management are to be included, recorded and reported in bi-weekly audit
C. Individual wastewater treatment system	Water Quality	<ul style="list-style-type: none"> <li>- Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment</li> <li>- Monitoring of new wastewater systems (before/after) will be carried out</li> <li>- Construction vehicles and machinery will be washed only in designated areas where runoff will not pollute natural surface water bodies.</li> </ul>	To be included, recorded and reported in bi-weekly audit
D. Toxic	Toxic /	- Temporarily storage on site of	To be included,

Materials	hazardous waste management	<p>all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information</p> <ul style="list-style-type: none"> <li>- The wastes shall be transported by specially licensed carriers and disposed in a licensed facility.</li> <li>- Paints with toxic ingredients or solvents or lead-based paints will not be used</li> </ul>	recorded and reported in bi-weekly audit
E. Affected forests, wetlands and/or protected areas	Protection	<ul style="list-style-type: none"> <li>- All recognized natural habitats, wetlands and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities.</li> <li>- Adjacent wetlands and streams shall be protected from renovation site run-off with appropriate erosion and sediment control feature to include by not limited to hay bales and silt fences</li> <li>- There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.</li> </ul>	To be included, recorded and reported in bi-weekly audit
F. Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by renovation activities	<p>In compliance with national regulations the contractor will insure that the renovation site is properly secured and renovation related traffic regulated. This includes but is not limited to:</p> <ul style="list-style-type: none"> <li>- Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards</li> <li>- Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for</li> </ul>	To be included, recorded and reported in bi-weekly audit

		<p>pedestrians where construction traffic interferes.</p> <ul style="list-style-type: none"> <li>- Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement</li> <li>- Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public.</li> <li>- Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.</li> </ul>	
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The associated costs for all mitigation measures will be determined in the contractors' contracts.

Costs cannot be estimated until a needs assessment is conducted for each individual site, however costs are estimated not to exceed 2% of each contract amount.

## **Section II- General Safety, Health and Environmental Regulations**

### **1- Introduction**

- 1.1 The prevention of injury and/or illness to site personnel and the public, damage to the works and to public and private property, protection of the environment, and compliance with applicable laws, are primary objectives of the GDLRC, and because of the importance the GDLRC places on meeting these objectives, selected minimum requirements are outlined in these Safety, Health and Environmental Regulations with which contractors shall comply while working on project contracts. Given that these Regulations cannot cover every eventuality, the contractor shall be expected to exercise good judgment in all such matters, even though not mentioned in these Regulations, and shall take any and all additional measures, as required or necessary, to meet his responsibility for safety, health and environmental matters during the period of the Contract.

The GDLRC and its representatives shall not be held liable for any actions taken by the contractor that are attributed to following the minimum requirements stated hereinafter.

- 1.2 The contractor shall, throughout the execution and completion of the remodeling works and the remedying of any defects therein:
- (a) Have full regard for the safety of all persons on the site and keep the site and the works in an orderly state appropriate to the avoidance of danger to any person;
  - (b) Know and understand all laws governing his activities along with any site requirements and work site hazards. Such information shall be communicated by the contractor to his personnel and subcontractors;
  - (c) Take all necessary measures to protect his personnel, the GDLRC's personnel, other persons, the general public and the environment;
  - (d) Avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of carrying out the Works.

### **2- Compliance with Regulations**

- 2.1 The contractor shall comply with the requirements of these Safety, Health and Environmental Regulations and all other applicable regulations or requirements under Lebanese laws, laid down by relevant authorities or issued by the GDLRC concerning safety, health and the environment, in force or introduced or issued from time to time during the period of the contract. In so far as these regulations are applicable, they shall apply to sites and personnel outside the site associated with the performance of the contract.

- 2.2 The regulations equally apply to subcontractors and all other parties engaged by the contractor and their personnel. The contractor shall ensure all such parties are fully aware of and comply with the regulations.
- 2.3 The contractor shall comply with all notifications and written or verbal instruction regarding safety issued pursuant to these regulations by the GDLRC or relevant authorities within the time specified in the notification or instruction.
- 2.4 The contractor shall adopt a positive approach, awareness and responsibility towards safety, health and the environment, and take appropriate action, by:
- (a) Ensuring the regulations are enforced and followed by the contractor's personnel. Any failure by the contractor's personnel to follow the regulations shall be regarded as a failure by the contractor.
  - (b) Paying attention to possible injury to unauthorized persons entering the site, particularly children.
- 2.5 Whenever in these regulations the contractor is required to provide test certificates for equipment and personnel or to comply the relevant authorities' requirements and no independent test facilities are available or no relevant authorities exist in Lebanon, the contractor shall provide:
- (a) In lieu of independent test certificates:  
For equipment -details of the tests and the date of the tests that have been carried out by the contractor and a written statement that the contractor has satisfied himself that the item of equipment is fit and safe for use;  
For personnel-details of the training and experience and a written statement that the contractor has satisfied himself that the person has the required level of competency;
  - (b) In lieu of relevant authorities' requirements-details of the contractor's own rules, regulations, requirements and procedures regarding safety, health and the environment.

### **3-Failure to Comply with Regulations**

#### **3.1 General**

- 3.1.1 Should the contractor fail to comply with any of the regulations or requirements:
- (a) The PIU may suspend the works or part of the works until the contractor has taken necessary steps, to the satisfaction of the GDLRC, to comply with the regulations or requirements.
  - (b) The PIU may, following written notice to the contractor, carry out themselves or arrange for another contractor to carry out such measures, as they consider appropriate on behalf of the contractor. Any such actions by the GDLRC shall not affect or diminish the contractors' obligations or responsibilities under the contract.
  - (c) The PIU may, following written notice to the contractor specifying the breach or breaches of these regulations by the contractor, impose the fines stipulated in Sub-

Clause 3.2.

- (d) The PIU may, by written notice of suspension to the contractor, suspend all payments to the contractor under the contract if the contractor fails to rectify any breach of the Regulations within the period specified by the PIU, provided that such notice of suspension:
- (i) Shall specify the nature of the failure or failures; and
  - (ii) Shall request the contractor to remedy each such failure within a specified period after receipt by the contractors of such notice of suspension. Such suspension of payment will remain in force until such time as the contractor has rectified the breach or breaches. No interest shall be paid on the suspended payments.
- 3.1.2 Failure to comply with the Regulations or requirements shall be considered a breach of contract by the contractor and may result in termination of the Contract by the PIU.
- 3.1.3 In the event of the PIU taking action based on Sub-Clause 3.1.1(a) or (b) or 3.1.2, the contractor shall not be entitled to any additional costs or extension to the Contract Completion Date.
- 3.1.4 All costs incurred by the PIU pursuant to Sub-Clause 3.1.1 (b) and the fines imposed on the contractor under Sub-Clause 3.1.1 (c) shall be deducted from amounts otherwise due to the contractor.

## 3.2 Fines

- 3.2.1 Failures by the contractor to comply with the regulations or requirements are classified as follows:

F1 - breaches of Sub-Clause 5.1 (personal protective equipment);  
F2 - breaches other than F1.

- 3.2.2 The basic fine for each classification in Sub-Clause 3.2.1, is as follows:

For F1-US\$ 100;  
For F2-US\$ 200

- 3.2.3 Fines will be applied as follows:

- (a) For the first breach of each regulation or requirement -the basic fine. If the same or similar breaches occur in different situations or locations at the same time, the PIU may apply fines for each situation or location; this will not apply to breaches related to personal protective equipment.
- (b) For a second or subsequent breach of the same Regulation or requirement or failure to rectify a previous failure within the time specified by the PIU twice the basic fine.

## **4- General Requirements**

### **4.1 Preamble**

4.1.1 All references to safety shall be deemed to include health and the environment.

### **4.2 Safety Monitoring**

4.2.1 The PIU shall make regular safety inspections of the work site and shall include a section concerning the results in its periodical reports. The section shall include details of all breaches of these regulations and any other matters or situations relating to safety found during the inspection and actions taken by the contractor.

### **4.3 Control of Substances Hazardous to Health**

4.3.1 Hazardous materials shall be stored in approved safety containers and handled in a manner specified by the manufactures and/or prescribed by relevant Authorities (see Sub-Clause 2.5).

4.3.2 Only properly trained and equipped personnel shall handle hazardous materials.

### **4.4 Potential Hazards**

4.4.1 The contractor shall inform employees of potential hazards, take appropriate steps to reduce hazards and be prepared for emergency situations.

4.4.2 The contractor shall make an assessment of every operation involving hazardous substances. The assessment shall be recorded on a Hazardous and Flammable Substances Assessment Method Statement, which shall be submitted to the PIU prior to the delivery and use of the substance on Site.

### **4.5 Accident Reporting**

4.5.1 The contractor shall report all accidents and dangerous occurrences to the PIU. A reportable accident or dangerous occurrence shall include any accident to any person on site requiring medical attention or resulting in the loss of working hours or any incident that resulted, or could have resulted, in injury, damage or a danger to the works, persons, property or the environment.

4.5.2 In the event of an accident or dangerous occurrence, the contractor shall be responsible for completing all statutory notifications and reports. Copies of all statutory notifications and reports shall be passed to the PIU.

4.5.3 The contractor shall immediately rectify any situation or condition that could result in injury, damage or a danger to the works, person, property or the environment. If the situation or condition cannot be corrected immediately, the contractor shall provide temporary barriers and appropriate warning signs and

devices and/or take other appropriate action necessary for the protection of persons, property and the environment.

#### **4.6 Notices, Signs, etc.**

4.6.1 All safety, health, environmental and other notices and signs shall be clearly displayed and written in both Arabic and English. All requirements, instructions, procedures, etc issued by the contractor concerning these regulations shall be printed in both Arabic and English and displayed and readily available to contractor's personnel.

#### **4.7 First Aid and Medical Attention**

4.7.1 The contractor shall have comprehensive First Aid Kit(s) on Site at all times. First Aid Kits shall be conveniently located and clearly identifiable.

4.7.2 The contractor shall make contingency arrangements for calling a doctor and transporting injured persons to hospital. The telephone numbers of the emergency services and the name address and telephone number of the doctor and nearest hospital shall be prominently displayed in the contractor's site office.

4.7.3 The contractor shall employ only persons who are fit, qualified and skilled in the work to be performed. All persons shall be above the minimum working age.

#### **4.8 Employee Qualifications and Conduct**

The contractor shall ensure:

(a) That no firearms, weapons, controlled or illegal substances or alcoholic beverages are brought onto the Site and that no personnel under the influence of alcohol or drugs are permitted on site.

(b) That all personnel obey warning signs, product or process labels and posted instructions.

(c) That drivers or operators of vehicles, machinery, plant and equipment follow the rules for safe operations. Drivers shall wear seat belts and obey all signs and posted speed limits.

### **5- Safety Requirements**

#### **5.1 Personal Protective Equipment**

5.1.1 The contractor shall provide personal protective equipment, including hard hats, safety glasses, respirators, gloves, safety shoes, and such other equipment as required, and shall take all measures or actions for the protection and safety of contractor's personnel.

5.1.2 Non-metallic hard hats shall be worn at all times by all personnel at the worksite with the exception of those areas where it is not necessary to do so.

- 5.1.3 Safety glasses shall meet international standards and be available for use and worn in specified worksite areas. As a minimum, safety glasses shall be worn for the following types of work: hammering, chipping, welding, grinding, use of electrically powered or pneumatic equipment, insulation handling, spray painting, working with solvents, and other jobs where the potential of an eye injury exists. Face shields and/or mono-goggles shall be worn where possible exposure to hazardous chemicals, cryogenic fluids, acids, caustics, or dust exists and where safety glasses may not provide adequate protection.
- 5.1.4 When handling acids, caustics, and chemicals with corrosive or toxic properties, suitable protection, such as acid suits or chemical resistant aprons and gloves, shall be worn to prevent accidental contact with the substance.
- 5.1.5 Personnel shall not be permitted to work whilst wearing personal clothing or footwear likely to be hazardous to themselves or others.
- 5.1.6 The wearing of safety shoes with steel reinforced toes is recommended for all contractor's personnel on site. In all cases, contractor's personnel shall wear substantial work shoes that are commensurate with the hazards of the work and the worksite area.
- 5.1.7 Hearing protection, including muffs, plugs or a combination thereof, shall be provided for all personnel operating in areas where the noise level exceeds 90 decibels. Such protection shall also be provided for operators working with equipment exceeding such a level. This may include equipment such as excavators, shovels, jackhammers, saws, drills, grinders, and the like are being used.
- 5.1.8 The contractor shall encourage employees to wear substantial work gloves whenever practical and safe to do so.

## **5.2 Fire Protections and Prevention**

- 5.2.1 The contractor shall comply with fire protection instructions given by the Authorities having jurisdiction in regard to fire protection regulations.
- 5.2.2 The contractor shall, upon moving on site, provide to the Authorities a fire prevention and evacuation plan. This shall include drawing(s) showing the fire assembly points. The fire prevention and evacuation plan and drawing(s) shall be updated from time to time as the Works progress. The Contractor shall ensure all personnel are fully informed on escape routes and assembly points and any changes thereto.
- 5.2.3 Fuel storage will not be permitted in renovated work areas. Contractors may establish fuel storage tanks in special areas set aside for the purpose. Storage tanks shall be adequately bonded to control spillage. Fire extinguishers shall be provided

and installed in a suitable nearby location.

- 5.2.4 Highly combustible or volatile materials shall be stored separately from other materials and as prescribed by relevant authorities and under no circumstances within buildings or structures forming part of the permanent Works. All such materials shall be protected and not exposed to open flame or other situations, which could result in a fire risk.
- 5.2.5 All temporary accommodation and stores shall be provided with smoke detectors and fire alarms.
- 5.2.6 Smoking shall be banned in high-risk areas.
- 5.2.7 Expanded polystyrene with or without flame retarding additive, polythene, cardboard and hardboard shall not be used as protection materials.
- 5.2.8 Plywood and chipboard shall only be used as protection on floors. Vertical protection shall be non-combustible. Debris netting and weather protection sheeting shall be fire retardant.
- 5.2.9 When using cutting or welding torches or other equipment with an open flame, the contractor shall provide a fire extinguisher close by at all times. All flammable material shall be cleared from areas of hot works, or work locations prior to welding or oxy/gas burning operations. All hot works shall cease half an hour before the end of a work shift to allow for thorough checking for fires or smoldering materials. Where appropriate, areas of hot works are to be doused in water before the shift ends.
- 5.2.10 An adequate number of fire extinguishers of types suited to the fire risk and the materials exposed shall be provided. These shall be placed in accessible, well marked locations throughout the job site. Contractor's personnel shall be trained in their use. Extinguishers shall be checked monthly for service condition and replaced or recharged, as appropriate after use.
- 5.2.11 Only approved containers shall be used for the storage, transport and dispensing of flammable substances. Portable containers used for transporting or transferring gasoline or other flammable liquids shall be approved safety cans.
- 5.2.12 Fuel burning engines shall be shut off while being refueled.
- 5.2.13 Adequate ventilation to prevent an accumulation of flammable vapors shall be provided where solvents or volatile cleaning agents are used.
- 5.2.14 Flammables shall not be stored under overhead pipelines, cable trays, electrical wires, or stairways used for emergency egress.
- 5.2.15 Paints shall be stored and mixed in a room assigned for the purpose. This room shall be kept under lock and key.

5.2.16 Oily waste, rags and any other such combustible materials shall be stored in proper metal containers with self-closing lids and removed every night to a safe area or off site. Every precaution shall be taken to prevent spontaneous combustion.

### **5.3 Electrical Safety**

5.3.1 All temporary electrical installations, tools and equipment shall comply with current regulations dealing with on-site electrical installations.

5.3.2 The contractor shall establish a permit-to-work system for work on or in proximity to energized circuits of any voltage. Contractor's personnel shall not commence work on such circuits unless a permit to work has been issued and adequate safety measures have been taken.

5.3.3 Only authorized personnel shall be allowed to work or repair electrical installations and equipment.

5.3.4 Portable tools and equipment shall be 220 volt.

5.3.5 When portable or semi-mobile equipment operates at voltages in excess of 110 volts, the supply shall be protected by a Residual Current Device (RCD) regardless of any such device fitted to the equipment. The RCD must have a tripping characteristic of 30 milliamps at 30 milliseconds maximum.

5.3.6 All static electrically powered equipment, including motors, transformers, generators, welders, and other machinery, shall be properly earthed, insulated, and/or protected by a ground fault interruption device. In addition, the skin of metal buildings and trailers with electric service shall be earthed. Metal steps, when used, shall be securely fixed to the trailer.

5.3.7 Lamp holders on festoon lighting shall be molded to flexible cable and be of the screw in type. Clip on guards shall be fitted to each lamp unit.

5.3.8 All tungsten-halogen lamps shall be fitted with a glass guard to the element. These lamps must be permanently fixed at high level.

5.3.9 Electrical equipment shall be periodically inspected and repaired as necessary by competent persons.

5.3.10 any work on electrical equipment and systems shall be made safe through locking, tagging, and/or isolation of the equipment before work commences. Prior to the start of the work, the equipment or systems shall be tested to insure that they have been properly de-energized and isolated.

5.3.11 Electrical repair work on energized systems shall be avoided whenever possible.

5.3.12 Unauthorized personnel shall not enter enclosures or areas containing high voltage equipment such as switchgear, transformers, or substations.

## **5.4 Oxygen/Acetylene/Fuel Gases/Cartridge Tools**

- 5.4.1 Compressed oxygen shall never be used in the place of compressed air.
- 5.4.2 Flash-back (Spark) arresters shall be fitted to all gas equipment.
- 5.4.3 Liquid Petroleum Gas (LPG) cylinders shall not be stored or left in areas below ground level overnight. Cylinders must be stored upright.
- 5.4.4 The quantity of oxygen, acetylene and LPG cylinders at the point of work "shall be restricted to a maximum of one day's supply. Cylinders shall be kept in upright vertical rack containers or be safely secured to a vertical support.
- 5.4.5 Cartridge tools shall be of the low velocity type. Operators must have received adequate training in the safe use and operation of the tool to be used.

## **5.5 Scaffolding/Temporary Works**

- 5.5.1 No aluminum tube shall be used, except for proprietary mobile towers.
- 5.5.2 Drawings and calculations shall be submitted to the PIU and GDLRC, prior to commencement of work on site, for all temporary works, false work, tower hoists, services and scaffolding. Design shall conform to international standards.
- 5.5.3 The contractor shall inspect and approve all temporary works after erection and before access, loading or use is allowed. Completed and approved temporary works shall be tagged with a scaff-tag or similar safety system and the Safe Structure insert displayed. For scaffolding, one tag shall be displayed every 32 m<sup>2</sup> of face area. A central record system shall be kept on all temporary work. Temporary Works shall be inspected weekly and similarly recorded.
- 5.5.4 All mobile scaffold towers shall be erected in accordance with the manufacture's instructions and a copy of these shall be submitted to the PIU prior to any use on site. Additionally, all towers shall be erected complete with access ladder, safety rails and kick boards whatever the height.
- 5.5.5 The contractor shall repair or replace, immediately, any scaffold including accessories, damaged or weakened from any cause.
- 5.5.6 The contractor shall ensure that any slippery conditions on scaffolds are eliminated as soon as possible after they occur.
- 5.5.7 All scaffolds used for storing materials, for brick or block laying, for access to formwork or for any other purpose where materials may accidentally fall, shall be provided with wire mesh guards or guards of a substantial material, in addition to kick boards.

## 5.6 Use of Ladders

- 5.6.1 Manufactured ladders shall meet the applicable safety codes for wood or metal ladders. Metal ladders shall not be used where there is any likelihood of contact with electric cables and equipment. All metal ladders shall be clearly marked: "Caution- Do not use around electrical equipment".
- 5.6.2 Job made ladders shall not be permitted.
- 5.6.3 Extension or straight ladders shall be equipped with non-skid safety feet, and shall be no more than 12 m in height. The maximum height of a stepladder shall be 2 m. Ladders shall not be used as platforms or scaffold planks.
- 5.6.4 Ladders rungs and steps shall be kept clean and free of grease and oil.
- 5.6.5 Extension and straight ladders shall be tied off at the top and/or bottom when in use. Only one person shall be allowed on a ladder at a time.
- 5.6.6 Defective ladders shall be taken out of service and not used. Ladders shall not be painted and shall be inspected for defects prior to use.

## 5.7 Elevated Work

- 5.7.1 The contractor shall provide all personnel, while working at an elevated position, with adequate protection from falls.
- 5.7.2 The contractor shall carry out daily inspections of all elevated work platforms. Defects shall be corrected prior to use.
- 5.7.3 Roofing & Sheet Material Laying
- (a) A Method Statement detailing the procedures to be adopted shall be submitted to and agreed with the PIU prior to commencement of work on site.
  - (b) Mobile elevating work platforms or the equivalent shall be used to install roofing and sheet materials wherever practicable and a suitable base is available.
- 5.7.4 Erection of Structures
- (a) A Method Statement detailing the procedures to be adopted shall be submitted and agreed with the PIU prior to commencement of work on site.
  - (b) Safety harnesses and lines shall be provided by the contractor for use by the erection personnel and worn at all times.
  - (c) Mobile elevating work platforms or the equivalent shall be used to erect structures wherever practicable and a suitable base is available.

### 5.7.5 Mobile Elevating Work Platforms

Operators shall be trained in the safe use of such platforms and hold a current Certificate of Competence (see Sub-Clause 2.5).

#### 5.7.6 Hoists

- (a) A copy of the current Test Certificate (see Sub-Clause 2.5) shall be submitted to the PIU before any hoist (personnel or material) is brought into operation on the site. Where the range of travel is increased or reduced a copy of the revised Test Certificate shall be submitted.
- (b) Each landing gate shall be fitted with a mechanical or electrical interlock to prevent movement of the hoist when any such gate is in the open position.
- (c) Safety harnesses must be worn and used by personnel erecting, altering and dismantling hoists.

#### 5.7.7 Suspended Cradles

- (d) Suspended cradles shall be installed, moved and dismantled by a specialist contractor.
- (e) Suspended cradles shall comply with local regulations.
- (f) All powered suspended cradles shall incorporate independent safety lines to over speed braking devices and independent suspension lines for personal safety harness attachment.

### 5.8 Use of Temporary Equipment

- 5.8.1 The safe design capacity of any piece of equipment shall not be exceeded, nor shall the equipment be modified in any manner that alters the original factor of safety or capacity.
- 5.8.2 Mobile equipment shall be fitted with suitable alarm and motion sensing devices, including backup alarm, when required.
- 5.8.3 The contractor shall ensure that the installation and use of equipment are in accordance with the safety rules and recommendations laid down by the manufacturer, taking into account the other installations already in place or to be installed in the future.
- 5.8.4 The contractor shall inspect Equipment prior to its use on the works and periodically thereafter to ensure that it is in safe working order. Special attention shall be given to such items as cables, hoses, guards, booms, blocks, hooks and safety devices. Equipment found to be defective shall not be used and immediately removed from service, and a warning tag attached.
- 5.8.5 Natural and synthetic fiber rope made of material such as manila, nylon, polyester, or polypropylene shall not be used as slings.
- 5.8.6 Only trained, qualified and authorized personnel shall operate equipment. All drivers and operators shall hold a current Certificate of Training Achievement for the equipment being used (see Sub-Clause 2.5).
- 5.8.7 A safety observer shall be assigned to watch movements of heavy mobile equipment where hazards may exist to other personnel from the movement of such

equipment, or where equipment could hit overhead lines or structures. The observer shall also ensure that people are kept clear of mobile equipment and suspended loads.

- 5.8.8 When mobile or heavy equipment is traveling onto a public thoroughfare or roadway, a flagman shall insure that traffic has been stopped prior to such equipment proceeding. While the mobile or heavy equipment is traveling on a public roadway, a trailing escort vehicle with a sign warning of a slow-moving vehicle that is dangerous to pass shall be provided.

### **5.9 Locking-out, Isolating, and Tagging of Equipment**

5.9.1 Equipment that could present a hazard to personnel if accidentally activated during the performance of installation, repair, alteration, cleaning, or inspection work shall be made inoperable and free of stored energy and/or material prior to the start of work. Such equipment shall include circuit breakers, compressors, conveyors, elevators, machine tools, pipelines, pumps, valves, and similar equipment.

5.9.2 Where equipment is subject to unexpected external physical movement such as rotating, turning, dropping, falling, rolling, sliding, etc., mechanical and/or structural constraints shall be applied to prevent such movement.

5.9.3 Equipment which has been locked-out, immobilized, or taken out of service for repair or because of a potentially hazardous condition shall be appropriately tagged indicating the reason it has been isolated and/or taken out of service.

5.9.4 Where safety locks are used for locking out or isolating equipment, the lock shall be specially identified and easily recognized as a safety lock.

### **5.10 Installation of Temporary or Permanent Equipment**

5.10.1 During installation and testing the contractor's specialist engineer shall be in attendance.

5.10.2 All control mechanism panel and wiring diagrams shall be available and printed in both Arabic and English.

### **5.11 Laser Survey Instruments**

5.11.1 Details of the types and use of laser instruments shall be submitted and agreed with the PIU.

### **5.12 Demolition**

5.12.1 A detailed Method Statement detailing the demolition procedures/techniques to be used shall be submitted to and approved by the PIU prior to commencement of work on site.

5.12.2 The Method Statement must include full details of measures to be taken to ensure that there are no persons remaining in the building/structure and to distance members of the public and contractor's personnel from the building/structure prior to demolition.

### **5.13 Concrete Reinforcement Starter Bars**

5.13.1 The contractor shall ensure concrete reinforcement starter bars are not a danger to personnel.

## **6- Environmental and Health Requirements**

### **6.1 Protection of the Environment**

6.1.1 The contractor shall be knowledgeable of and comply with all environmental Laws, rules and regulations for materials, including hazardous substances or wastes under his control. The contractor shall not dump, release or otherwise discharge or dispose of any such material.

6.1.2 Any release of a hazardous substance to the environment, whether air, water or ground, must be reported to the PIU immediately. When releases resulting from contractor action occur, the Contractor shall take proper precautionary measures to counter any known environmental or health hazards associated with such release. These would include remedial procedures such as spill control and containment and notification of the proper authorities.

### **6.2 Air Pollution**

6.2.1 The contractor, depending on the type and quantity of materials being used, may be required to have an emergency episode plan for any releases to the atmosphere. The Contractor shall also be aware of local ordinances affecting air pollution.

6.2.2 The contractor shall take all necessary measures to limit pollution from dust and any wind blown materials during the Works, including damping down with water on a regular basis during dry climatic conditions.

6.2.3 The contractor shall ensure that all trucks leaving the Site are properly covered to prevent discharge of dust, rocks, sand, etc.

### **6.3 Water Pollution**

6.3.1 The contractor shall not dispose of waste solvents, petroleum products, toxic chemicals or solutions in the city drainage system or watercourse, and shall not dump or bury garbage on the Site. These types of waste shall be taken to an approved disposal

facility regularly, and in accordance with requirements of relevant Authorities. The Contractor shall also be responsible to control all runoffs, erosion, etc.

## 6.4 Solid Waste

### 6.4.1 General Housekeeping

(a) The contractor shall maintain the site and any ancillary areas used and occupied for performance of the Works in a clean, tidy and rubbish-free condition at all times.

(b) Upon the issue of any Taking-Over Certificate, the Contractor shall clear away and remove from the Works and the Site to which the Taking-Over Certificate relates, all Contractor's Equipment, surplus material, rubbish and Temporary Works of every kind, and leave the said works and site in a clean condition. Provided that the contractor shall be entitled to retain on Site, until the end of the Defects Liability Period, such materials, Contractor's Equipment and Temporary Works as are required by him for the purpose of fulfilling his obligations during the Defects Liability Period.

### 6.4.2 Rubbish Removal and Disposal

(a) The contractor shall comply with statutory and municipal regulations and requirements for the disposal of rubbish and waste.

(b) The contractor shall provide suitable metal containers for the temporary storage of waste.

(c) The contractor shall remove rubbish containers from site as soon as they are full. Rubbish containers shall not be allowed to overflow.

(d) The Contractor shall provide hard standings for and clear vehicle access to rubbish containers.

(e) The contractor shall provide enclosed chutes of wood or metal where materials are dropped more than 7 meters. The area onto which the material is dropped shall be provided with suitable enclosed protection barriers and warning signs of the hazard of falling materials. Waste materials shall not be removed from the lower area until handling of materials above has ceased.

(f) Domestic and biodegradable waste from offices, canteens and welfare facilities shall be removed daily from the site.

(g) Toxic and hazardous waste shall be collected separately and be disposed of in accordance with current regulations.

(h) No waste shall be burnt on site.

## 6.5 Noise Control

- 6.5.1 The contractor shall ensure that the work is conducted in a manner so as to comply with all restrictions of the Authorities having jurisdiction, as they relate to noise.
- 6.5.2 The contractor shall, in all cases, adopt the best practicable means of minimizing noise. For any particular job, the quietest available plant/and or machinery shall be used. All equipment shall be maintained in good mechanical order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable. Stationary noise sources shall be sited as far away as possible from noise-sensitive areas, and where necessary acoustic barriers shall be used to shield them. Such barriers may be proprietary types, or may consist of site materials such as bricks or earth mounds as appropriate.
- 6.5.3 Compressors, percussion tools and vehicles shall be fitted with effective silencers of a type recommended by the manufacturers of the equipment. Pneumatic drills and other noisy appliances shall not be used during days of rest or after normal working hours without the consent of the GDLRC.
- 6.5.4 Areas where noise levels exceed 90 decibels, even on a temporary basis, shall be posted as high noise level areas.